Employment, innovation, and the future of autos: the case of the North American value chain

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Outline

• Changes in auto industry since 1980s
• Rise of global value chains in the North American auto industry
• Implications of GVCs for innovation and employment: three views
  • Enabler of multinational-led development
  • Driver of race to the bottom
  • Provider of possibilities
• Role of global value chains in Gerpisa “productive models”
• Implications for national and corporate policies
Continuity and change in Nafta auto industry

1980s
- Innovation
  - Little in products
  - Significant productivity growth
- Employment
  - “Treaty of Detroit”
- Car of the Future
  - “World Car”
- Value chain
  - Integrated by company, separated geographically
  - Most “brain work” done by execs at OEMs

2010s
- Innovation
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Supply changes are growing in importance...

Large corporations have shifted from doing many activities in-house to a shared global supply chain of parts suppliers, R&D institutions, and assemblers.

**Benefit:** access to specialized suppliers

**Cost:** shared supply chains make it harder for individual firms to capture the full returns to their investment

**Implications:**
- Today, no one company can win by itself
  - Instead, success depends on healthy eco-systems
- Increased potential for government to act as catalyst
  - Convene, prime the pump with investments
Features of North American auto supply Chains

• Key input in manufacturing

• Interconnected networks of independent firms
  • Relationships are intermediate between “captive” (vertically integrated) and “arm’s-length”

• Largely domestic

• Small firms play an important role

• Potential key role for policy
Distribution of Manufacturing Input Costs, 2012
(as a percentage of total value of shipments)

- Materials: 54%
- Services & Expenses: 6%
- Contract Work: 1%
- Energy: 1%
- Payroll & Benefits: 13%
- Other: 25%

Supply chain inputs = 62% of total value of shipments

Source: Census Bureau, 2012 Economic Census
Historical Example of Vertical Integration: The Ford River Rouge Plant in 1941

Source: University of Michigan – Dearborn and Benson Ford Research Center
Supply Chain Evolution

Then: Vertically-integrated supply chain

Now: Supply chains have evolved to be complex networks of suppliers

Source: Economics and Statistics Administration
“Perfect Competition” & Supply Chains

• Perfect competition:
  • Many buyers & sellers of a homogeneous product
  • Prices are the only info shared across firms
  • If farmer Jones’s wheat is not available, can substitute farmer Smith’s wheat instantly

• Modern supply chains:
  • Products modified for different customers
  • Benefits to discussion about how to jointly optimize supplier’s equipment, customer’s design
  • Firms often incur significant costs of switching suppliers
Interdependence

• Ford CEO testimony before the US Senate:
  • “Ours is in some significant ways an industry that is uniquely interdependent—particularly with respect to our supply base, with more than 90% commonality. Should one of the other domestic companies declare bankruptcy, the effect on Ford’s production operations would be felt within days—if not hours.”
  • Alan Mulally
Domestic Content of Production in Manufacturing, 2012

Source: Economics and Statistics Administration analysis using data from the Bureau of Economic Analysis.
Manufacturing Employment Share from Small and Medium Sized Manufacturers

% of total U.S. manufacturing employment, 1977 to 2012

Source: Census Bureau Business Dynamics Statistics (2014)
How GVC’s affect innovation and employment

- Multinational-led development view
- Race to the bottom view
- Reform view
Development thru GVC participation

• This strategy contrasts with others, such as
  • Import-substituting industrialization
    • Withdrawal from global production is held to promote development by promoting infant industries.
  • Development of domestic supply chains via controlled engagement with foreign technology (eg, Korea, Japan).
Multinational-led development

• Multinationals are the best source of new technology and access to markets

• Thus, policies should focus on attracting MNCs
  • Assure protection of MNC assets (strong IP protection, special courts for investors).

• This view is often called the “free trade” perspective,
  • reducing barriers to trade such as tariffs are a key policy goal.
  • However, other elements of the proposed policies raise barriers to trade, eg, protection to intellectual property.
Evidence

• Japanese entry into North America in the 1980s brought increased consumer choice, lean production

• Did Nafta save Detroit?
  • “Without the ability to move lower wage jobs to Mexico we would have lost the whole industry ...There was a concern 20 years ago that an auto industry production chain would develop across Asia, including China and Taiwan and Southeast Asia.”

--Gordon Hanson of the University of California, San Diego
http://www.nytimes.com/2016/03/30/business/economy/nafta-may-have-saved-many-autoworkers-jobs.html
The “race to the bottom” perspective

• Multinational-led development → poverty trap
  • fierce competition to enter GVCs → firms that cut corners win contracts.

• 2013 Rana Plaza collapse in Bangladesh, in which 1200 people were killed.
  • Many lead firms signed up for extensive efforts to monitor suppliers. By 2015, international monitoring agencies inspected 3425 factories.
  • Only 8 have been remediated such that they passed the final inspection.
  • Subcontractors have moved much production to unregulated indirect suppliers.
    • Only 27% of Bangladesh garment factories in the export sector were subject to the accord. An NYU survey found 3 million more workers in the garment export sector than had been realized; these workers are not subject to the protections of the agreement.

• Large losses in developed countries as well
  • China’s entry into WTO → loss of 1-3M jobs in US, significant (and uncompensated) wage losses
Another side to GVC story

• “Voluntary Restraint Agreement” under Reagan led J to produce in the US, but with significant cost advantages compared to Detroit 3
  • Huge incentives for new plants
  • US labor law makes it hard to organize new faciltiies
  • Young workforce initially required low health, retiree expense

• In the 1990s, Mexican value added was very low -- less than 5%. Suppose Mexican labor is free; we get a savings of $5B, or 1% of the $500 B total US auto production. It seems hard to believe that a 1% savings is what kept the Detroit 3 from being bankrupted by the Asian supply chain.
  • Maybe the costs and distraction incurred in setting up Mexican supply chain stymied Detroit 3 efforts to build a collaborative, high-quality supply chain.
the broken link between wages and productivity in North America

• Mexico:
  • Bank of America Merrill Lynch study finds productivity has risen twice as fast as wages in Mexican automotive industry from 2005 to 2013
  • In 2003, Mexican auto wages were 188% higher than Chinese auto wages; now they are 19.6%.
  • But this has shifted because Chinese workers got raises and Mexican wages have stagnated.
  • Total labor costs, including wages and benefits, average 129 pesos (US$8) an hour in Mexico, compared to $58 in the US for GM and $38 at Volkswagen’s factory in Tennessee, the lowest hourly cost in the US, according to the Center for Automotive Research.

• http://www.reuters.com/article/economy-mexico-wages-idUSL2N0CR1TY20130404
Employment, Hours, and Earnings from the Current Employment Statistics survey (National)

Industry: Motor vehicles and parts
Data Type: AVERAGE HOURLY EARNINGS OF PRODUCTION AND NONSUPERVISORY EMPLOYEES
Gain to finance/speculators

• Delphi
  • 2009 inversion
  • Meeting hedge fund demands ➔ pension cuts for 20,000 white collar workers, closure of all Delphi UAW plants

• GM 2015 $5B stock buyback
  • Led by Harry Wilson, of Obama auto team
  • “GM did $20.4 billion worth of buybacks from 1986 through 2002. If it had saved that money and earned a modest 2.5% on it, the company would have had $35 billion on hand [in 2008]; probably would not have had to file for bankruptcy protection” HBR

• New plants in Mexico, US lured by tax breaks > 25% of amount invested; $100,000 / direct job
Underinvestment in autos

- 1/3 of auto supply chain employment is in firms with < 500 employees
- Low adoption of proven management innovations
  - Fewer than half of these auto suppliers have quality circles
  - Only 2/3 have consistent preventive maintenance
- 1/4 have no engineers
- Weak SMEs stymy innovation of whole supply chain
  - Only 1/3 of small suppliers engage in “value analysis” with major customer
  - Hence, lost access to info that small suppliers have from being close to production
    - Itron: reducing use of silver/cadmium in terminals for electric meters
      - 2011 Case Western survey, drivingworkforcechange.org
Reform perspective

• GVC participation won’t automatically allow emerging economies to capture wealth.

• However it is possible to avoid a “race to the bottom”
  • strong domestic institutions
    • Perhaps developed via ISI or controlled engagement in the past
  • trade agreements with technical assistance and monitoring
High-productivity, high-wage stamping firms:

• Consistently performed preventive maintenance
• Were more likely to have employees participate in quality circles
• Had higher % of sales from products designed by firm
• Had trusting relationship with major customer
Market failures in GVCs

• Productive eco-systems are hard to sustain thru private action alone.
  • When firms invest in their suppliers, they do not capture all of the benefits of doing so; firms that do not invest also benefit.
  • Due to this “free rider problem”, firms will underinvest in activities to upgrade suppliers by helping them invest in training, new products or processes

• These problems often exacerbated by “siloes” within firms
  • internal conflicts can mean a focus on suppliers with low piece price rather than those providing high quality and innovation
    • Quality and innovation are harder to measure, and their benefits often accrue to departments other than purchasing
Overcoming market failures in GVCs

• Nations that retain rich eco-systems have institutions such as:
  • subsidized research institutions and networks,
  • unions or works councils that promote use of “good jobs” strategies,
  • technical assistance providers

• Examples from garment industry
  • Rana Plaza accords, Bangladesh
  • OEM choices: Nike supplier training in Mexico
  • Trade agreements + NGOs + local govt: Cambodia Better Work
Key differences in perspectives

• Develop vs select
  • Too much protection: stagnation
  • Too little: high risk, long payback
  • Can we find policies that min risks of stagnation, maximize investment?
    • Target spillovers directly
    • Exports
    • Recognize value of knowledge overlap
      • Uncertainty $\rightarrow$ “relational contracts” $>$ arm’s-length markets

• Which assets should be protected?
  • Ideas, workers, environment?

• Role of institutions, history vs. exogenous role of technology
Policies for fair, innovative supply chains

• General “good jobs” / high road strategies
  • Reduce attractiveness of sweatshop-type outsourcing

• Specific policies for supply chains
  • Raise subcontractor productivity
  • make them less interchangeable by promoting collaborative strategies
    (instead of “race to the bottom” strategies)
White House Supply Chain Innovation Initiative

• Help overcome market failures by:
  • Better leveraging federal technology assets to promote innovation in supply chains
  • Highlighting private sector models that increase small-firm capability, and improve collaboration for innovation in supply chains
Gerpisa productive models

• Firm trajectories and performance result from interaction of government policies, 'product policy', 'productive organisation' and 'employment relationship'.
• There is no one best way
• No one factor drives the others
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Innovation, employment, and GVC’s

- Trade agreements + weakened labor institutions+ improved transport and communication $\rightarrow$ incentives for de-integration of supply chains
- Innovation outside the industry + technology-forcing environmental regulation $\rightarrow$ innovation diffused across industry via shared suppliers
- De-integration of supply chains + difficulties in sustaining collaboration $\rightarrow$ reduced innovation, investment by suppliers
Production-related issues remain important, even in world of i-car, e-car

• Quality remains a challenge in era of increased complexity, cost pressure
  • Takata airbag
  • True emissions reductions

• Autos long a bellwether for trends in technology and employment
  • $5 day
  • Toyota production system
  • Globalization that increases choices for consumers, extends corporate power, increases competition faced by workers
Why should we care?

• To promote equitable growth, it is important to understand how the economic pie is created—not just how it is divided.

• Rise of supply chains with small, weak firms → increased role of firms that innovate less, pay less
  • Supply chain structure and relationships → key determinant of viability of “good jobs strategies”

• Supply chain firms could do better with better public and private policies
  • “race to the bottom” vs “collaborative” supply chain strategies