ESD.84 Doctoral Seminar – Session 11 Notes
Guests Presenting: Thomas Kochan and James Foster

Session Overview:

- Welcome and Overview and Introductions (5-7 min.)
- Initial Identification of Questions from Readings (7-10 min.)
- The Dynamics of Gridlock in Regulatory Systems: Guest Presentation by Thomas Kochan (20-30 min.)
- Discussion (10-15 min.)
- Private/Public Interactions Driving Mutual Gains in Regulatory Systems: Guest Presentation by James Foster (20-30 min.)
- Discussion (10-15 min.)
- Break (10 min.)
- Influence of Government R&D on Economic Development / A Historical Analysis of Government Spending in Science and Technology: Student Presentation by Heidi Davidz (10-15 min.)
- Next Steps (10-15 min.)

Initial Questions for Thomas Kochan:

- What can industry and labor do outside the regulatory system?
- On the issue of in-house dispute resolution – what would be the agency or funding to support this and how would you separate out the influence of management in this case if they are providing the funding?
- What is the impact of the recent elections on these issues with labor and competitiveness?
- How to get unions to understand that lean is about worker participation, not just about eliminating jobs – example of challenge in the aerospace industry?
- How far can the issue of worker participation go?
- What about the issues of trust in union-management relations – in order to work together to grow jobs?
- Say more about the issues of prospective layoffs at Fiat and consequent sale to GM

Initial Questions for James Foster:

- Are there instances where corporations have taken the lead in order to promote better public outcomes through mechanisms such as merger and acquisition – including impact on labor outcomes?
- Reviewing proposed project with broad goals around globalization across six sectors – say more about the logistics of a project of this type
- How does the hydrogen economy relate to diesel issues in the readings?
- Say more about the contrast between U.S. and Europe on environmental issues – what would explain this?
- What are the tools available in the design of regulations to ensure or protect against unintended consequences?
- Focus on collaboration around new engines and other matters outside of anti-trust constraints – a capital intensive domain
- How do regulatory dynamics differ across industries – pharmaceuticals

The Dynamics of Gridlock in Regulatory Systems: Guest Presentation by Thomas Kochan

- The health and safety article is a case of a failed engineering system
    - On the verge of an even larger cataclysmic disaster with the spread of the vapor cloud – about a half an hour away from such a disaster
    - Here are some of the world's best safety engineers, but they were constrained in working with the contactors
    - There are were also intangibles around the regular work force and supervisor in the interactions with the contract workers
    - Supervising, controlling and training the contract workers would covert them into regular employee status
    - Underlying issues around labor and management relations
    - One simple rule in this case could have a large impact: The host employer is responsible for safety for all employees on a worksite
    - This is happening on an informal basis
    - Links to apprenticeships and training in this industry
- Case example of Bechtel that operates in many very different regulatory contexts
    - Need to have core values as a company in order to succeed in such contexts
    - Proposed to U.S. DoL to voluntarily develop own standards – with clear records at or above industry performance – with then reduced levels of inspections – now a part of public policy
- Lessons form Dupont and Alcoa on safety
    - Dupont is an engineering culture – with a great deal of emphasis on safety
    - High levels of power by the safety engineers in the organization – more of a top-down management strategy
    - Alcoa's systems driven by Paul O'Neal – who drove these issues on a value basis as CEO – a powerful driver but dependent on strong leadership
- Issues of more decentralized regulatory systems are still very much on the agenda – and alternative dispute resolution systems
- Role of the Food and Drug Administration in the production of Pharmaceuticals – product safety now (not just worker safety) – such as case of Abbott labs
    - Issue that once you are in the FDA "gun sights" it is hard to get out
- How to think about safety as a systems architect?
    - Begins with initial facility and organizational design
    - Involves building social and technical systems for ongoing operations
    - Requires high levels of voice / participation by the workforce on an ongoing basis – in the spirit of continuous improvement
    - Ultimately it is a safety culture that has to be built
- Link to capability maturity matrix for safety
    - Level 1 – able to clean up after accidents
    - Level 2 – able to prevent accidents
    - Level 3 – able to learn from near misses
    - Level 4 – able to address system-level root causes
    - Level 5 – able to sustain safety culture across generations of leaders and members in the organization
- Consider issues of grid-lock and related matters such as lean issues with the workforce
    - The word "lean" is a difficult word given the baggage that it carries
    - Examples of workers deeply involved in continuous improvement generally involve some link to understandings on job security

- Focus on the role of government and the role of people here at this seminar
    - You may be called in as an expert to work with government or independent commissions – to know how to bring your expertise to bear on these issues – a quasi-public and quasi-private role – with complicated boundary spanning issues
    - You may be working in a government agency as staff on regulatory initiatives and commissions – which can be either a powerful enabling role or a complicated constraining role
        - Use your tools for stakeholder mapping, negotiations, facilitation and other skills in these roles
    - You may be a leader serving on a regulatory commission or task force
        - Requires courage to stand up for your values and your technical expertise
- Lesson from the Dunlop commission – parties were too polarized for this to be effective, at least without strong Presidential leadership on these issues
    - Key issue of the framing of the mandate or charter for the Commission
- Issues of safety standards in the U.S. driving unsafe practices off-shore
    - This has certainly been a historical issue, but the global nature of the economy and increasing transparency is changing the rules of the game – especially around consumer products – consider the Global Compact advanced by the UN
- Issues of life-long learning by the workforce to operate with the needed flexibility
    - Example of joint training funds
    - Still issues of market failure around individual firm dis-incentives to invest in training

Private/Public Interactions Driving Mutual Gains in Regulatory Systems: Guest Presentation by James Foster

- Project has been underway for two years – with a book coming out by MIT press
    - Globalization, free trade and regulatory diversity
    - Issues around removal of regulatory barriers to trade – which links to issues of health and safety, for example
    - Issues of harmonization across regulations
- Diesel issues – in U.S. – highly irrational
    - Not much of distribution now for one kind of diesel and regulations are driving four kinds of diesel
    - Issues of fuels using common pipelines with residual sulfur levels, for example, and issues of regional variation in standards – with availability not in rocky mountain states and resulting worse system outcomes (15 part per million versus over a 1,000 parts per million for different grades of fuel)
    - This is driven by small refiners – not even a problem of unintended consequences
    - Off-road diesel is farmers and construction equipment – but farmers are too well protected – hence the four grades of diesel
- Contrast with European case – where majority of all new cars are diesel – at max production capacity given the high cost of petrol and subsidies for diesel fuel
    - A competitive advantage in Europe – over the U.S. and even more over Japan – an enormous windfall for European manufacturers
    - Undercuts movement toward harmonization

- Petroleum Infrastructure is an enormous opportunity for systems simulation – desperately needed
    - Special issues around California MTBE elimination which then requires the use of trucks for ethanol from Midwest – can't be handled by all the trucks in the universe since there is no pipeline – a systems failure in the making
- Public policies rarely adapt to new information
    - Paper on the "dead hand" of innovation
- Corporations who follow effective environmental practices have much better experience recruiting and retaining the workforce – as well as in regulatory compliance
    - Lord Brown at BP says that their green policy has had a fantastic impact on recruitment and retention
- Corporate role in the regulatory process
    - Business as victim – regulation as a cost
    - Regulatory capture – regulation to protect public interest
    - Regulatory competition – regulation as a source of competitive advantage
- Issues of regulatory incentives
- Issues of value proposition – need to understand the nature of the business to then understand the regulatory inter-relationship
    - R&D
    - Production
    - Product and Service Distribution
    - Marketing
    - Distribution
- Where in the value chain can regulation be used to make money
- Example of recycling paper company
    - Dealing with the volatility in paper and energy supply – by collecting garbage and paper as part of new community environmental regulations – controlled supply of inputs – grew to $2 billion in business (largest recycle paper company in the U.S. and then franchised the idea)
- "Offensive" (not defensive) exploitation of regulations
    - BP's reputation has earned much greater flexibility on anti-trust grounds relative to Exxon/Mobil
    - ARCO – giving value to assets – as sole producer of MTBE oxygenates in gasoline a competitive advantage
    - Unocal – actual "theft" under new oil industry standards – in case of a non-compete agreement where Unocal none-the-less sought patents on ideas emerging from the effort
        - 5.5 cents per gallon for every gallon sold – when refiners are lucky to even make one cent per gallon
- Regulation and market segmentation
    - Contract integration systems
- Regulation is not context – it is integral to all elements of the diamond drawing
    - It is a powerful tool to reduce uncertainty (market standards) – could not boogie without this dance music
    - It is a way to make the world more complex and hence reduce threats of market entry or to make things less complex to simplify choices
    - Technology choices best made with additional lock-in enabled by regulation – let government pick standards
- Say more about differences among industries
- Regulatory process may make good business sense, but is it good for society?

- The food industry is a good model – illustrating the full range of alternatives – look at Nestle – largest growing item is bottled water – selling for same prices as other beverages – and Nestle owns everything (virtual world wide monopoly in bottled water) with very high standards supported by Nestle – but Coke discovered that waste water coming out of pipes in plants met standards and then the environmental regs became part of the solution

Integrating comments

- Regulatory systems may be dominant relative to technical systems – something that is hard to accept as an engineer
- There are still market mechanisms here – key issues around the interdependence of markets and regulation
- Consider industries that are not dependent on technology – such as financial services – the industry is all about regulatory distinctions and rules
- Skillful regulation can promote innovation – example of CAFÉ giving competitive advantage to Japanese manufacturers and aiding innovation among them

Influence of Government R&D on Economic Development / A Historical Analysis of Government Spending in Science and Technology: Student Presentation by Heidi Davidz

- Overview
    - Change in policy after WWII
    - Trends in Federal R&D expenditures
    - Who performs what research?
    - Globalization of U.S. R&D
    - Next steps
- WWII changed Federal government R&D support
- Universities benefited from the changes after WWII
- Industry outspends the Federal government in R&D – graph "crossed" in mid to late 1970s
- Total U.S. R&D funding is growing significantly
- Defense R&D still leads Federal R&D, but narrowly
- NIH is the lead agency in Federal R&D funding
- In R&D, often the emphasis is on "D" development
- Industry performs 75% of U.S. R&D
- Universities are performing more Federal R&D
- Universities lead in performing basic research
- The U.S. innovation system is not a closed system – global flows
- The power of U.S. R&D spending is decreasing
- Key Points
    - The world has changed dramatically in the past 50 years
    - Lead sources of technology development have changed
    - Commercial industry leads defense industry in many critical technologies
    - U.S. industry no longer has sole leadership of many critical technologies
- The Changing Relationship between Science and Government
    - "University-government relationships have changed with every major war," states Lewis Branscomb
    - During World War II (Known enemy, war with an end point)
    - The science and technology community was totally dedicated to defeating the enemy
    - After World War II, the Federal government became the principal source of funding for universities
    - During The Cold War (Known enemy, indefinite duration)

    - The “war” was run by the military-industrial complex and society supported it
    - The U.S. depended on S&T to compensate for the asymmetry of being outnumbered by Soviet forces
    - War on Terrorism is different (Unknown enemy, indefinite duration)
    - How much change is needed in the relationships of the U.S. university-government-industrial system?
- Discussion:
    - Share of R & D going to regulatory compliance is substantial – research would be 80%, less in area of product development
    - Issue of R & D being outsourced
    - Issue of R & D spending with commodity products
    - Issue of R & D as a source of capitalistic growth
    - SBIR process – a “tax” on R & D to support small business innovation
    - Issue of increased R & D investment in Asia and other nations
    - Issue of regulatory acronyms and complexity as a barrier to entry
    - Movement to smart packaging in paper industry – shifting into a logistics industry with bar codes and gps integration into packaging
    - Link to sustainability
    - Recent NBER paper on these issues
    - How does the distribution of federal R & D investment impact advancement in other domains – such as focus on NIH and impact on life sciences relative to other domains
    - As value chains and inter-relations get larger and more complicated – the challenge of linking to regulatory systems increases – including links to NGOs
    - Contrast with mobilization of public support in a crisis versus in the absence of a publicly perceived crisis