

The Systemically Important Auto Supply Chain

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Agenda

- The systemic importance of the auto supply chain
 - Large, interconnected, innovative
- Challenges in keeping it that way
 - Weakness in industrial eco-system
- Policies to improve
- Looking ahead

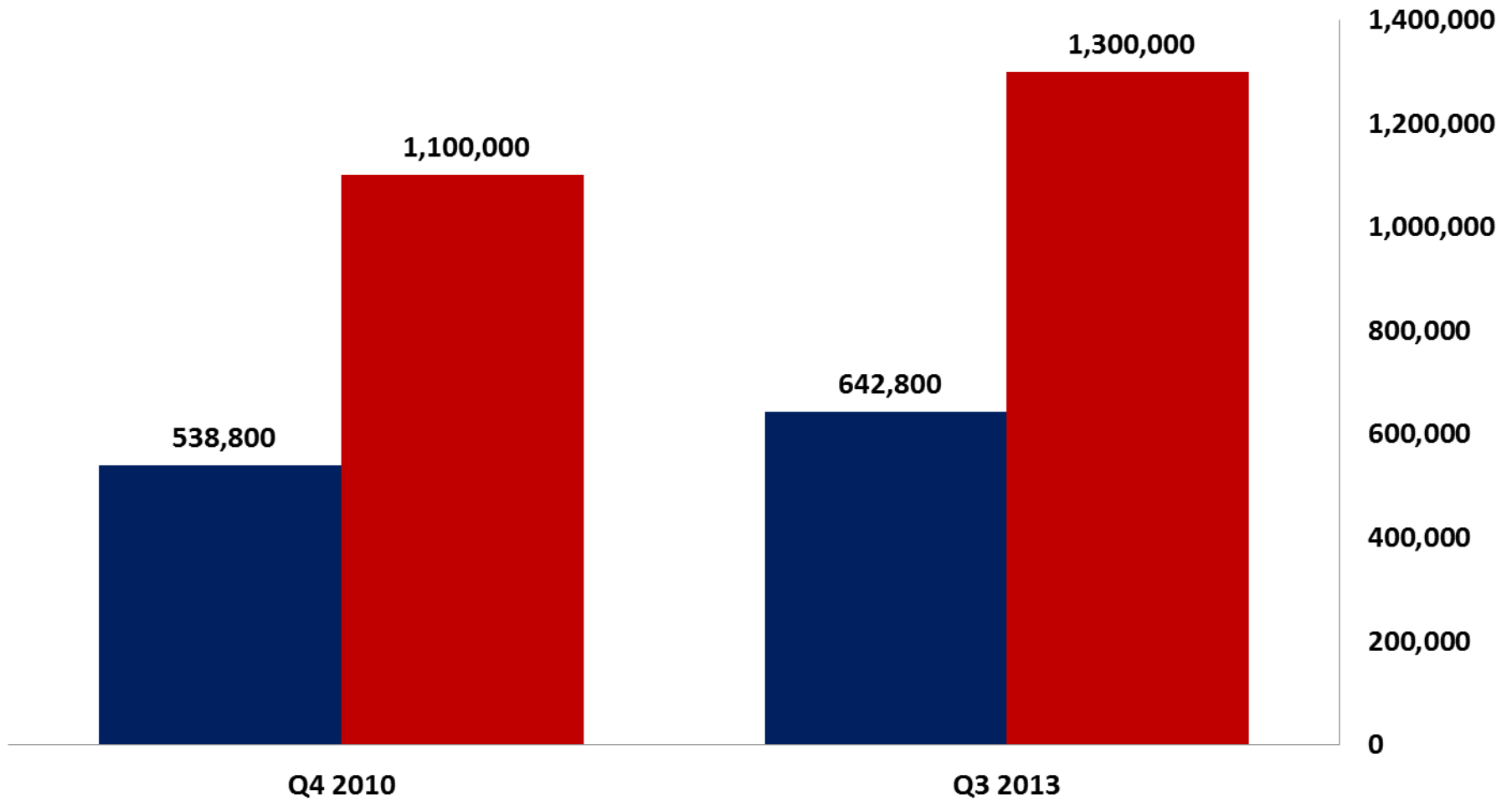
Large size of auto supply sector

Automotive Parts Supplier Employment

Q4 2010 and Q3 2013

Number of jobs

■ NAICS defined ■ CEA



- Employment in the auto supply sector is **twice as large as previously understood**:
 - NAICS 3363, 3362 Q4 2010: 538,800 jobs
 - New estimate: 1.1 million
- More comprehensive calculation includes:
 1. Factories that make auto parts.
 2. Headquarters or technical centers belonging to firms that manufacture auto parts.
 3. Producers of specialized equipment for automotive production.
 4. Regular and temporary workers at each of the above workplaces.

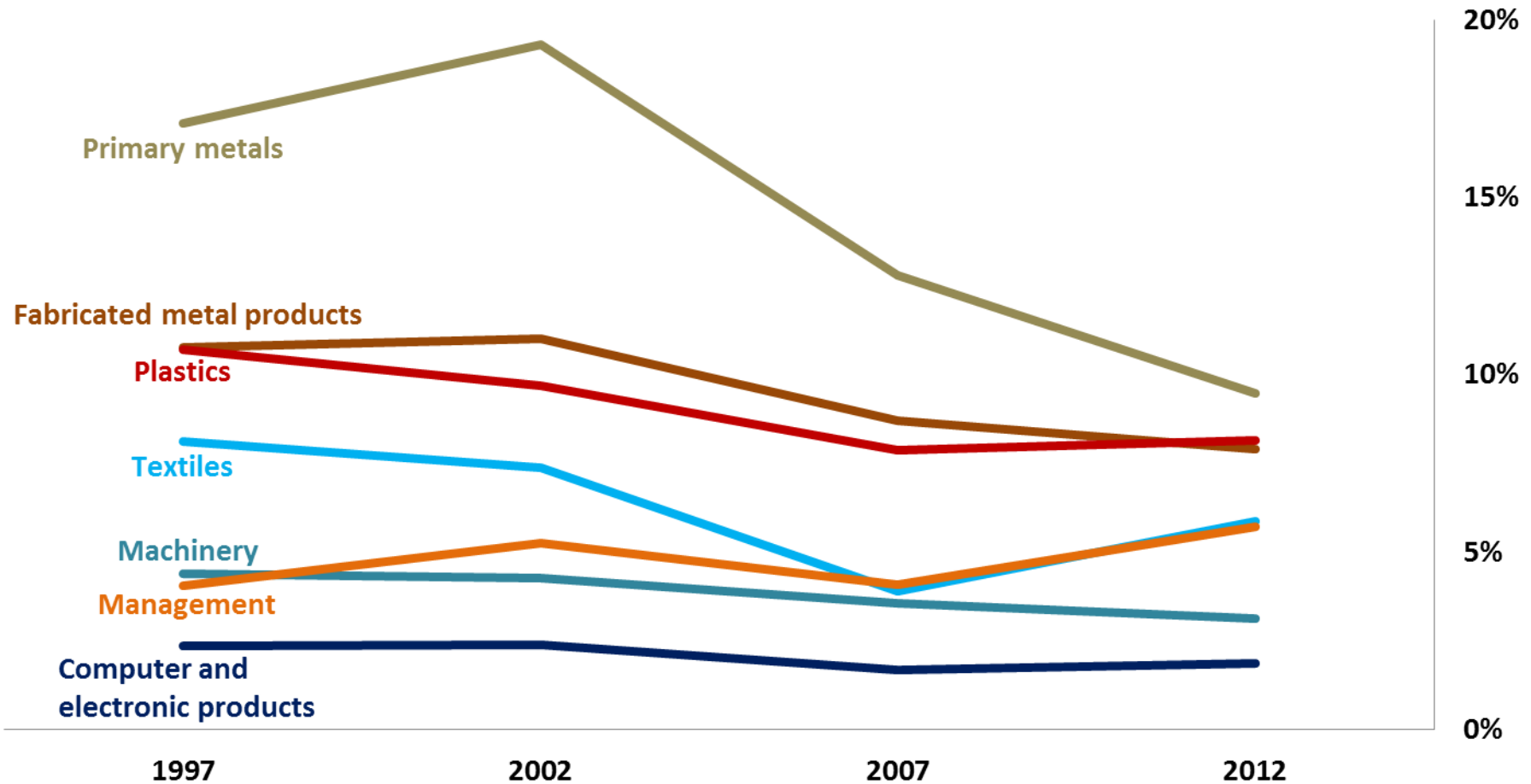
Forthcoming analysis, U.S. Department of Commerce

Large size of auto supply sector

Domestic Uses of Selected Commodities by Motor Vehicle Industry

1997 - 2012

Percent of domestic commodity output



Source: BEA

Note: BEA classifications in each industry: Primary metals - 331; Fabricated metal products - 332; Machinery - 333; Computer and electronic products - 334; Textiles - 313TT; Plastics - 326; Management - 55.

Note: \$100 of computers in 1997 would cost \$25 in 2012.

High degree of interdependence in auto supply sector

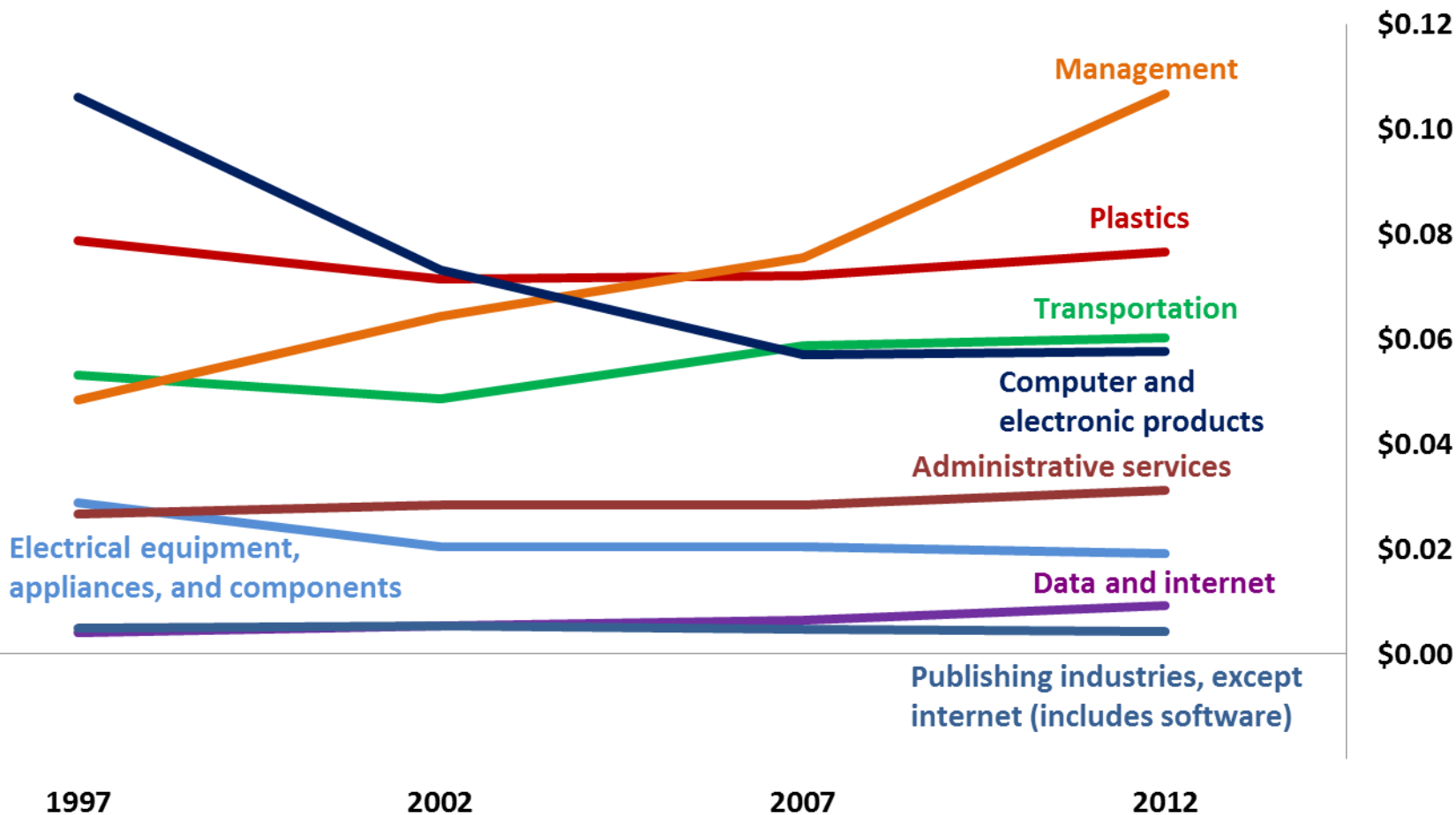
- Three factors contribute to a high interdependence:
 - Shared suppliers
 - High levels of co-production
 - Time dependence
- About two-thirds of the value in “Motor vehicles, bodies and trailers, and parts” is created by industries other than the “Motor vehicles, bodies and trailers, and parts” manufacturing industry.
- Capability of the suppliers and coordination with Original Equipment Manufacturers (OEMs) are a key determinant of quality and innovativeness.
- Interdependence made the 2008 crisis particularly perilous.
 - Contagion from financial troubles at one firm in the industry could easily have spread to others.
 - Thus the Administration’s auto rescue efforts had even greater impact than many had previously recognized.

High degree of interdependence in auto supply sector

Selected Industry Contributors to Motor Vehicle Production

1997 - 2012

Dollars spent on \$1 of motor vehicle output



Source: BEA

Note: BEA classifications in each industry: Computers - 334; Electrical - 335; Plastics - 326; Transportation - 481, 482, 483, 484, 485, 486, 487OS; Publishing - 511; Data and internet - 514; Management - 55; Administrative services - 561.

- Although the industry is “old,” auto suppliers remain innovative:
 - Modern vehicles contain 150 computerized controllers and 10 million lines of software code.
 - Advanced materials developed for autos such as lightweight steels and innovative plastics find uses in many other industries.

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Structural Changes in U.S. Manufacturing

- 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 even harder for individual firms to capture the full benefits of their investment
 - **Implications:**
 - Today, no single company can win alone.
 - Success depends on healthy eco-systems.
 - Increased role for government to act as catalyst.
 - Convene, prime the pump with investments.

Underinvestment

- One-third of auto supply chain employment is in firms with fewer than 500 employees.
 - Few supports for them to upgrade.
- Fewer than half of auto suppliers have quality circles, consistent preventive maintenance.
- 30% have no engineers.
 - *2011 Case Western survey, <http://www.drivingworkforcechange.org>*
- Industry depends on these weak lower tiers.
- Yet, incentives for purchasing personnel don't match collaboration goals, especially for tiers 2 and 3.

Spillovers in Manufacturing

Point of Market Failure	Explanation
Investment in Basic Research	R&D has spillover benefits for innovation and productivity that cannot be captured by any single private actor. Without policy support, this could lead to significant under-investment.
Technology Transitions	Firms going from lab to market in a new technology must solve similar problems. Pre-competitive collaboration among companies avoids duplication and saves time.
Supply Chain Health	Lead firms sharing suppliers face a dilemma if they act individually: if they invest in suppliers, they risk giving away the fruits of their investment to their competitors (who did not share their costs). Thus, these large companies have a disincentive to independently invest in their suppliers.
Training	A key to building an economy that provides profits for business and rebuilds the middle class is to have highly productive firms and workers. The U.S. needs to increase training levels, both to maintain our skill levels and to build the highly-productive, IT-driven economy we would like to have in the future. Firms paying for training face “free-rider problems” similar to those above.

Encourage industry clusters

- Stronger industry clusters lead to greater growth in:
 - Employment;
 - Wages;
 - Patenting; and
 - New regional industries.

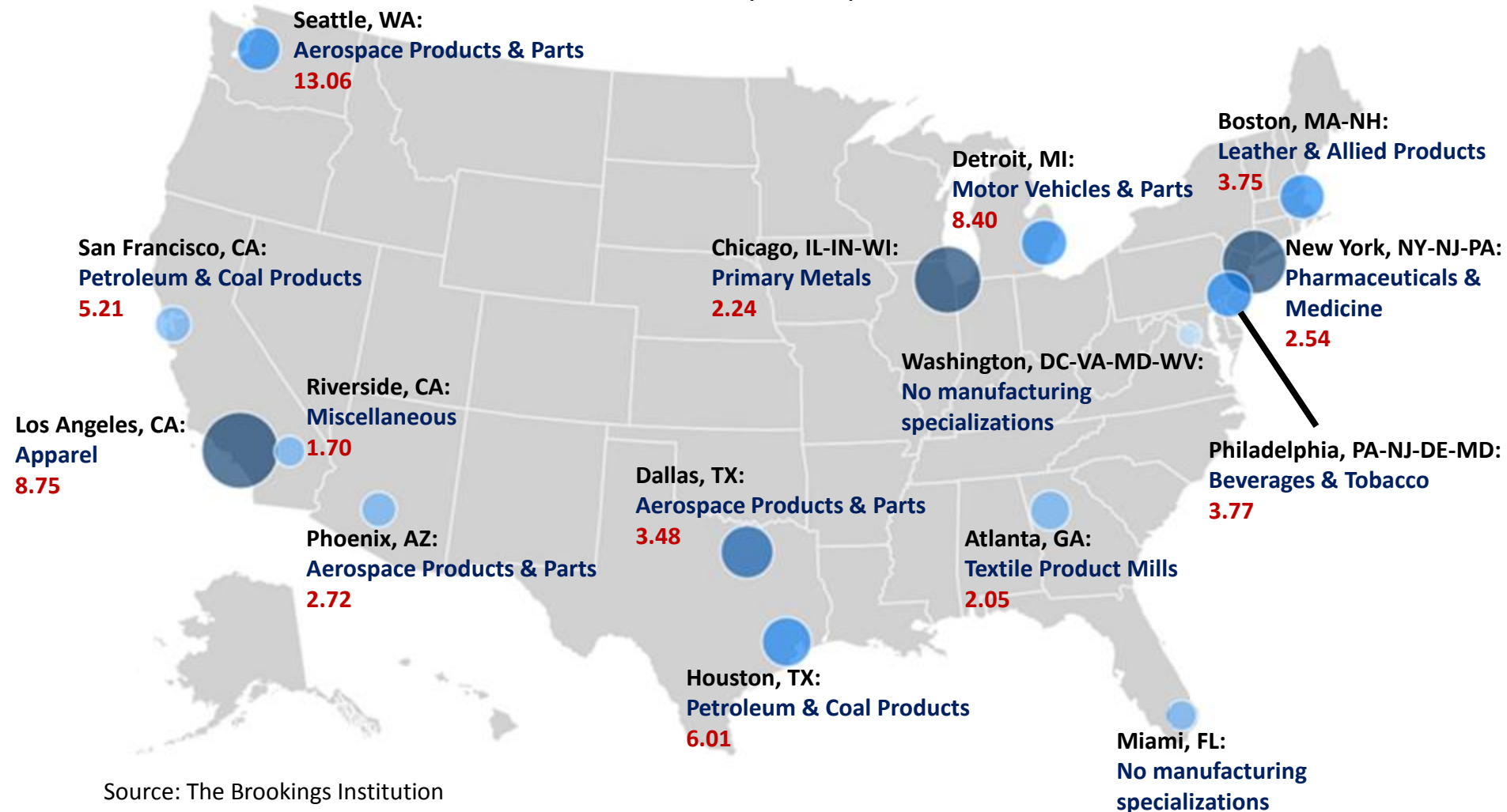
– *Delgado, Porter, and Stern, 2012*

Policy can promote these spillover benefits

Top Manufacturing Industry Specializations for 15 Largest U.S. Metro Areas

2010

U.S. metro area, industry, and specialization value



Source: The Brookings Institution

Note: The values indicate specialization, a relative measure defined as the share of manufacturing jobs in a metro divided by the share nationwide. Values greater than one indicate specialization.

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IMCP and NNMI

- Investing in Manufacturing Communities Partnership (IMCP)
 - Create a “race-to-the-top” in manufacturing economic development.
 - Build durable “industrial ecosystems,” aligning industry needs for worker training, research, supply chains, capital access, infrastructure, and trade.
 - Focus catalytic levels of resources, coordinated across the federal government, on winners to build shared prosperity.
 - Contrasts with “smokestack-chasing” (incentives to individual firms).
- National Network for Manufacturing Innovation (NNMI)
 - A proposed collection of commercialization hubs, owned and operated by universities and corporations, that collaborate on applied research, conducting training on new technologies.

The Investing in Manufacturing Communities Partnership is designed to drive best practice locally-led economic development strategies

1

Taking Stock

- Help a local community or region identify its comparative strengths and **develop a plan to guide long-term investments in public goods**, such as research institutions, specialized community college centers, and transportation infrastructure.

2

Investing in Public Goods

- Provide **catalytic funding, which can be matched by industry and localities, to seed these economic strategies**.
- **Leverage best practice principles** to coordinate regional economic development.

3

Advancing Sustainable Growth

- Investments plus interaction among stakeholders create lasting local assets like workforce skills, efficient transportation and energy networks, research, and private investment.
- **Multiple advantages of being in an ecosystem make investments “sticky”**—firms benefit more by staying in/re-locating to area.
- Incentivizes broad transformation – even among non-IMCP winners.

IMCP: 2 Auto Winners

- Yesterday, U.S. Secretary of Commerce Penny Pritzker announced the first 12 communities that will be designated Manufacturing Communities as part of the second phase of the IMCP.
- Two of the first 12 Manufacturing Communities are in automotive:
 - SE Michigan led by the Wayne County Economic Development Growth Engine
 - The Tennessee Valley led by the University of Tennessee
- Eleven federal agencies with \$1.3 billion in economic development funds will be able to use the designees' plans to make targeted investments in demonstrably strong public-private partnerships to strengthen regional manufacturing.
- Each designated community will also receive a federal liaison and promotion as a designated Manufacturing Community to help attract additional private investment and partnerships.

Advance Michigan

- The 13-county Southeastern Michigan region represents 22% of the motor vehicles made in the U.S. and takes in over 70% of the spending on U.S. auto R&D.
- Vision: create shared assets that promote vehicle connectivity and efficiency.
 - Training in electronics and new materials
 - Supplier upgrading
 - Innovation, infrastructure, capital

Conclusions

- The auto supply chain remains systemically important to the U.S. economy
 - Large, interconnected, innovative
- Challenges in keeping it that way
 - A key problem: coordinating investment to strengthen industrial eco-system
- Policies to improve
 - IMCP: Pump-priming to help communities build partnerships to build shared assets, capture spillovers
- Challenges remain

Thank you.

