2C11

Business economics and entrepreneurship

Claudiu Albulescu

Lecture 1: Trends and challenges for the construction industry (28/04/2014)

European Erasmus Mundus Master Course
Sustainable Constructions
under Natural Hazards and Catastrophic Events
520121-1-2011-1-CZ-ERA MUNDUS-EMMC

Universitatea Politehnica Timişoara

LIST OF LECTURES

Lectures

L1 Trends and challenges for the construction industry
L2 Business strategies and business development in construction companies
L3 Financial management in construction companies
L4 Project management – generalities
L5 Project management – support activities
L6 Project management systems applied in constructions
L7 Entrepreneurship issues
L8 Standard contracts in civil engineering
L9 Risk management in construction company
L10 Summary and discussion of the exam questions

Applications

A1 General presentation of the case study (WTP – Hunedoara)
A2 Financial analysis and management in construction company (WTP – Hunedoara)
A3 Cash flow analysis (WTP – Hunedoara)
A4 Visit – WTP Hunedoara
A5 Project's presentation

L1 TRENDS AND CHALLENGES FOR THE CONSTRUCTION INDUSTRY

OBJECTIVES

- **Student understands how the recent global crisis affected the construction industry**

- **Student acquires information about housing prices in EU countries**

- **Student is familiar with recent trends in construction, related to design and construction sustainability**

L1 TRENDS AND CHALLENGES FOR THE CONSTRUCTION INDUSTRY

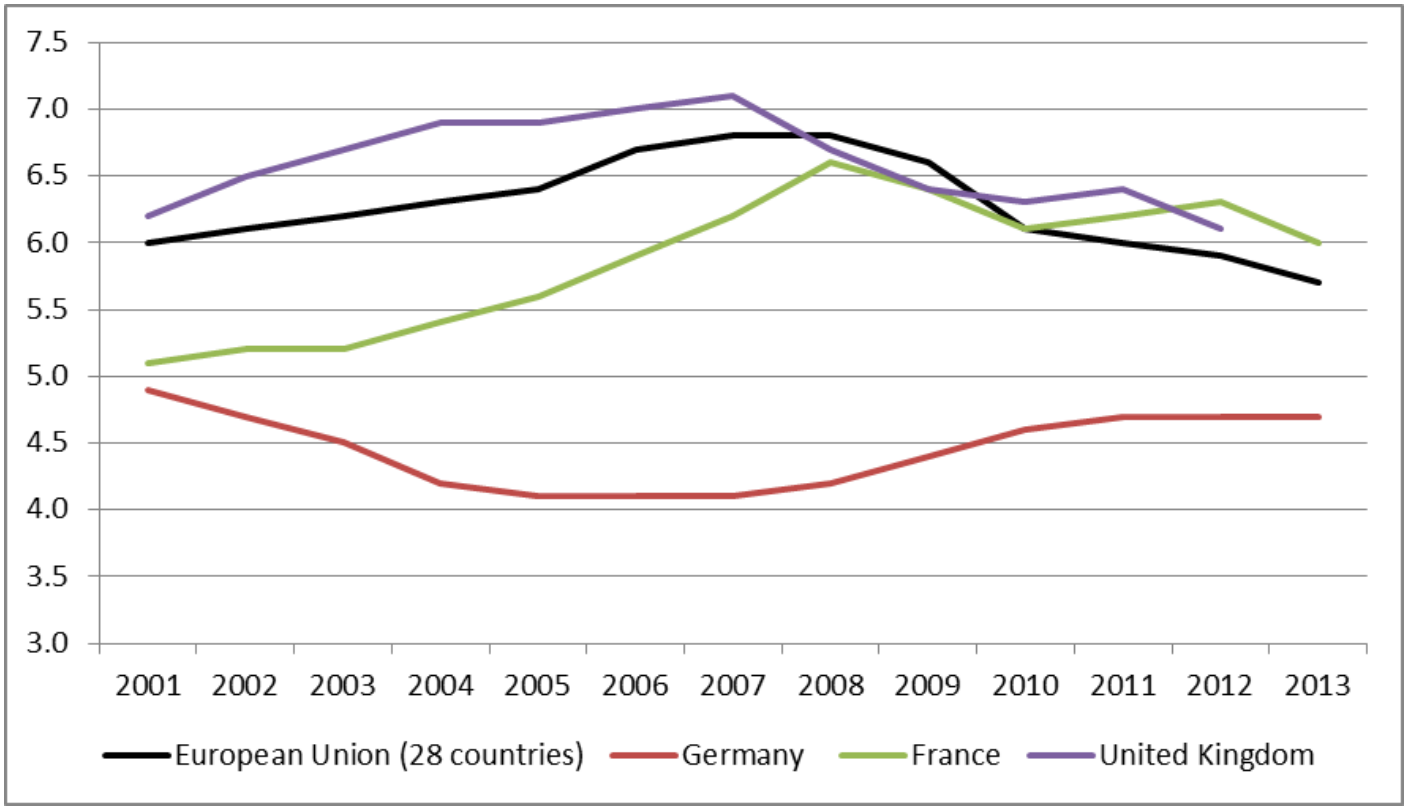
TOPICS - Construction Industry Trends

- CONSTRUCTION IMPORTANCE IN GDP
- THE CRISIS AND THE CONSTRUCTION SECTOR
- EMPLOYMENT IN CONSTRUCTION SECTOR
- HOUSING PRICES
- ARCHITECTS/ENGINEERS/DESIGNERS
- CONSTRUCTION INDUSTRY SUSTENABILITY
- GLOBALIZATION AND CONSTRUCTION INDUSTRY

CONSTRUCTION IMPORTANCE IN GDP

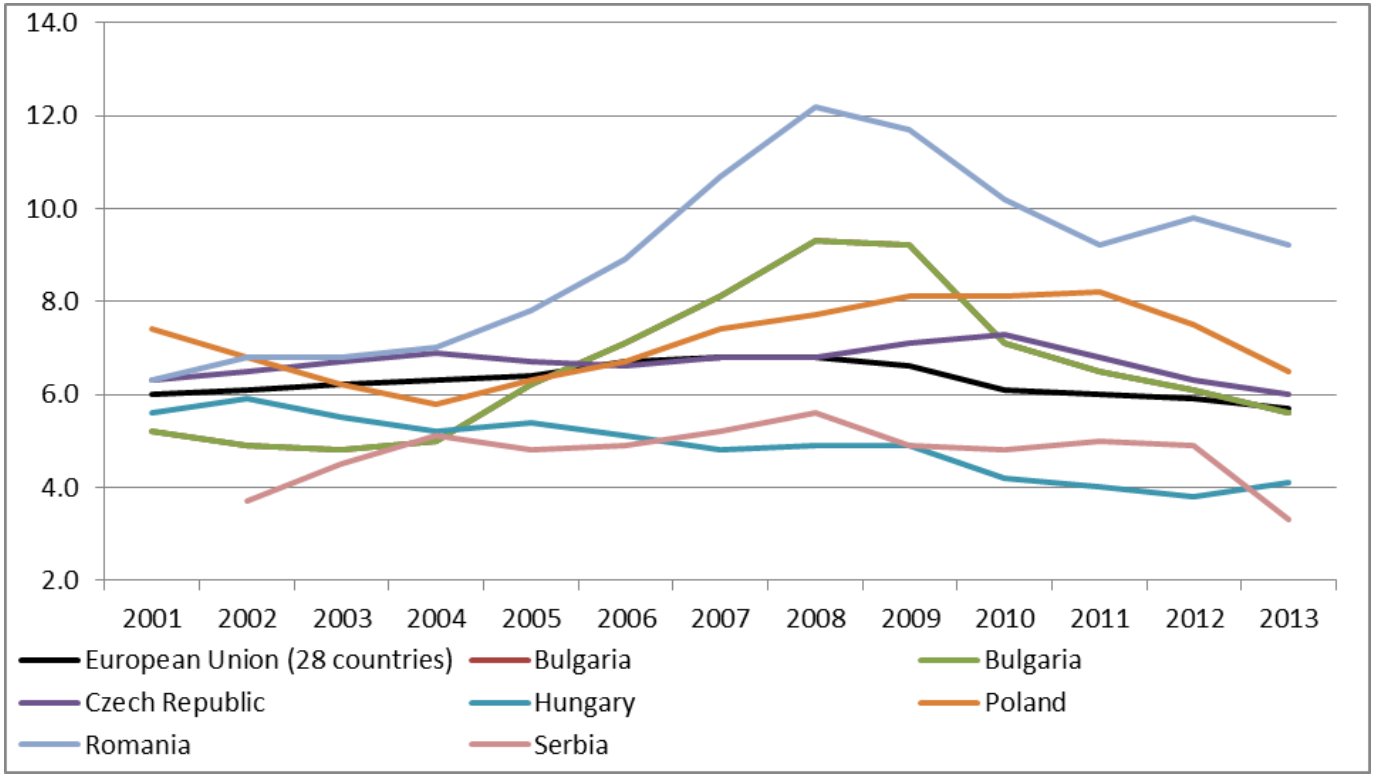
- **Gross Domestic Product (definition)**

- **Construction/GDP (%) – EU core countries**



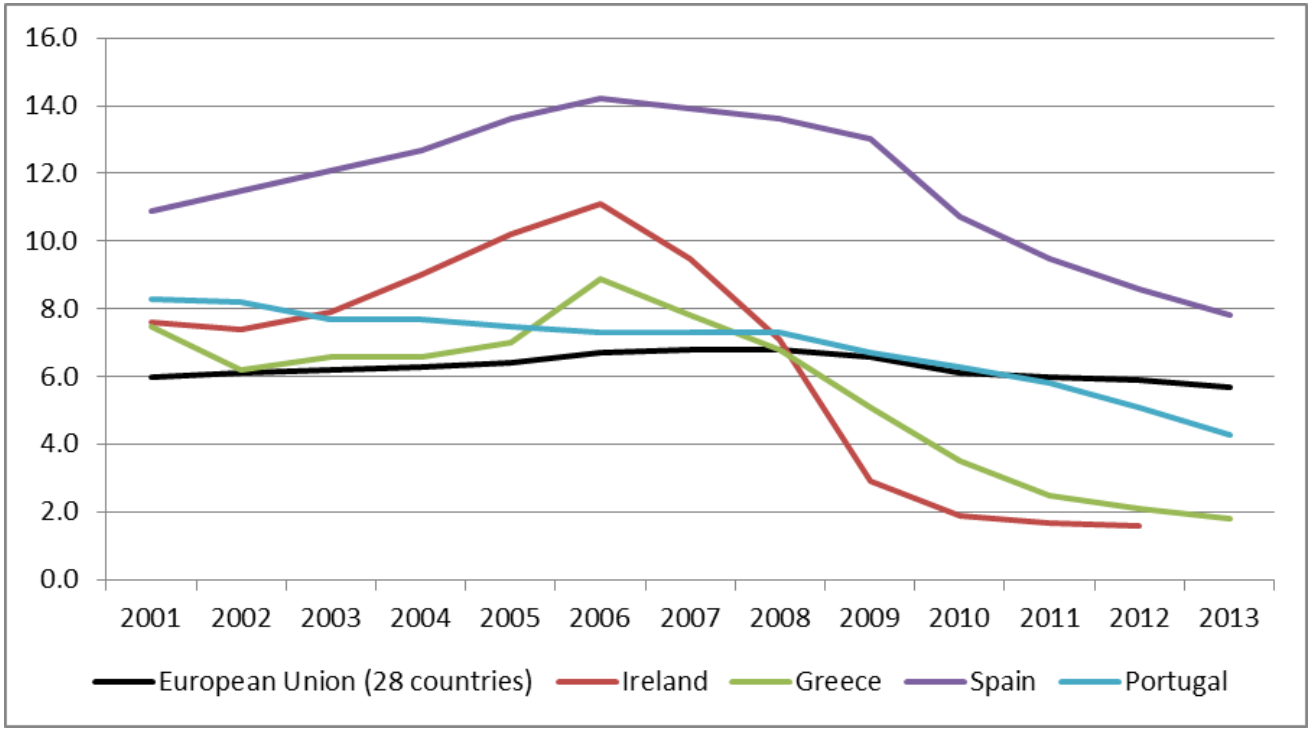
CONSTRUCTION IMPORTANCE IN GDP

- **Construction/GDP (%) – CEE countries**



CONSTRUCTION IMPORTANCE TO GDP

- **Construction/GDP (%) – PIGS countries**

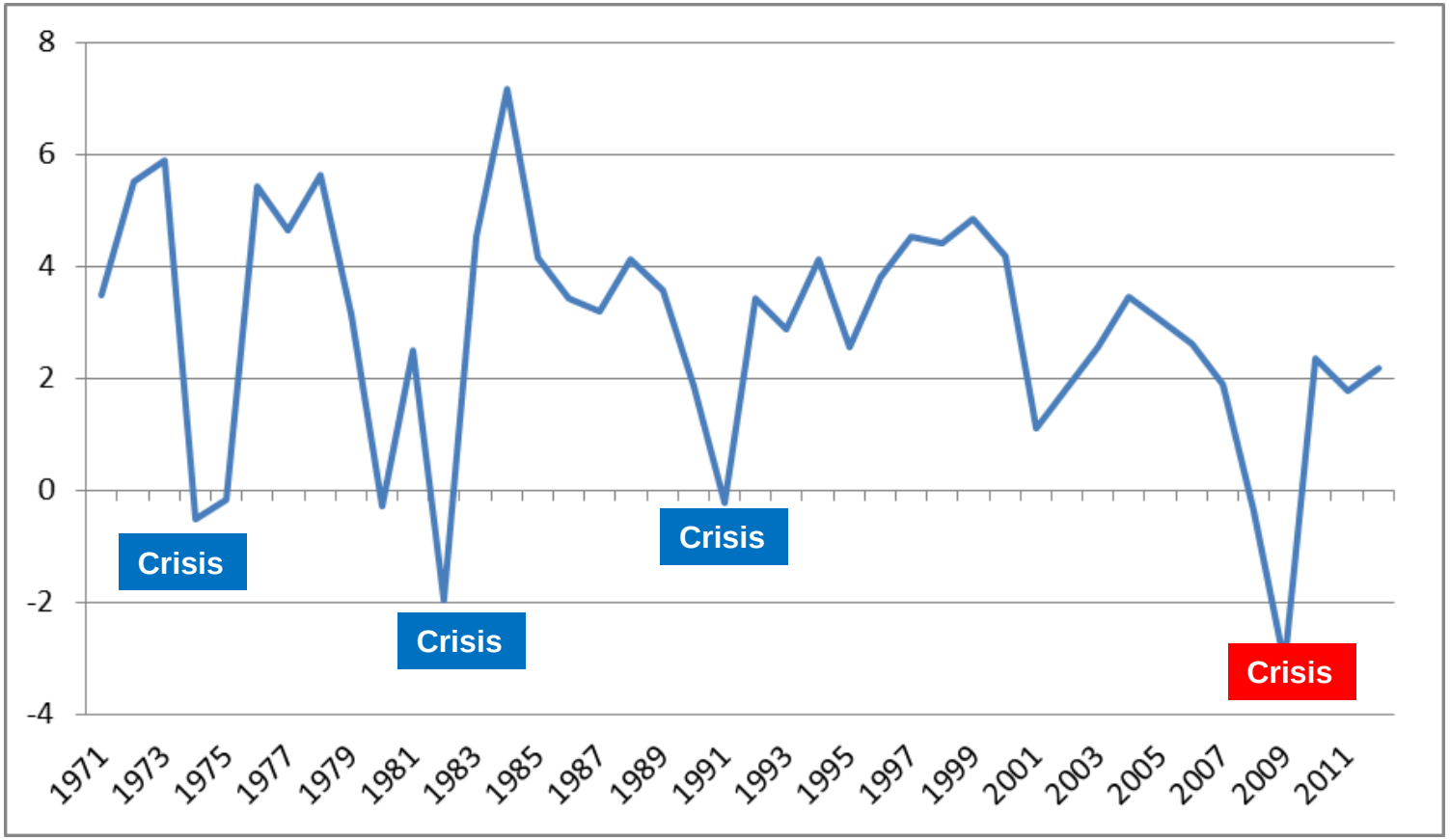


THE CRISIS AND THE CONSTRUCTION SECTOR

GDP – volume (US)

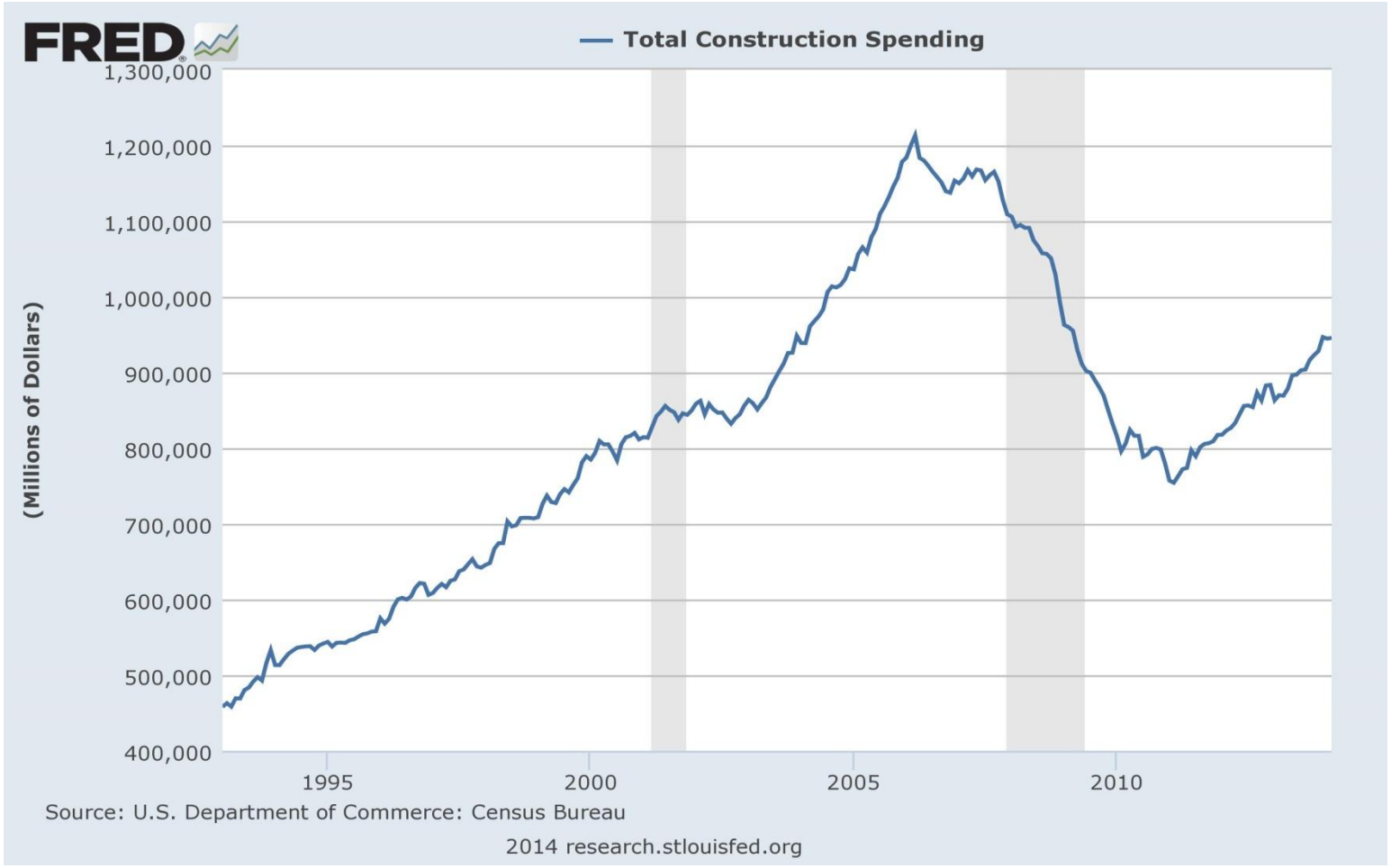
THE CRISIS AND THE CONSTRUCTION SECTOR

GDP growth rate - (US)



THE CRISIS AND THE CONSTRUCTION SECTOR

US Construction Spending (All/Private/Public)



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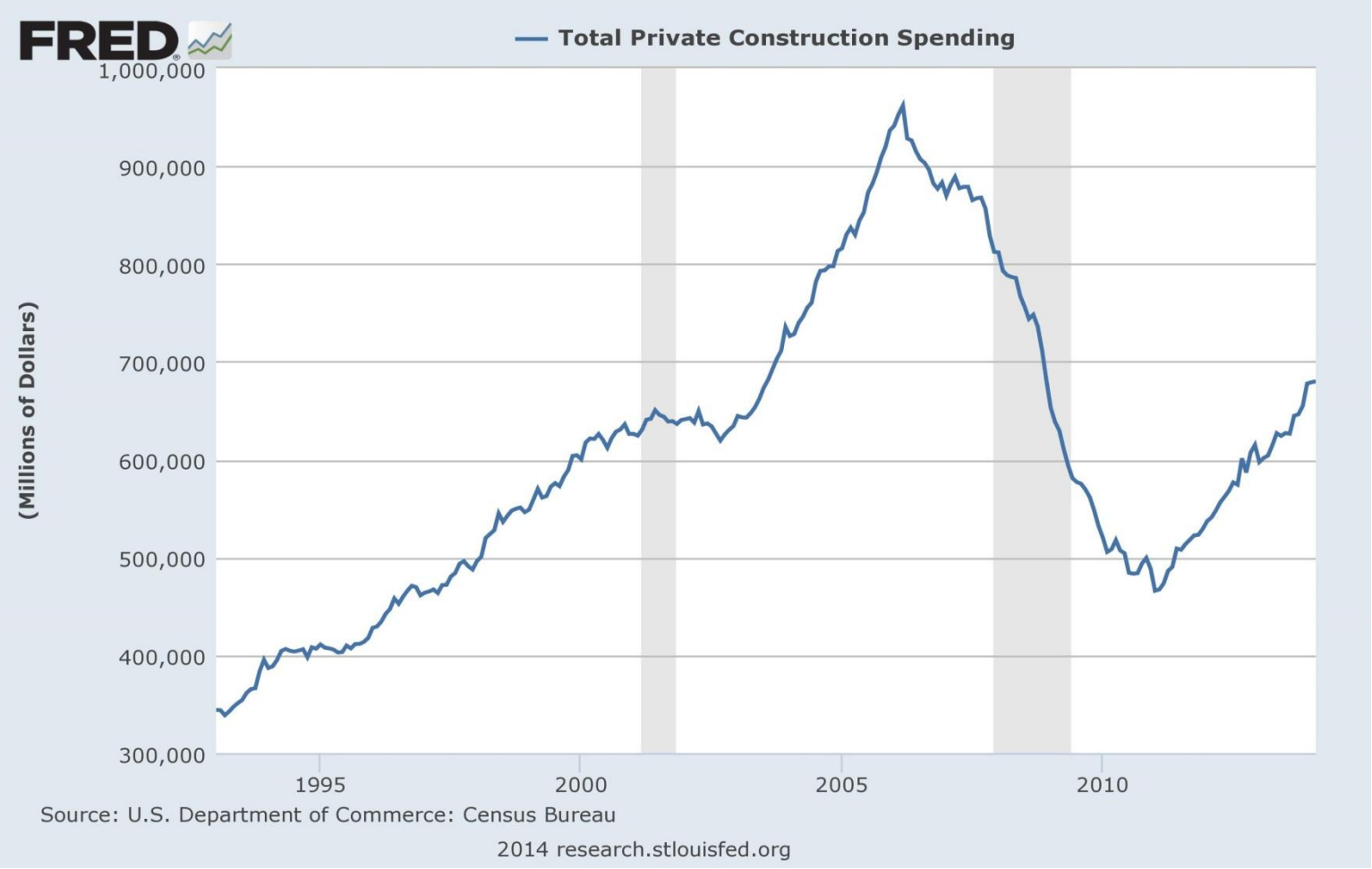

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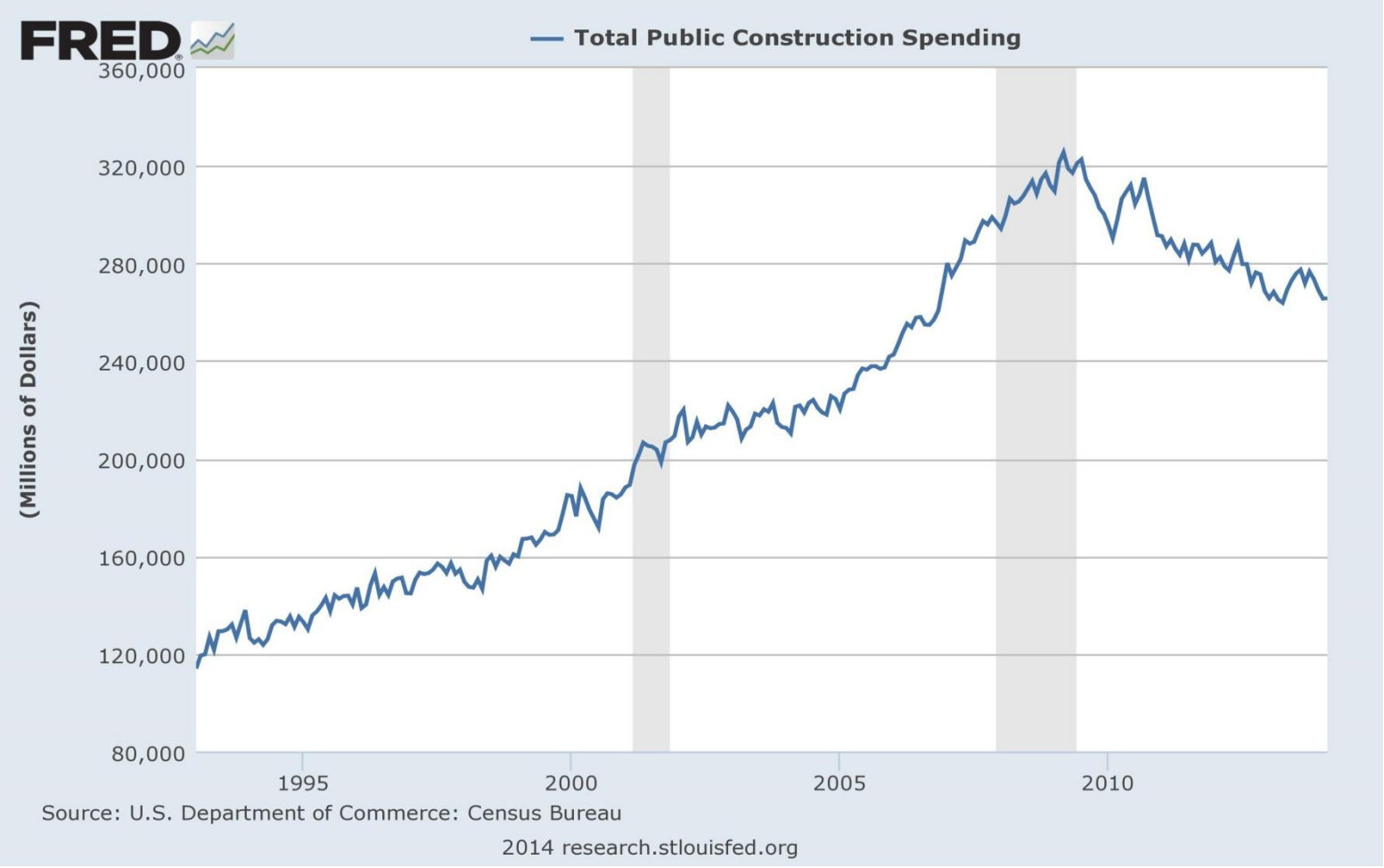
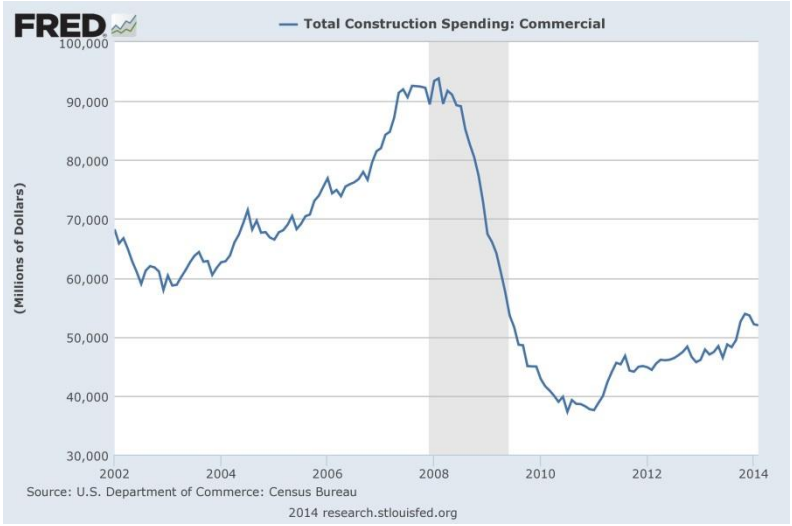
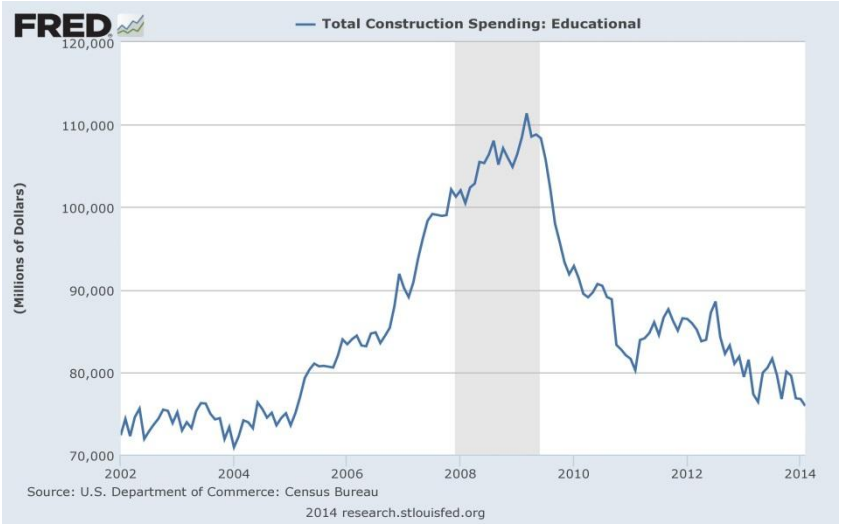
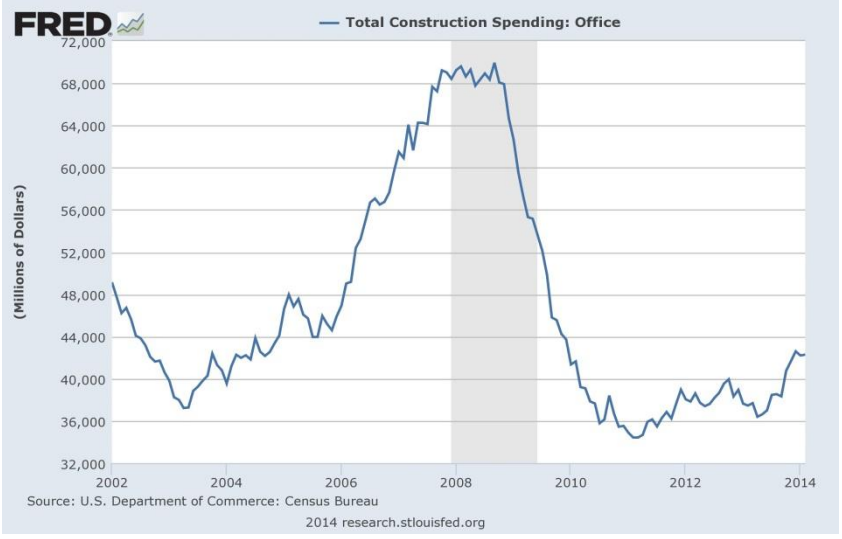


THE CRISIS AND THE CONSTRUCTION SECTOR

US Construction Spending by Sectors







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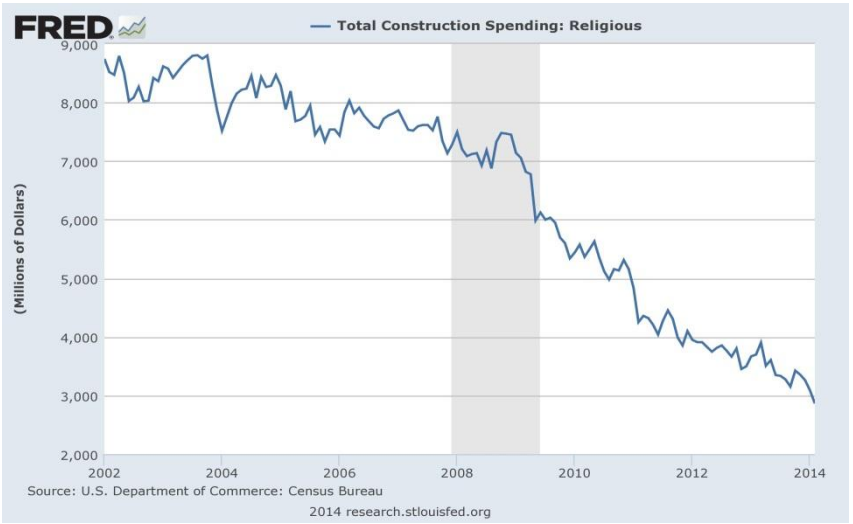
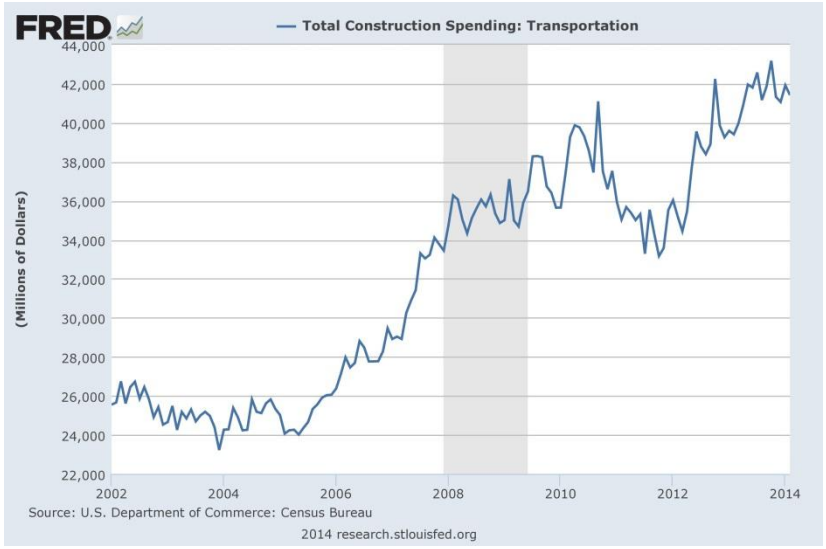
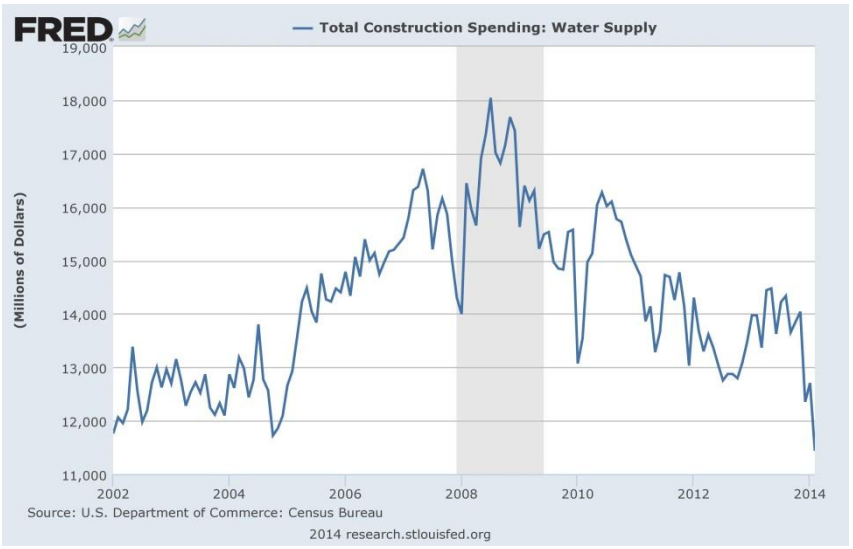
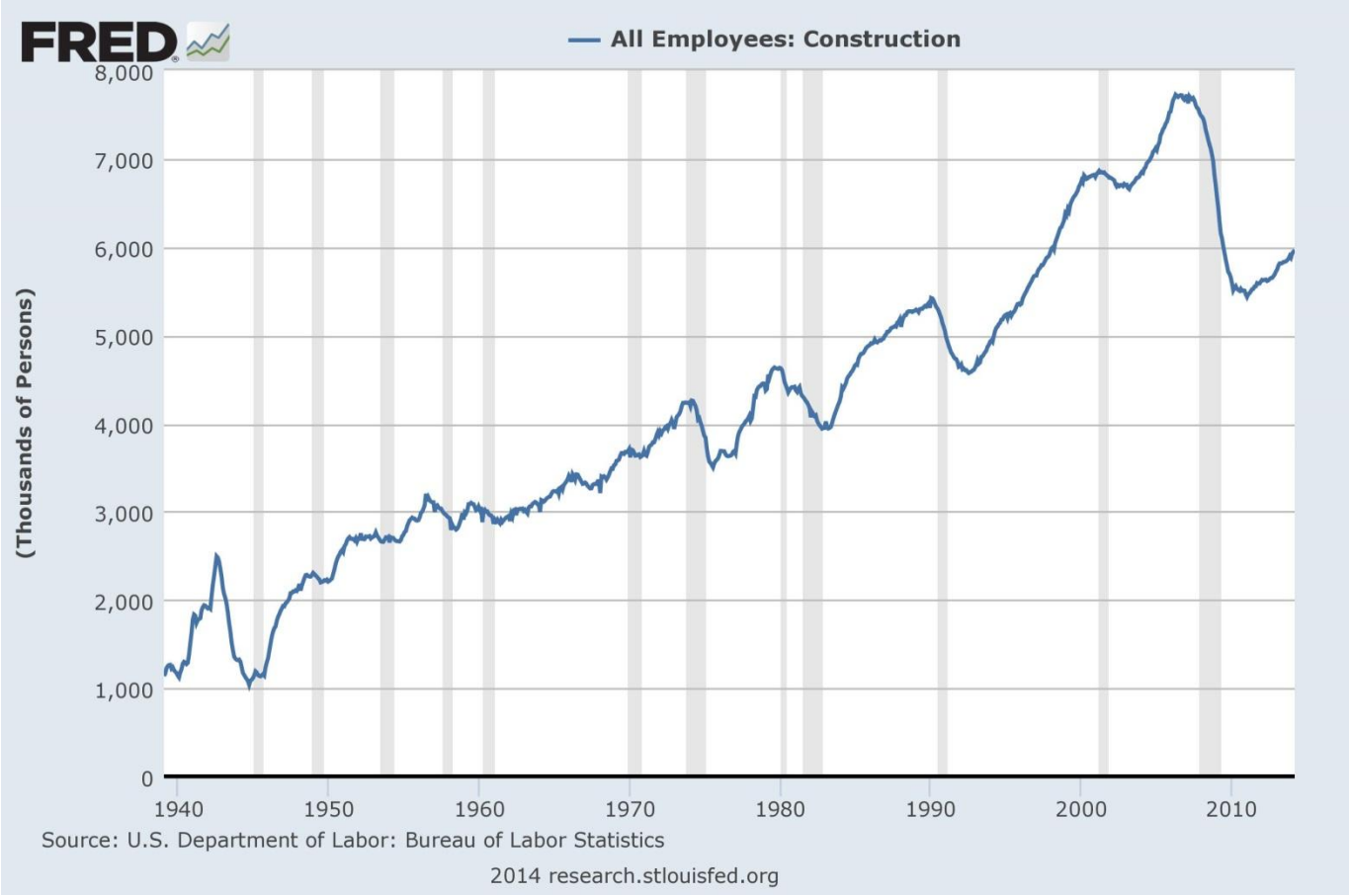






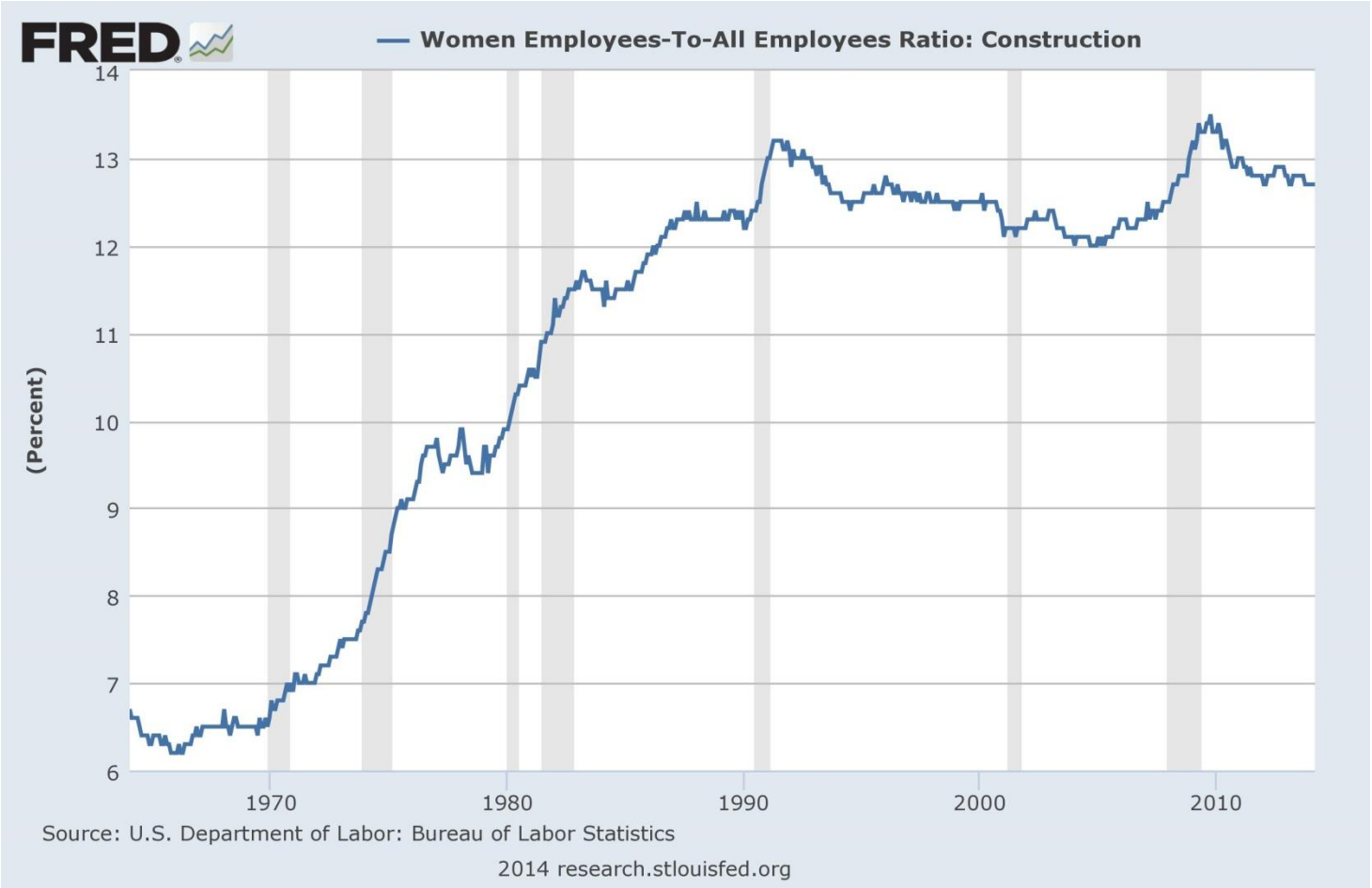
EMPLOYMENT IN CONSTRUCTION SECTOR

Total number of employees in the construction sector (US)



EMPLOYMENT IN CONSTRUCTION SECTOR

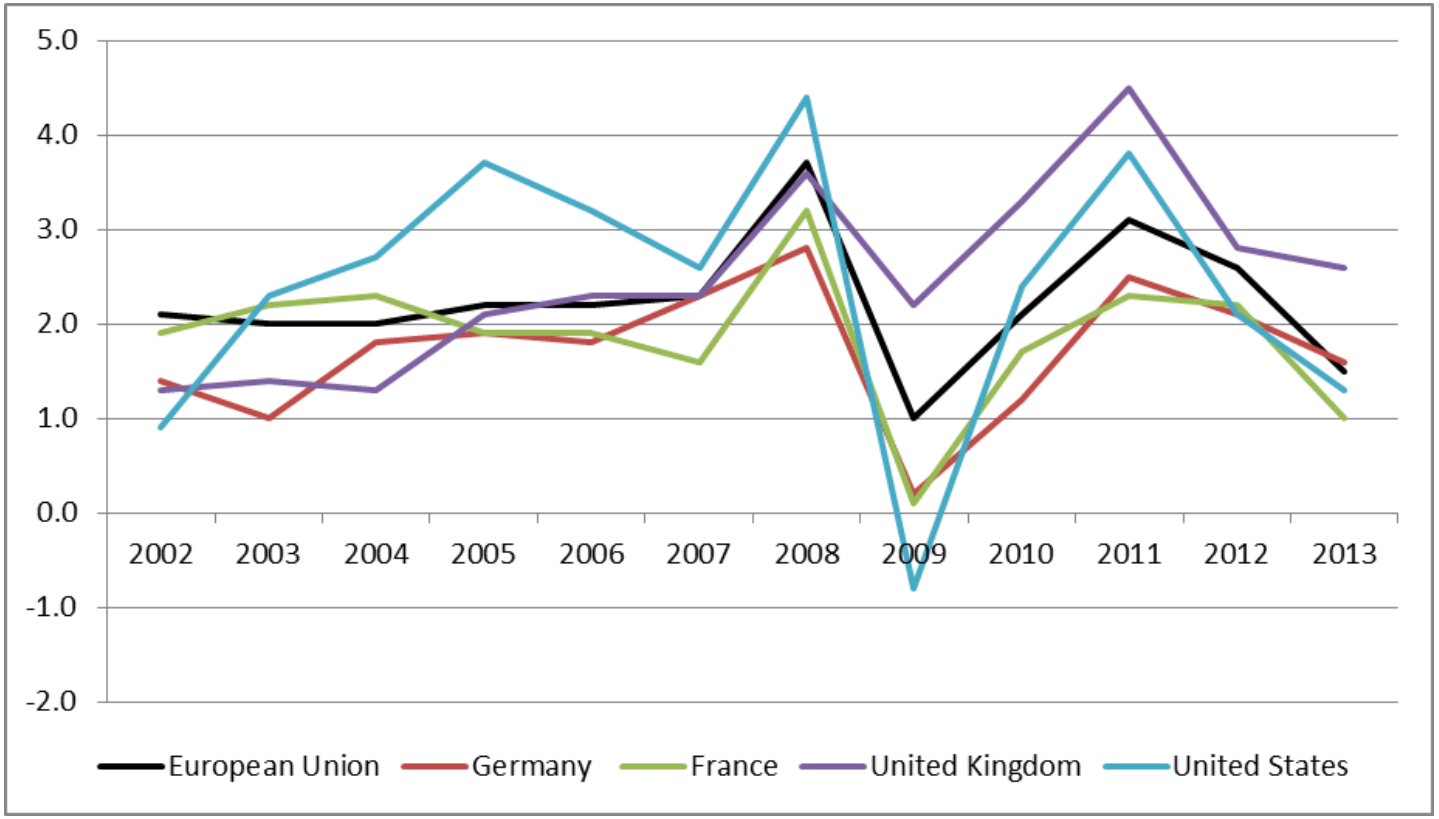
Women employees in the construction sector - % of total number (US)



HOUSING PRICES

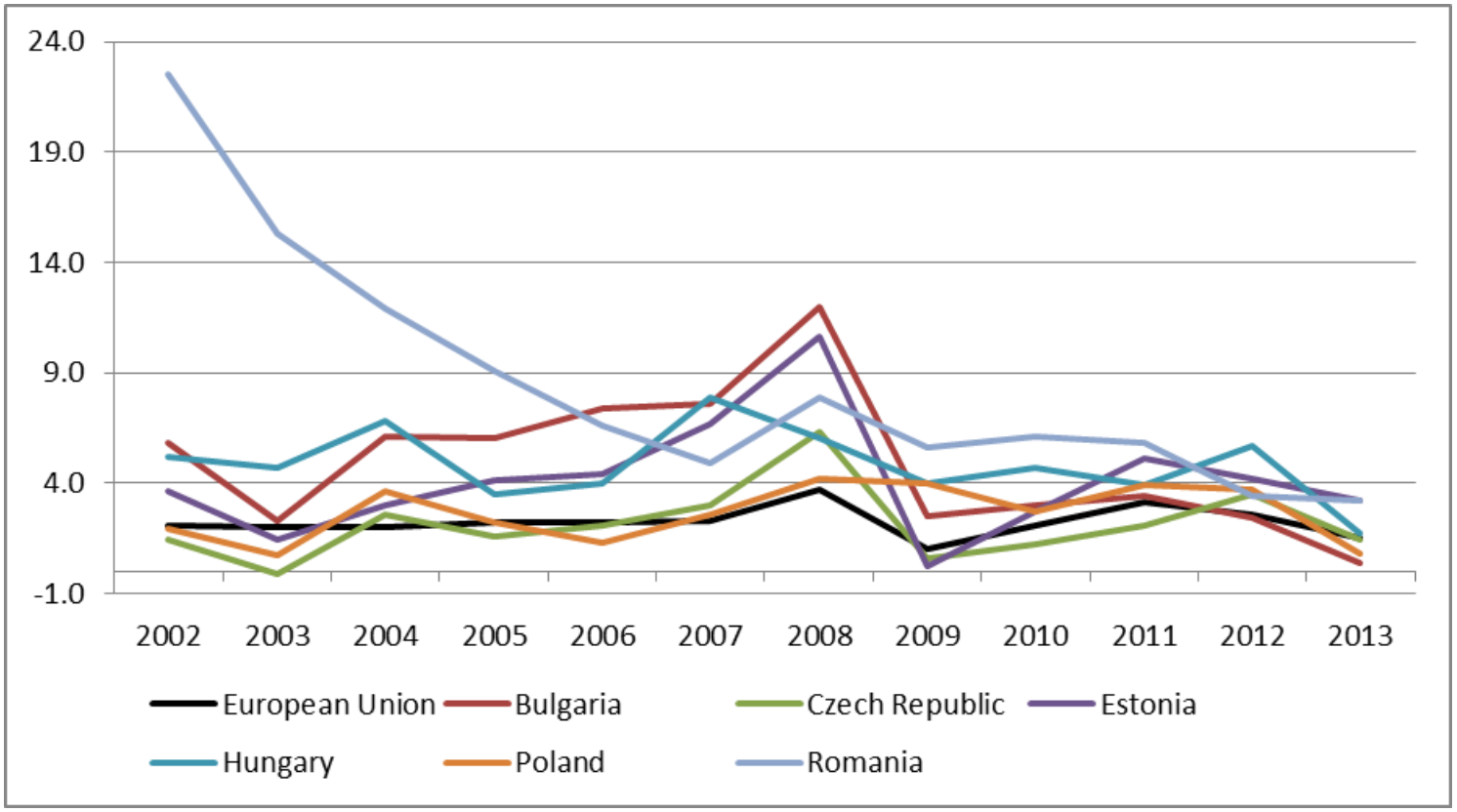
- **Inflation (definition)**

- **Inflation (EU core countries and US)**



HOUSING PRICES

- **Inflation (CEE countries)**



HOUSING PRICES

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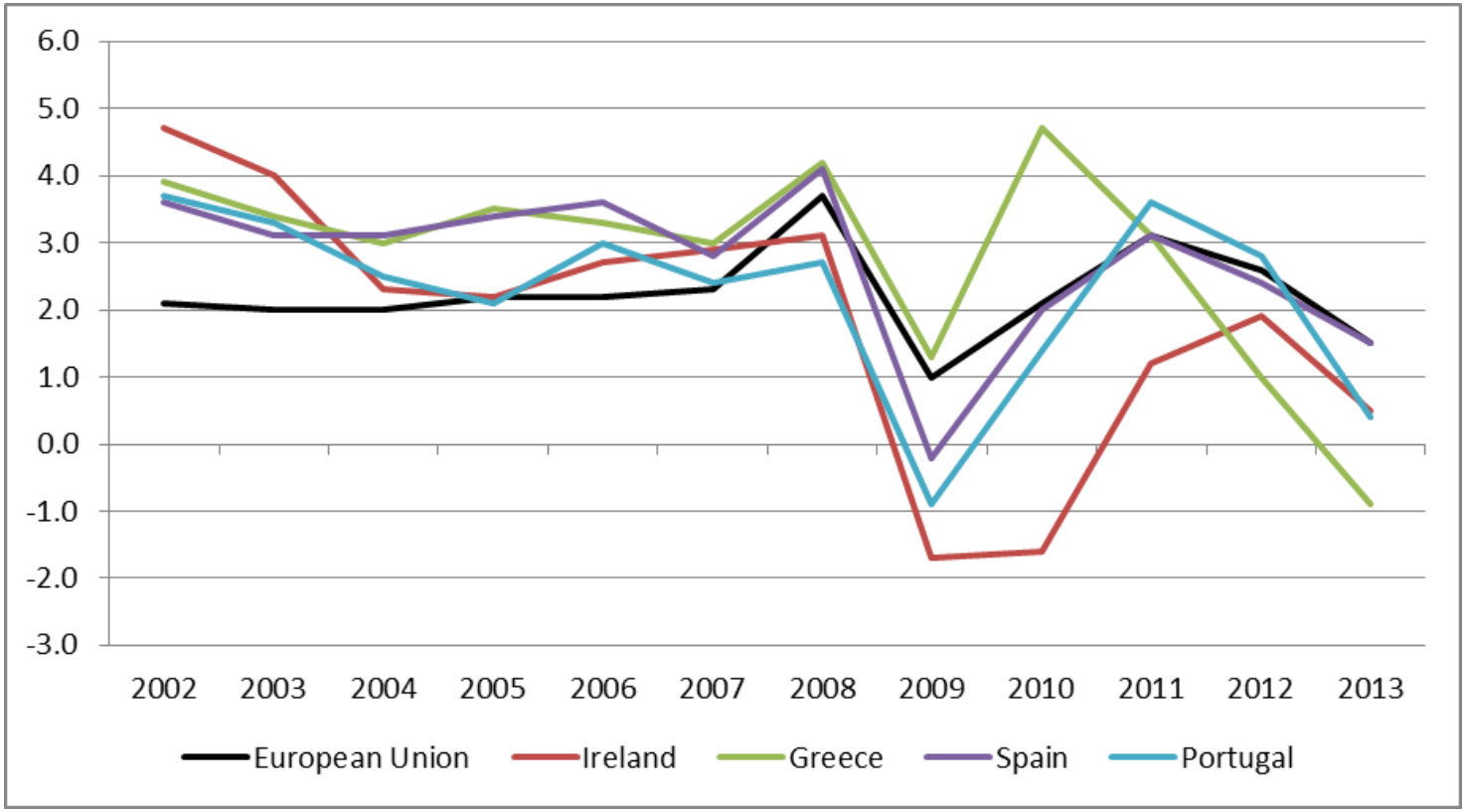
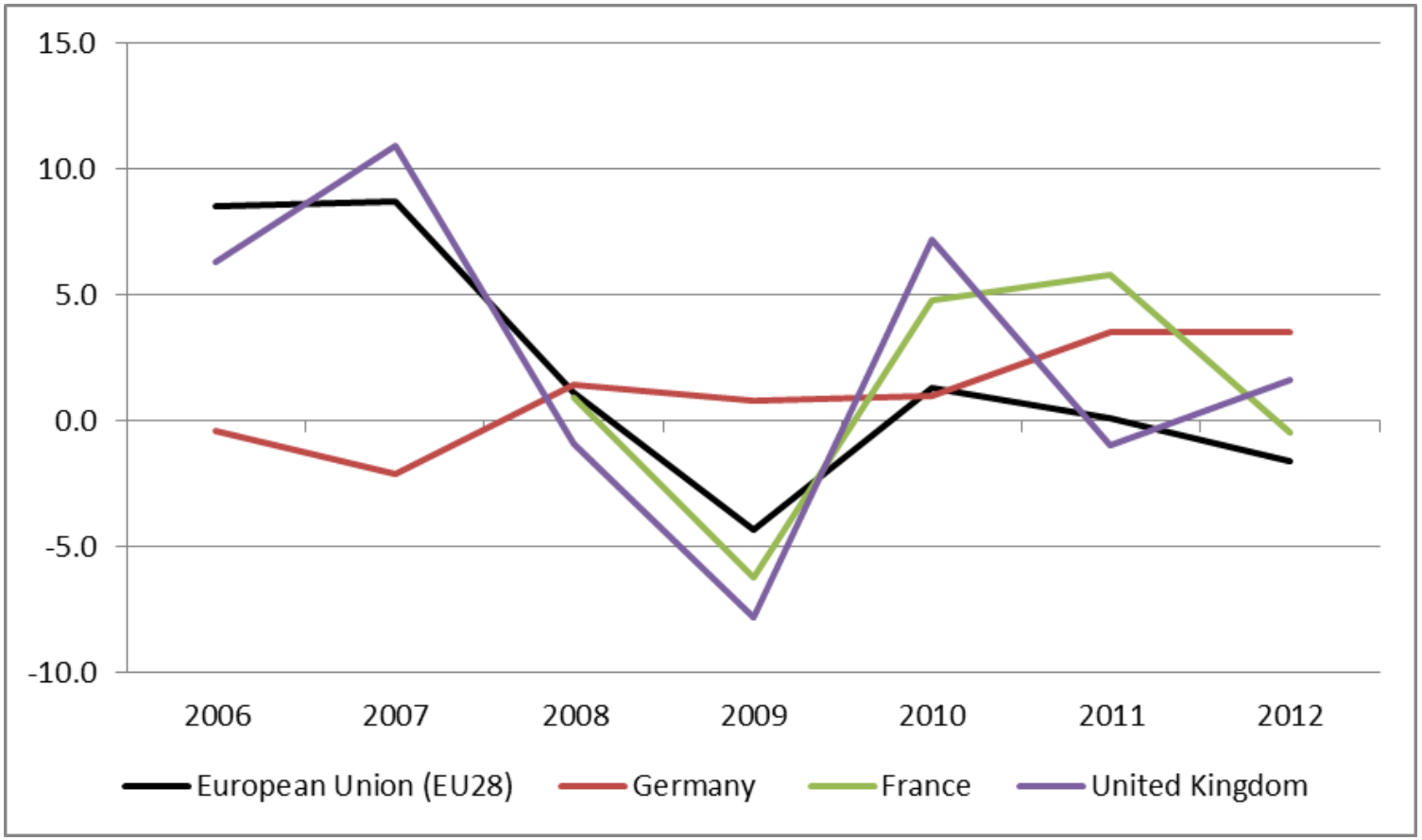


HOUSING PRICES

- **Housing prices (EU core countries)**



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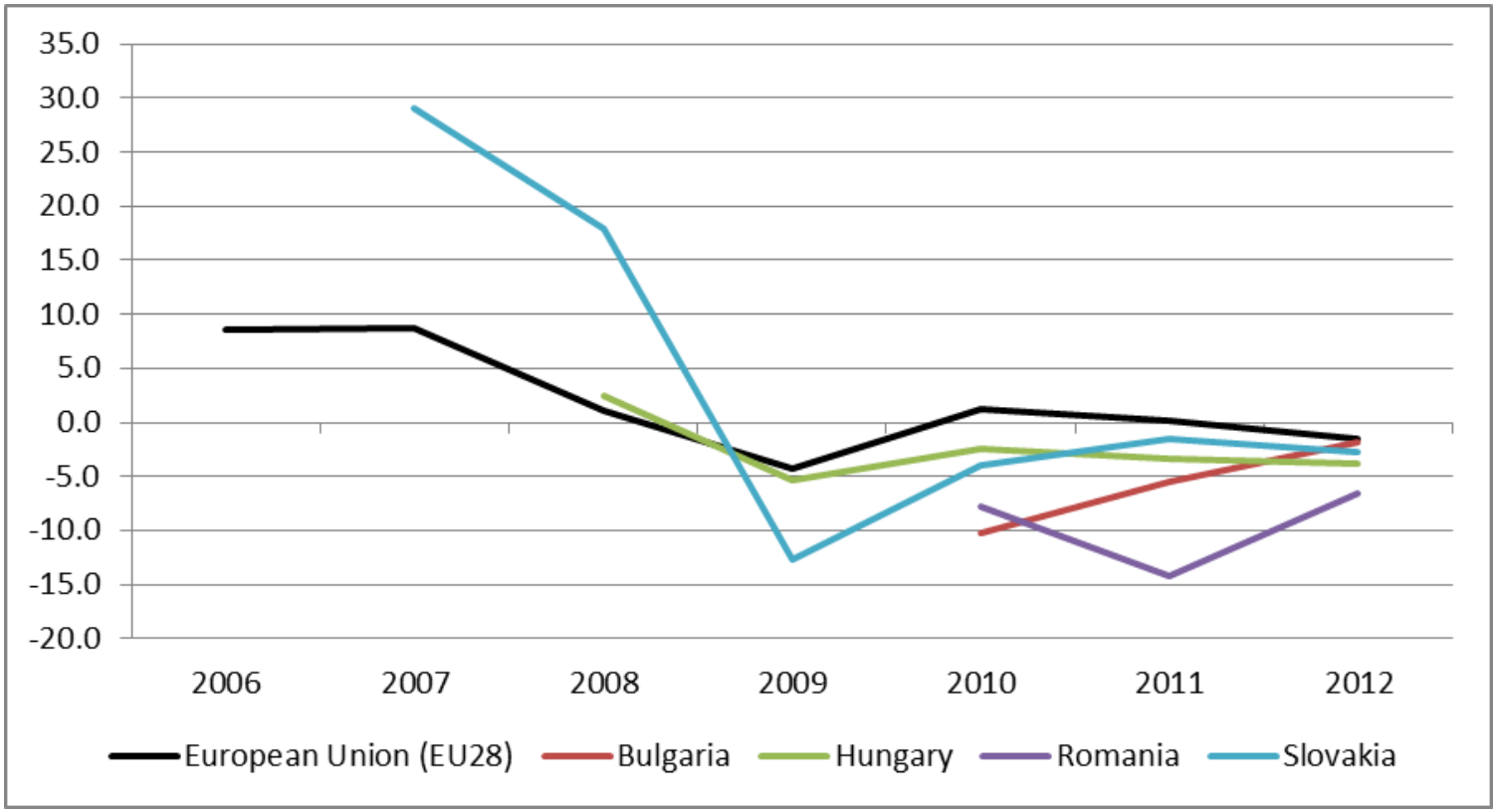

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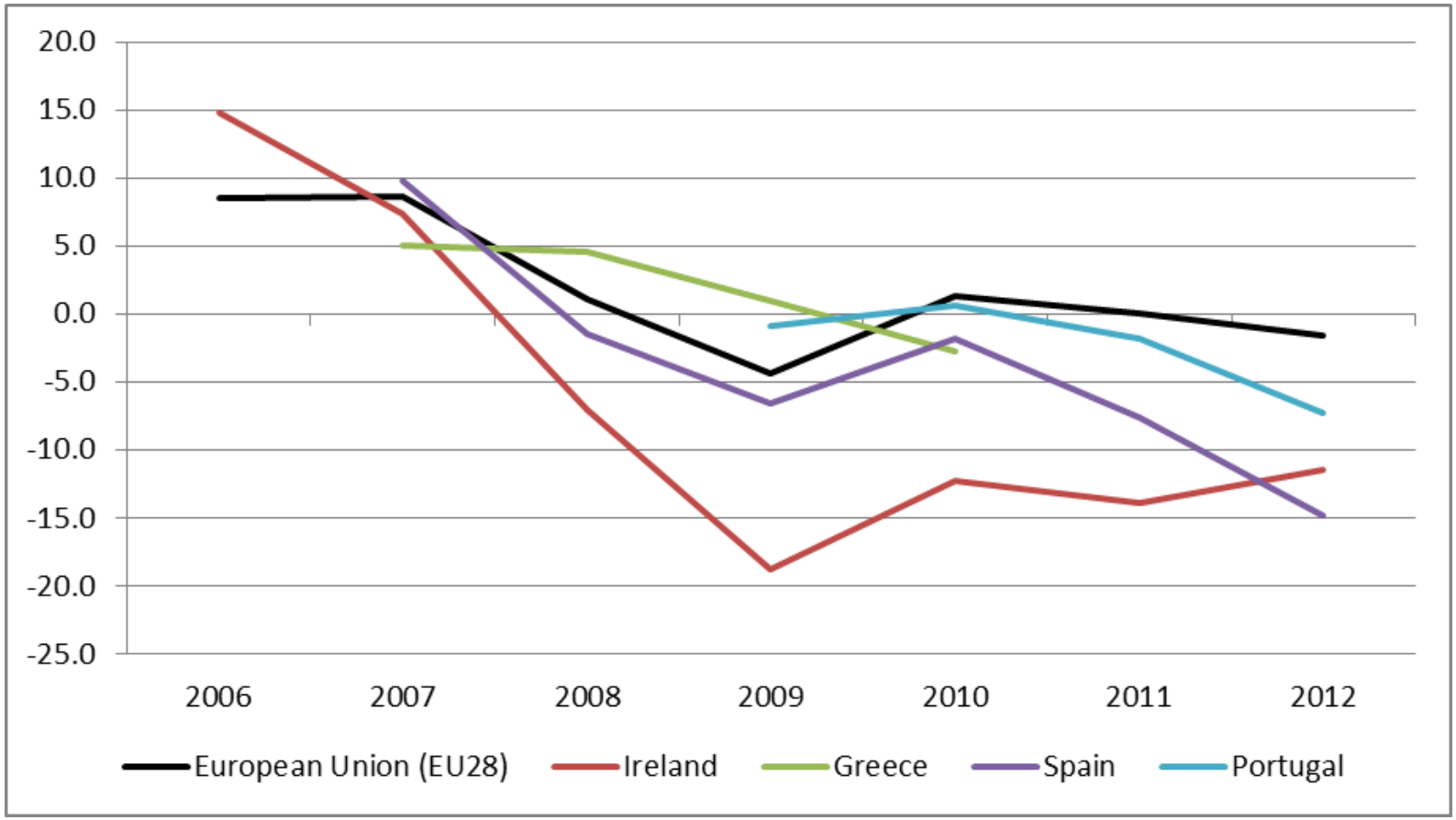

ARCHITECTS/ENGINEERS/DESIGNERS

Section developed by Prof. Hal Johnston

TREND 1

- Toward a two-tier market?
    - Industry consolidation is ambiguous
    - Large design firms keep getting larger
    - Smaller design firms specialize in niche practices and markets
    - Fewer choices for contractors

TREND 2

- Growth through increasing acquisition activity?
    - More money available for investment and speculation
    - Only exit strategy for many owners
    - Becoming a bigger entity is more attractive
    - Rate of acquisition may decrease as business owners wait on the sidelines

ARCHITECTS/ENGINEERS/DESIGNERS

Section developed by Prof. Hal Johnston

TREND 3

- Convergence of design and construction?
    - Construction will be performed via design-build
    - Full in-house services
    - Opportunity for de-commodification of services
    - Increased opportunities for teaming relationships

TREND 4

- Design professional role changes?
    - Design professionals valued for their business skills, not just creativity
    - Competitive position - firms follow clients, not projects
    - Firms will get more opportunities to be in positions of authority on projects because of relationships with owners

ARCHITECTS/ENGINEERS/DESIGNERS

Section developed by Prof. Hal Johnston

TREND 5

- Architecture lags behind engineering in responding to changed marketplace?
    - Architecture is generally more risk-averse
    - Architecture is slower to acclimate to changing environment
    - Less and less involvement by pure architectural firms in the construction process

TREND 6

- Extraordinary battle for ordinary people?
    - Significant demand for skilled labor nationwide
    - Attraction of top candidates to other industries
    - Significant decrease in competent personnel at key positions…especially project management

ARCHITECTS/ENGINEERS/DESIGNERS

Section developed by Prof. Hal Johnston

TREND 7

- Design-Build?* - Advantages
  - Potentially less adversarial and more flexible
  - Risks for design errors and omissions are shifted from the owner to the design-builder, who presumably can resolve them more efficiently
  - The constructor is involved in the design process and can contribute valuable insights as to constructability and value engineering
  - The owner or the design-builder can order long lead-time items earlier in the process with greater certainty
  - Faster project delivery
  - In a market with rising material costs, the owner or design-builder can achieve earlier procurement at lower prices
  - The potential for claims, particularly delay claims, is significantly reduced.

**a method to deliver a project in which the design and construction services are contracted by a single entity*

ARCHITECTS/ENGINEERS/DESIGNERS

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TREND 7

- Design-Build? - Drawbacks

  - Potentially less adversarial and more flexible
  - Less control by owner over design process
  - Results may depend on design-build experience of constructor and architect and their experience working together previously
  - May limit field of contractors and subcontractors willing to compete
  - Because of the more subjective method of constructor selection, the price at the front-end of a design-build project may be higher
  - Bond premiums and the design-builder's fee/profit are higher than under design-bid-build

CONSTRUCTION INDUSTRY SUSTENABILITY

Buildings account for:

- 30 % of all greenhouse gas emissions
- 70 % of electricity consumption
- 39 % of U.S. primary energy use, including fuel input for production
- > 12 % of all potable water use
- 40 % of raw materials consumed globally

The “greening ” of construction industry:

- The Kyoto Protocol to the United Nations Framework Convention on Climate Change

- Canada green building council

- Construction and demolition waste management practices and their economic impacts - http://ec.europa.eu/environment/waste/studies/cdw/cdw_report.htm

CONSTRUCTION INDUSTRY SUSTENABILITY

Can create new ways to gain advantage by:

- Lowering costs
- Differentiating products and services
- Leveraging experience and core competencies
- Identifying new market and geographic strategies

Posible strategies (C21 Steering Committee – Singapore)

- Enhancing the Professionalism of the Industry
- Raising the Skills Level
- Improving Industry Practices and Techniques
- Adopting an Integrated Approach to Construction
- Developing an External Wing
- A Collective Championing Effort for the Construction Industry.

CONSTRUCTION INDUSTRY SUSTENABILITY

Environmental Impact and Considerations of Construction Activity

(Ofori, G. (1999) Satisfying the customer by changing production patterns to realise sustainable construction. Proceedings, Joint Triennial Symposium of CIB Commissions W65 and 55, Cape Town, 5-10 September, Vol. 1, pp. 41-56.)

What is used	Where it is built	How it is built	What is built
* where raw materials are obtained	* location of facility; nature of terrain and ground conditions; alternative uses of the land	* methods of construction on site	* planning and design of facility (eg. potential of daylighting and natural ventilation)
* how raw materials are extracted; how land is restored after extraction (if necessary)	* immediate physical environment; proximity to water sources and ecosystems	* construction project management systems (eg. quality management systems)	* life-cycle economic, quality, maintainability considerations
* how raw materials are processed	* social disruption (eg. displacement of site's inhabitants)	* site control measures (housekeeping)	* extent of use of energy and other resources in operation of building
* whether, and how renewable raw materials are regenerated	* economic disruption (eg. loss of livelihoods of previous inhabitants)	* welfare of site workers, neighbours and general public	* ease of demolition of building (deconstruction)
* how materials are transported to, and stored on, site	* present infrastructure, need for expansion to serve new building, its impact	* resource management (including waste minimisation)	* recycling and reuse of demolition waste
* how materials are moved on site	* impact on local vehicular traffic		

Environmental Characteristics of sustainable technologies

(International Institute for Sustainable Development)

Aspect	Remarks
Low environmental impact	• very low or benign emissions to the environment in production, use or disposal • no toxic releases, benefits environment indirectly through its efficiency
Resource efficiency	• efficient utilisation of material resources, often using recycled material • based on renewable resources and energy (or minimal use of non-renewable resources) • efficient consumption of energy in production and use • durable, reusable and/or recyclable
Economic advantages	• economically cost-effective compared to conventional product or service • incorporate externalities in market price • can be financed by the user through various financial saving streams • improve productivity or competitiveness of industry and commerce
Social advantages	• enhance or maintain living standards or quality of life • readily available and accessible by all classes and cultures • consistent with themes of decentralisation, individual control, democracy

CONSTRUCTION INDUSTRY SUSTENABILITY

Waste Management

- Design Phase
  - Opportunity to build realistic specifications for reducing waste
  - Waste is generated systematically

- Construction Phase
  - Green materials: susceptible to jobsite theft
  - Each projects has waste stream characteristics
  - Contractor should have documented procedures for waste reduction

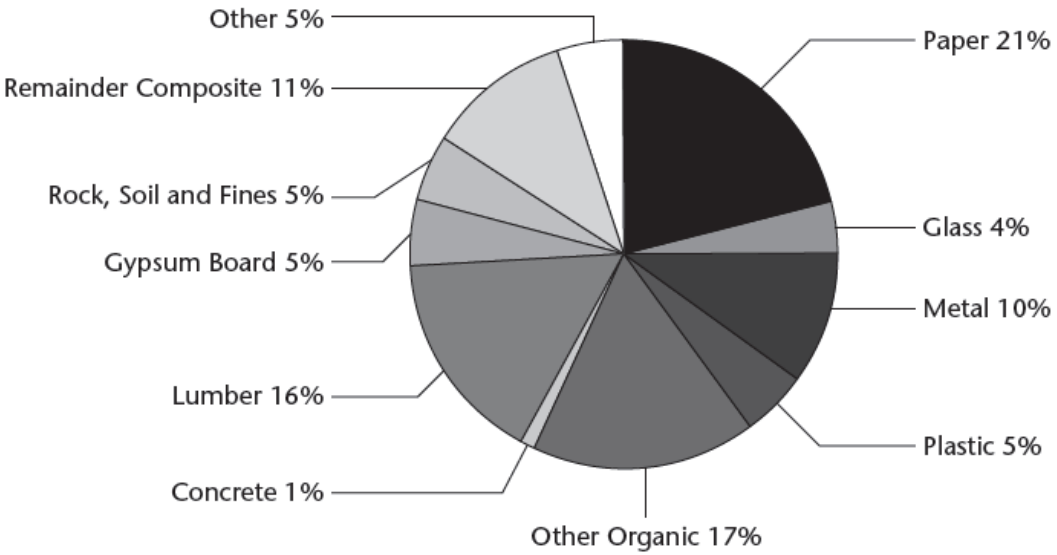
- Purchasing Phase
  - How is the material packaged?
  - Is the packaging material green?
  - Can packaging material be used in other ways?
  - How is the material shipped?
  - Is there a plan or program for returning pallets, containers, and/ or material?

CONSTRUCTION INDUSTRY SUSTENABILITY

Waste Management

- Recycling and Reuse of Waste On-Site
  - Documentation of how waste is generated
  - A plan for dealing with disposal and reuse
  - Understanding local and state material recycling and salvage requirements

- Other info: http://www.steelconstruction.info/Residential_and_mixed-use_buildings



GLOBALIZATION AND CONSTRUCTION INDUSTRY

Advantages and Disadvantages of Globalization for the Construction Industry

(http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.198.2916&rep=rep1&type=pdf)

Advantages	Disadvantages
Involvement of international finance makes possible the implementation of several projects, such as those of major infrastructure.	Local construction firms have no funds or expertise to participate in the sponsorship of privatised projects.
Direct foreign investment in projects leads to increase in construction demand, creating work opportunities for local firms.	Local construction companies lack the technical and managerial capability to undertake most of the foreign-funded projects.
Competition among foreign firms lowers the costs of projects to developing countries.	It is possible that local firms will be deprived of the opportunity to grow (Hillebrandt, 1999).
Presence of large numbers of international firms offers scope for technology transfer and the development of local firms and upgrading of the industry. The large number of such firms also means that technology transfer can be a tool for competition.	Foreign construction firms may pay lip service to technology transfer (Carillo, 1994) or take measures to avoid it. Moreover, local companies may not be in a position to benefit from technology transfer, or to subsequently utilise the acquired expertise.

CONTACT

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http://www.ct.upt.ro/suscos/index.htm
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