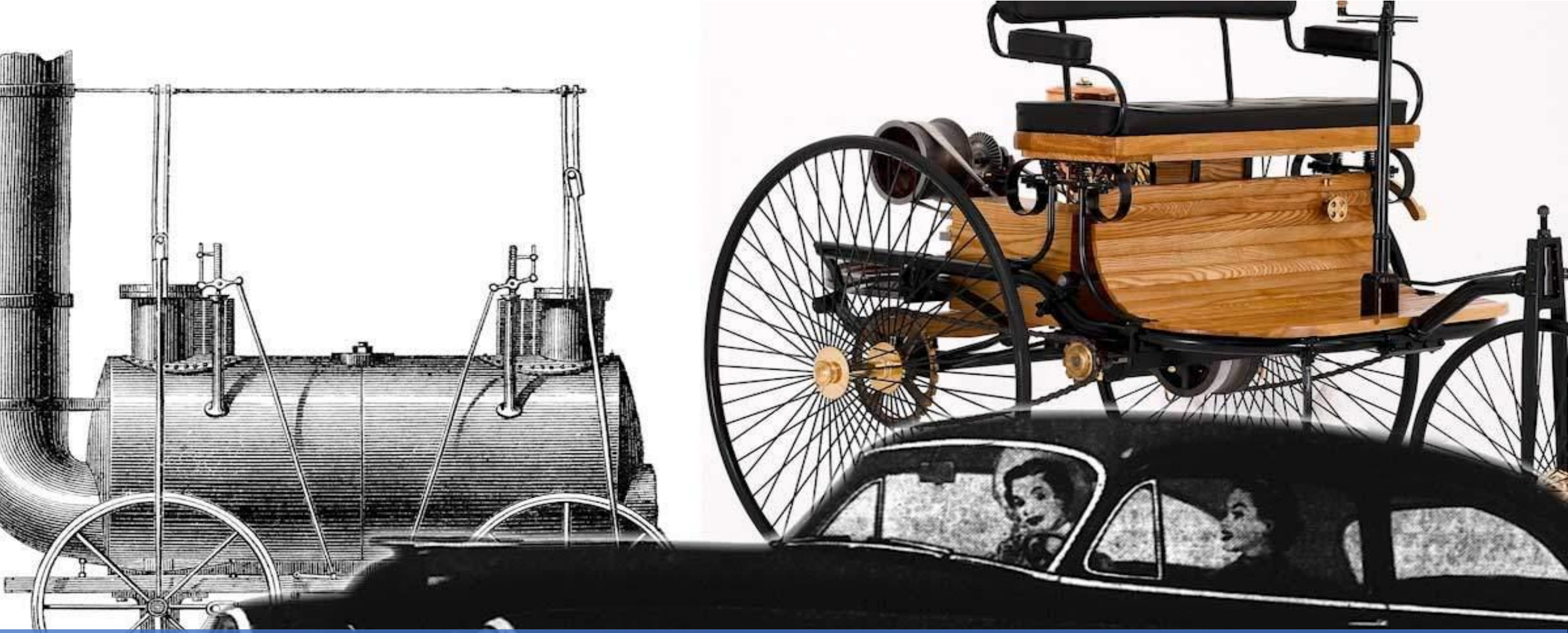
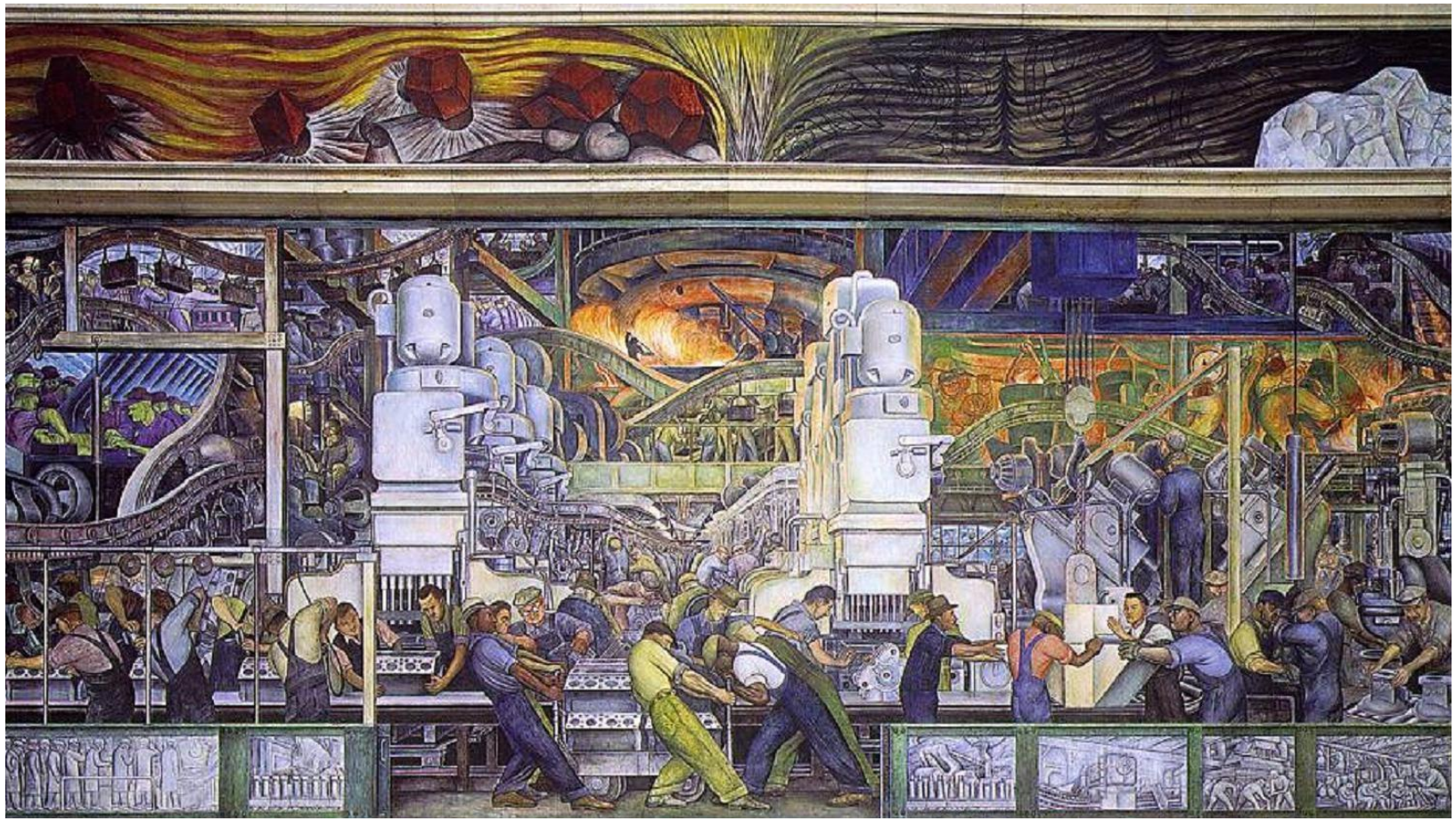


Lessons from the Automotive Industry History: Organization and Supplier Relationship

Changkeun Lee KDI School of Public Policy and Management

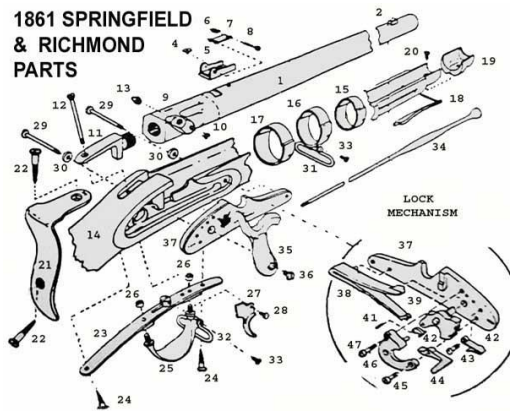
A Little Bit about Me

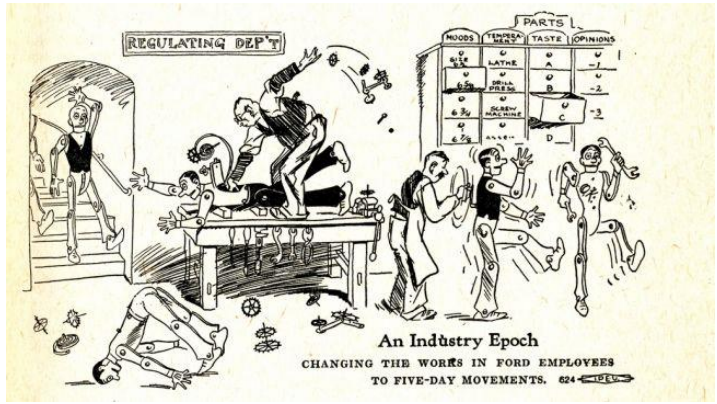


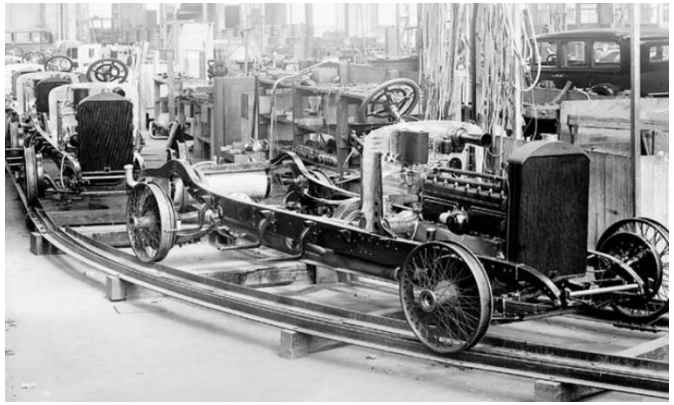
Diego Rivera's Mural, Detroit Institute of Arts

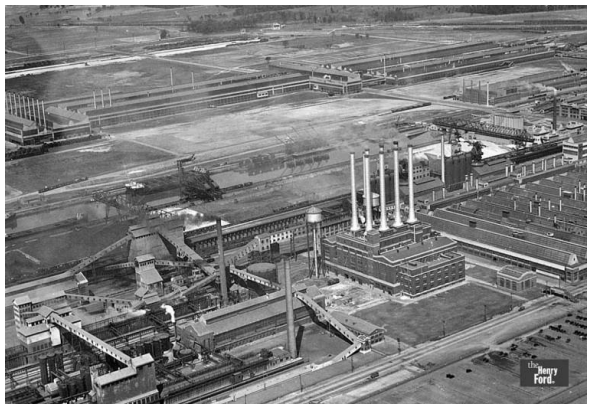
I did PhD in Economics at U of Michigan, majoring in economic history.
My dissertation was about the interplay between firm's decisions and industrial outcomes.
The 1st chapter explored how auto firms' responded to the Great Depression.
Productivity determined survival and growth of single-plant, craft producers. But it was not the case for multi-plant producers.

Historical Development of Auto Industry



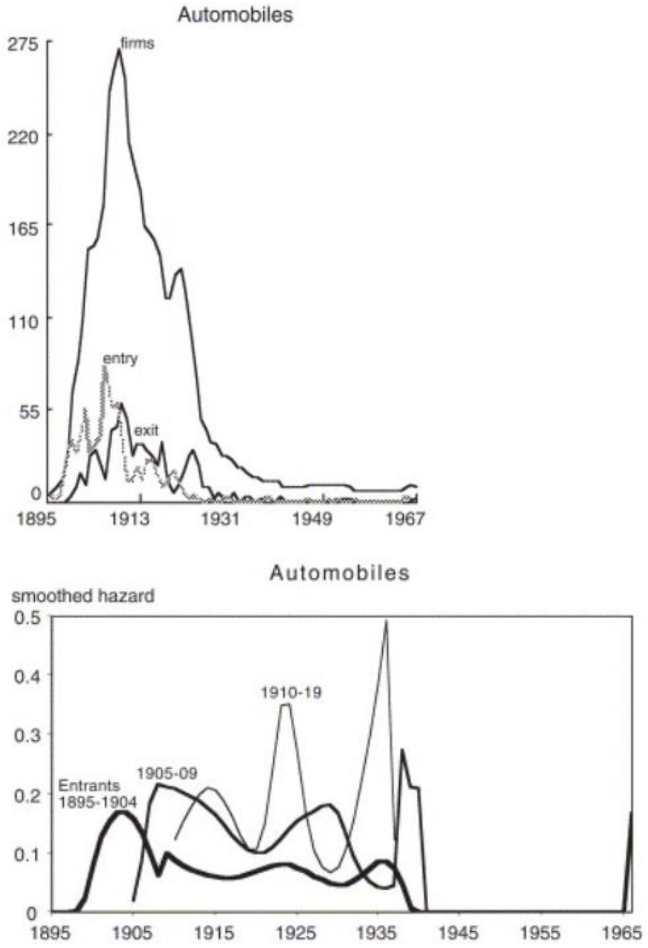






- Auto industry symbolizes the second industrial revolution.
- It was a process of making a system dealing with complexity.
- American system of manufacturing standardized manufacturing.
- Taylorism identified best practices and incentivized workers.
- Assembly line revolutionized by synthesizing all technical elements and connectin g production and consumption.
- We remember the system as Fordism.
- But historians say that it is a oversimplified interpretation.

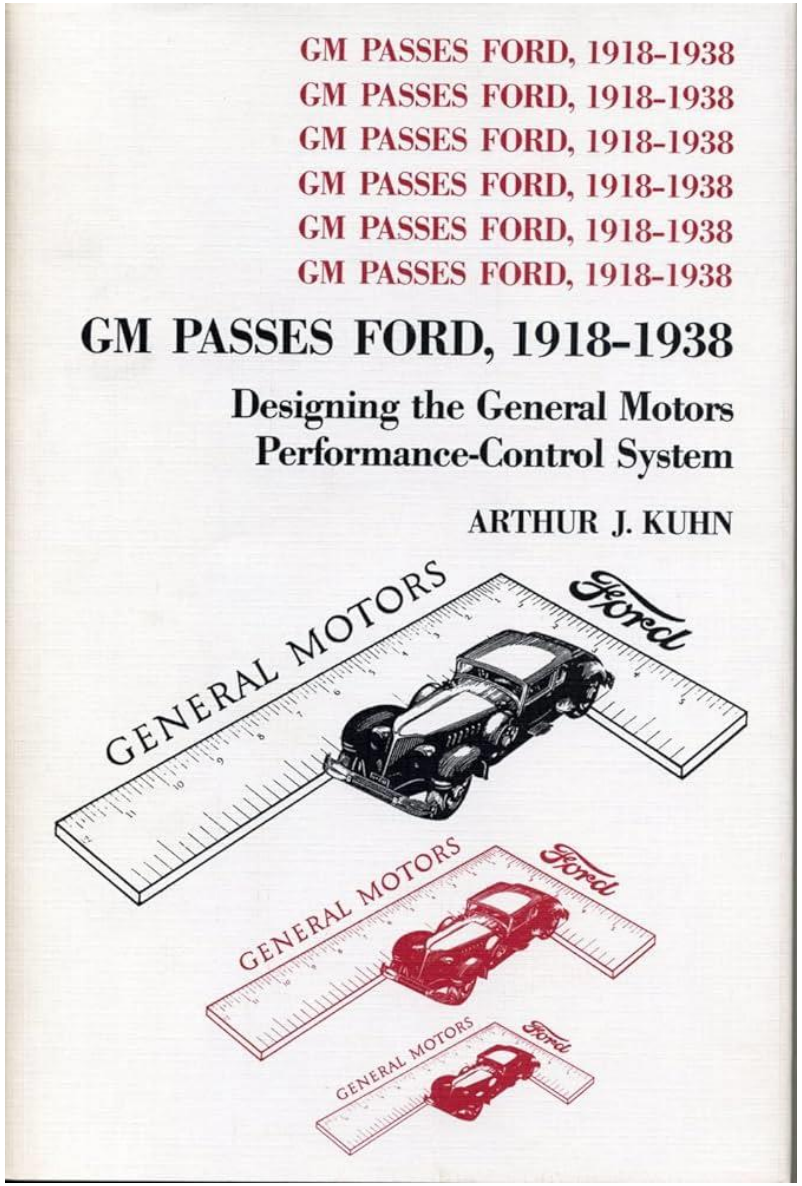
Industrial Change and Firms

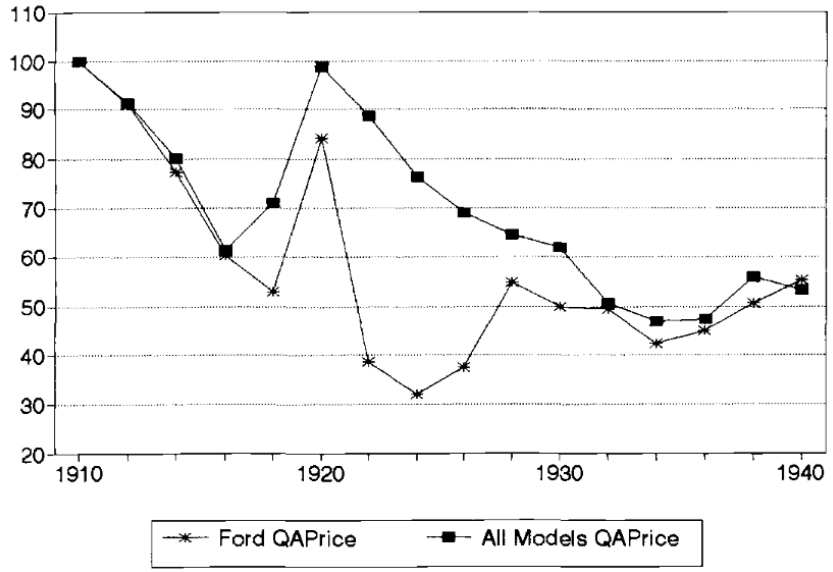


Klepper and Simons (2005) "Industry shakeouts and technological change," *International Journal of Industrial Organization*, Vol. 23, No. 1-2: 23-43.

- Industry shakeout change the structure.
- In many industries, oligopoly was the outcome.
  - In auto, GM, Ford, and Chrysler were the winners.
- What triggers shakeout?
  - Radical invention theory: major technical change from outside.
  - Competitive advantage theory: entry barrier R&D built by early entrants' R&D.
- Historical patterns indicate that shakeouts are an outcome, rather than a cause, of early entrants' innovation effort to stay as leaders.
- So what matters is the ability to cope with the ever-changing environment.

Tale of General Motors: Victory of the System?





Raff (1996) "Quality-Adjusted Prices for the American Automobile Industry: 1906 -1940," in Bresnahan and Gordon, *The Economics of New Goods*.

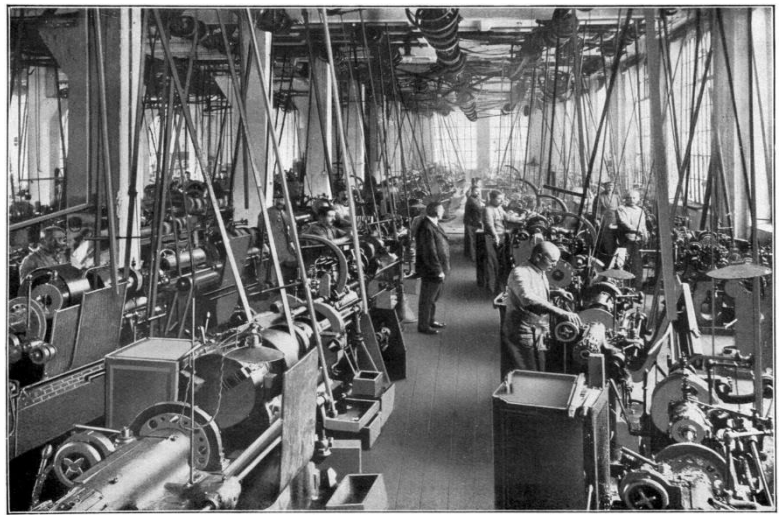
- **Ford enjoyed cost advantage until the Great Depression, but GM inc reased their efficiency rapidly.**
- **The Great Depression wiped out most craft makers and made price the most important.**
- **Many people, such as Kuhn, have believed that GM's emphasis on system and performance-control system made them the industry leader. Ford is viewed as an example of "anti-planning."**

Tale of General Motors: Victory of the System?

- In this view, GM's decline after 1980 is the result of high legacy costs and the departure from the system-oriented management.
- Some scholars highlight the importance of technological short term-ism
- However, Helper and Henderson (2014) argue that GM's decline is due to the failure in relational contracts and management practices, which were necessary for modern product design.
  - "particularly, GM's historical practice of treating both its suppliers and its blue collar workers as homogeneous, interchangeable entities"
  - "its view that expertise could be partitioned with minimal overlap of knowledge amongst functions or levels in the organizational hierarchy"
  - "In the 1960s and 1970s, jobs on the General Motors assembly line were very narrowly defined"
  - "Jobs on Toyota's production line were even more precisely specified: However, Toyota's employees had a much broader range of responsibilities"

Helper and Henderson (2014) "Management Practices, Relational Contracts, and the De cline of General Motors," *Journal of Economic Perspectives*, Vol. 28, No. 1: 49-72.

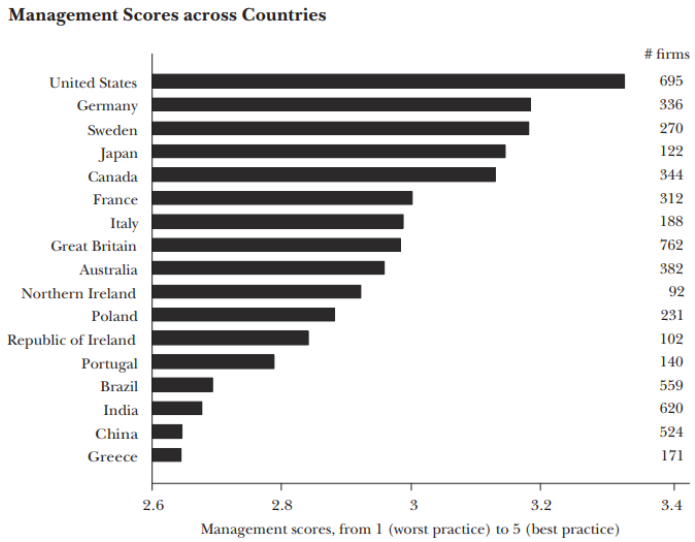
Management Practices Matter

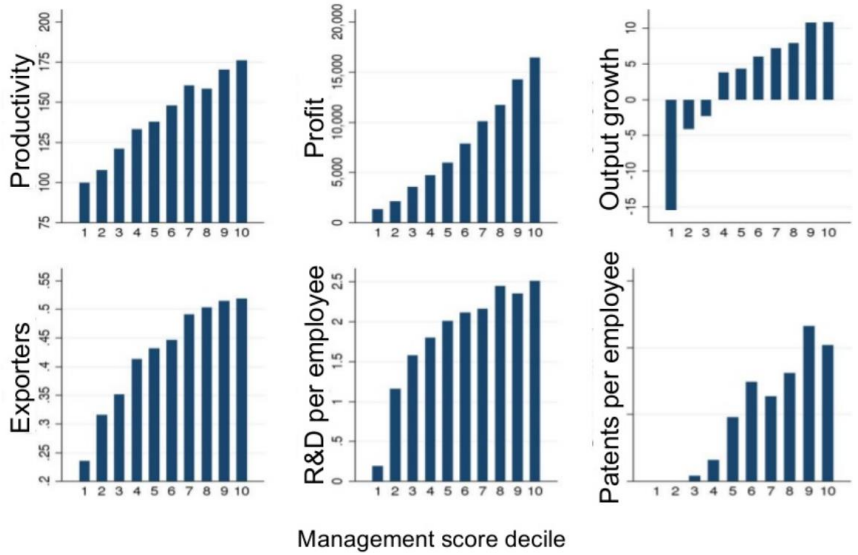


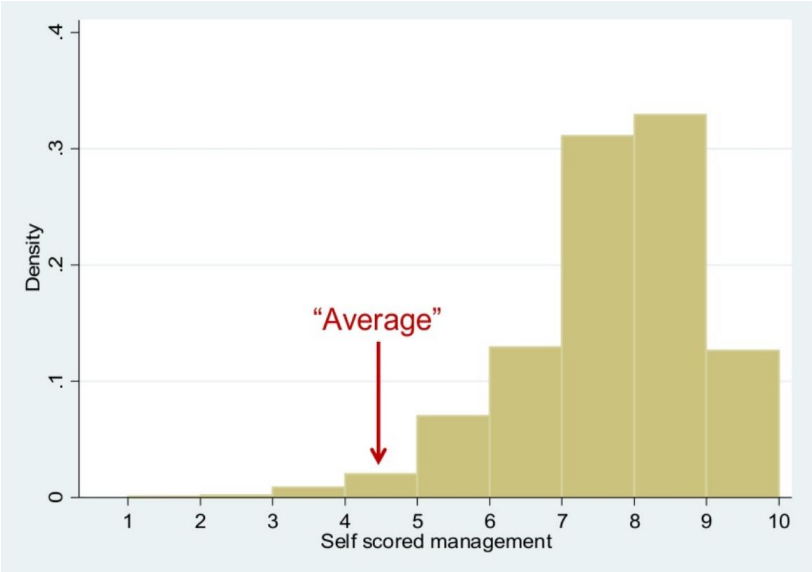
- **Similarly, historians view that the Ford's success was an outcome of organizational effort.**
- **Productivity potential of electricity was realized when group drive was introduced.**
- **Nye (2014) says that the decline of US auto industry was a collective failure.**
  - **"The assembly line was not a final result, but a part of an ongoing cultural process"**
  - **"Ford and his engineers tried to solve the problem of the hour under the existing conditions and engage in constant communication"**
  - **"They had a great vision, but they were not tied to any particular way to achieve the goal"**
  - **Fordism is simplification of history – "the past has often been oversimplified and mis-remembered"**
  - **Past success brought failure in facing and addressing change**

Nye (2014) *America's Assembly Line*, MIT Press..

Why Management Practices Matter

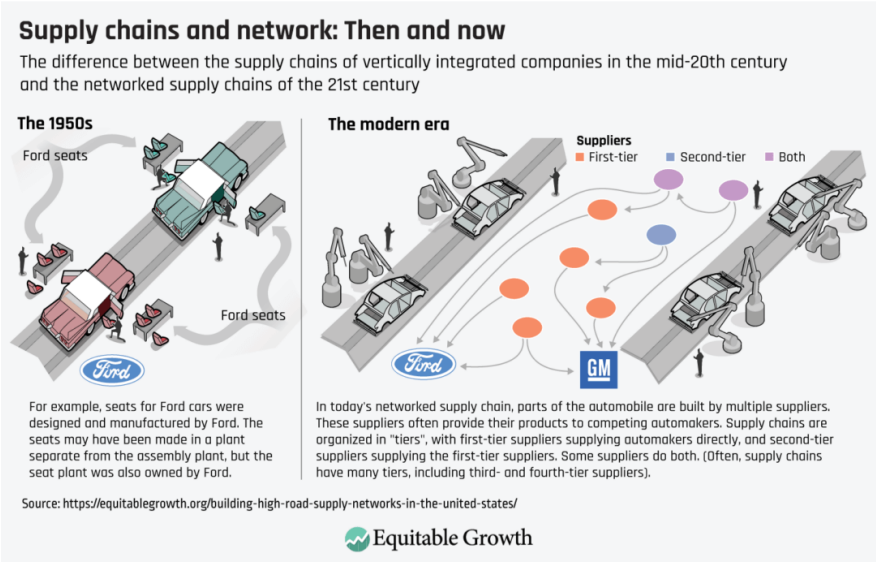






- **Bloom and van Reenen evaluate management practices of firms and show sizable differences between and within countries.**
- **Quality management is associated with better economic performance.**
- **Then why does good management practices not diffuse?**
- **An explanation is the lack of objective evaluation, or overconfidence.**
- **History shows that past successes strengthen such a bias.**

Supply Chain Management



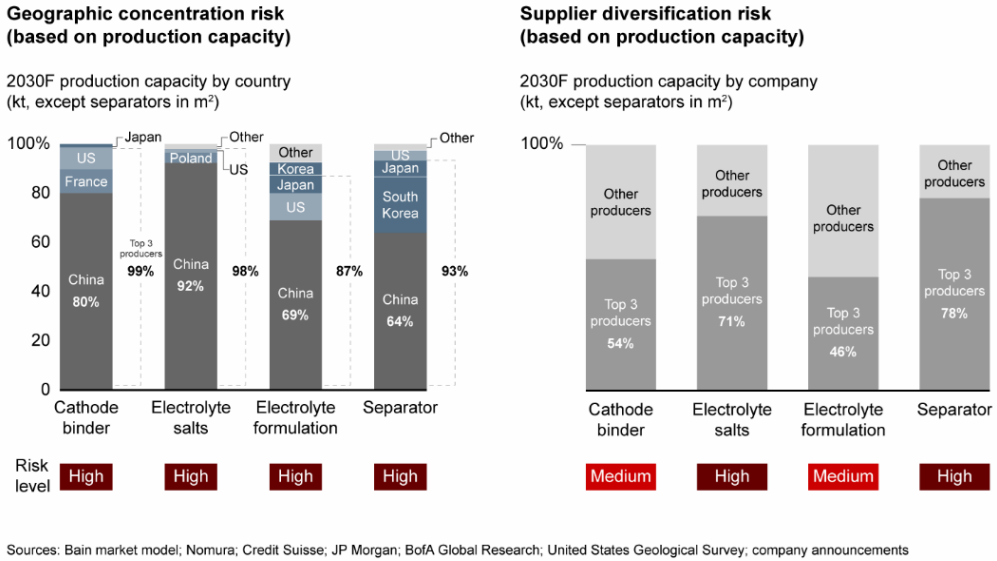
	1992	1995	1997	2000	2004
# of suppliers with:					
>$10bn global sales	3	3	4	8	11
$5–10bn global sales	2	11	10	10	12
$2–5bn global sales	11	36	33	35	41

Exit	Voice	Hybrid – New Collaborative
Arm's length and transactional	Long term and relational	Long term and relational
Open for new suppliers to bid	Set of potential suppliers mostly closed	Open to new suppliers, after a vetting period
Competitive selection by low bid–frequent and speedy exit	Selection based on capabilities–exit rare and slow	Competitive assessment–intermediate frequency and speed of exit
Design simplified by customer to enlarge pool of suppliers	Design controlled by customer, supplier involved via resident engineer	Larger design role for supplier, attention to supplier design capabilities
No equity stake	Often an equity stake	Equity stake depends on criticality of technology
Contracts for governance	Norms/dialogue for governance	Norms + process management routines for governance
Codified procedures	Tacit procedures	Process management routines make procedures explicit

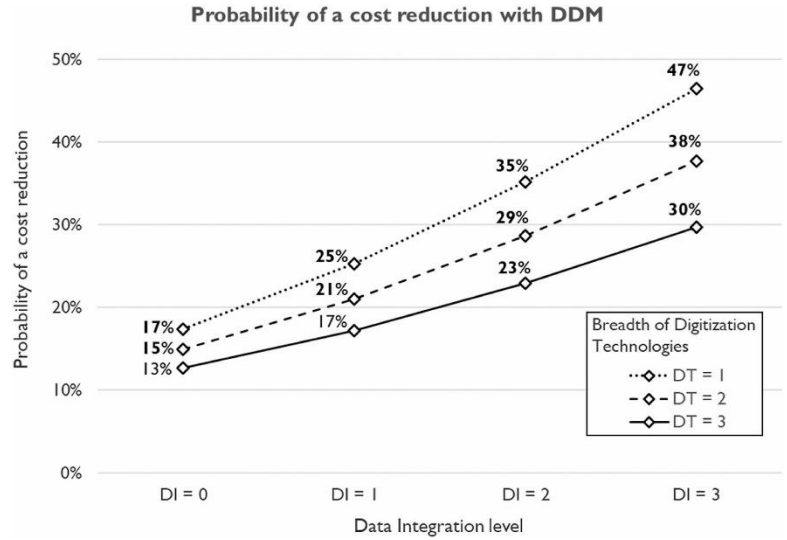
- **Historians also emphasize the importance of long-term relationships with suppliers.**
- **The 1970s saw the rise of mega suppliers, and Germany and Japan developed more network-based (rather than vertical integration) system, which was crucial in their catch-up.**
- **While US managers believed in modularization, coordination was more important in addressing consumer demands and technology.**
- **Then why didn't GM adopt the Toyota way?**
  - **GM has been a leader. Arm's-length relations may have been the best strategy.**
  - **Past success made the industrial leader risk-averse and stick to the proven way.**
  - **So their supply relationship was "close and adversarial."**
- **Insider-outsider problem can exacerbate the problem. Detroit's failure was a collective one.**
- **In *pragmatic collaboration*, dialogue between players is essential.**

MacDuffie and Helper (2014) "Collaboration in Supply Chains With and Without Trust," in Heckscher and Adler (eds.) *The Firm as a Collaborative Community*, Oxford University Press.

Challenges Ahead



Sources: Bain market model; Nomura; Credit Suisse; JP Morgan; BofA Global Research; United States Geological Survey; company announcements



Colombari et al. (2023) "The interplay between data-driven decision-making and digitalization: A firm-level survey of the Italian and U.S. automotive industries" *International Journal of Production Economics*, Vol. 255.

- **The rise of electric cars increased the importance of battery, semiconductor, and rare earth.**
  - **The need for global supply chain resilience make politics and policy more important.**
  - **For this reason, we see more strategic partnerships and environmental regulation.**
  - **Industry, community, and government outreach becomes more important.**
  - **Transition to EV makes many parts obsolete, but create new demand, though the pace is uncertain.**
- **Narrowing the gap between collective need and individual suppliers' capacity is the key.**
- **Digitalization is about changing processes and organizational structures.**
  - **Data-driven decision making improves performance, but it requires organizational learning.**
- **Public policy's role should not only focus on supplying financial resources. Government should pay attention to changing global environment and maintaining an open local ecosystem.**