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Building a Strategy for American Innovation: Proposed Elements

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This paper proposes an approach to building the Federal capacity to strategically assess and address the state of U.S. economic competitiveness, particularly in the realm of innovation. It begins by describing the rationale and principles of approach and then suggests activities in four categories. Two focus on creating the information and data resources that the White House needs to:

- assess the **current state of U.S. competitiveness and innovation** and
- shape, implement, and evaluate **federal policies and programs** aiming to improve the nation's economic performance.

The second two categories propose White House activities that directly promote competitiveness and innovation:

- organize in-depth analyses of the competitive strengths and weaknesses of **individual traded industries** and the implications for federal policy and
- encourage improvements among the **broad drivers of competitiveness and innovation**, particularly human capital.

Rationale

- The nation's economic well-being is determined by the ability of U.S.-based business establishments to sell goods and services in increasingly competitive international markets.
- These establishments' competitiveness depends on their capacity to innovate—to provide customers with goods and services with unique characteristics, at an attractive cost, and with superior service.
- Market mechanisms on their own cannot provide businesses with adequate access to a number of resources important to competitiveness. Historically, examples of such resources include new general purpose technologies (GPTs), transportation and communications infrastructure, skilled and educated workers, financial capital, basic and applied research, product standards, collaborative networks, socioeconomic data for decision-making, reliable market operations, frameworks for dispute resolution, and macroeconomic stability.
- The Federal government always has played an important role in facilitating business access to important resources not adequately provided through market mechanisms, that is, a role in helping markets work better.

- Between 1789 and 1932, Congress regularly sought to develop an integrated, organized approach to competitiveness policy.
- Subsequent to the decline of postwar U.S. economic hegemony in the 1970s, Congress and several administrations have periodically put forth an array of competitiveness-related policies and programs. However, these have not been designed, managed, and monitored in an integrated fashion.
- Reports from the Commerce Department, the Information Technology and Innovation Foundation, the Center for American Progress, and others suggest that recent efforts to promote competitiveness largely have fallen short of their intended results.
- At the same time, other industrialized and industrializing nations—such as China, India, Singapore, Taiwan, Germany, and Finland—are actively developing and implementing comprehensive national competitiveness and innovation strategies.
- It is in the nation’s economic interest for the Federal government to more systematically and strategically assess the nation’s competitiveness and capacity to innovate and encourage improvements on the basis of these assessments.
- Further, such actions will aid the American public in understanding the importance of investing in building the nation’s base of assets, including its people. A set of evidence-based competitiveness policies can lead to a much broader sense of “we,” and a much reduced sense of “them,” within the nation.

Principles of Approach

Because global markets change quickly, successful business competitors must be knowledgeable, entrepreneurial, innovative, strategic, and collaborative. To effectively promote economic growth, the Federal government needs qualities as well. Consequently, I suggest the White House competitiveness and innovation strategy effort rely on the following principles of approach:

Knowledgeable. The White House requires access to an “economic intelligence network” of Federal agencies and other organizations that provides it with regularly updated information on:

- The structure of the traded sectors of the U.S. economy
- The competitive strengths and weaknesses of these sectors
- The strengths and weaknesses of the systems that drive competitiveness and innovation, such as workforce development, R&D, and communications infrastructure
- Federal policies, programs, and staff resources available to promote competitiveness and innovation
- The relative efficacy of alternative approaches to competitiveness and innovation policies and programs

The role of White House staff is to request, receive, assess, and integrate information prepared by others.

Innovative and Entrepreneurial. The White House should encourage responses to economic intelligence that are creative, adaptive, and flexible, not linear, formulaic, or prescriptive. The White House can encourage experiments, particularly if they are low-cost and the learning can be captured.

Strategic. The White House oversees the development and implementation of Federal competitiveness and innovation strategy. In doing so, it should encourage the design of competitiveness and innovations policies and programs with high impact relative to fiscal cost, keeping two dimensions of strategic action in mind.

First, it should promote information- and relationship-based efforts, as these have the potential to influence very large numbers of decision-makers at very low cost. As a corollary, it should rely on efforts with greater expense or transaction costs (i.e., grants, tax credits, regulation, procurement) when lower-cost options are not feasible.

Second, it should seek to more effectively utilize existing Federal resources and leverage the presence and interests of non-Federal actors and resources before it seeks to invest new Federal resources.

Collaborative. To the last point, the White House should encourage and facilitate the development of inter-organizational networks—across the Federal government and with outside organizations—as a key means of intelligence gathering and policy development and implementation. Outside organizations can include trade and industry associations, universities, other research organizations, and businesses.

Historical Precedents.

- The Federal government’s approach to competitiveness policy from the 1790s to the 1890s aimed to be knowledgeable and strategic.
- From the 1890s through World War II, the approach increasingly was innovative, entrepreneurial, and collaborative. While a number of efforts to enhance the nation’s economic structure were ad hoc in nature (e.g., development of the aeronautics, chemicals, and radio industries), others were systematic (e.g., U.S. Commercial Service, U.S. Chamber of Commerce, War Industries Board, the Bureau of Foreign and Domestic Commerce, National Industrial Recovery Act).
- The various efforts in the latter period were actively and equally championed by Republican and Democratic Administrations and Congresses.
- Attention to strategic “bottom-up” Federal competitiveness and structural economic policies diminished after World War II in light of near-total U.S. dominance of world manufacturing, the development of the National Science Foundation as the primary (“top-down”) mechanism for stimulating innovation, and the emergence of

macroeconomic policies to manage the business cycle. For 70 years, the Federal government and the economics profession have tended to assume that ensuring stable economic conditions was generally sufficient to enable markets to make needed structural adjustments.

- I believe the Federal government would find value in re-inventing an effective direct, strategic approach to structural policy.

Implications. The proposed approach:

- aims to build the Federal government's capacity to strategically assess and address competitiveness issues and opportunities;
- will require the development of new skills, habits, and culture among Federal staff over a number of years;
- can be implemented at a pace consistent with available resources;
- can guide the President's annual budget process through providing evidence-based rationales for competitiveness-enhancing investments;
- can be supported by both political parties as it:
 - works closely with business organizations;
 - generates the information needed for good decision-making while giving any Administration full flexibility to craft decisions consistent with its views and values; and
 - provides a framework for action by the next Administration, regardless of party;
- should lead to regular communications with Congress on competitiveness issues and opportunities;
- plays to traditional American cultural strengths, ones that brought the nation to economic greatness in the first place; and
- reflects the fact that the speed of change in global markets outstrips the ability of any government to produce a fixed list of strategic actions that remains complete and fully relevant over time.

Areas of Strategic Activity

The following section lays out a series of actions that provide the foundation for and initiate implementation of the proposed approach. If I can obtain foundation funding for my time and that of graduate research assistants (which I believe is likely), I'd be able to assist these efforts.

1) General Resources for Assessment of U.S. Competitiveness and Innovation

An effective national competitiveness and innovation strategy must be based on an accurate reading of the nation's economic competitiveness. While existing data and information resources can provide a basic outline, a set of relatively small strategic investments can greatly enhance the Federal government's analytic capacity. Topic areas include:

- an overview of the structure of the U.S. traded sector
- a working picture of the nature, importance, and drivers of competitiveness and innovation
- indicators of U.S. competitiveness
- improvements in economic statistics

a) The Structure of the U.S. Traded Sector – An Overview

- What – Prepare a simple statistical summary of the structure of the traded portion of the U.S. economy (those sectors that compete in international markets), including the relative importance of various industries and how the economic structure has changed over time. Examples of sector-specific measures are employment, total wages, revenues, profits, and location quotients.
- Why – The traded sector forms the nation’s economic base. The statistical overview will highlight economic contribution, strengths, and weaknesses by industry.
- How Much – No additional expenditures
- Who – Office of the Chief Economist, Economics and Statistics Administration, Commerce Department
- How -- The key initial task is to develop a method for identifying fully traded, partially traded, and non-traded industries. This can be done using existing trade statistics. The subsequent analysis would be based on a combination of BEA, BLS, and Census industry statistics.
- When – Monthly update
- Level of Effort –Once the methodology is developed, the level of effort is low—a few hours each month.
- Trigger – The White House would specify the nature of the analysis it seeks. I’m willing to prepare draft the specifications.

b) Working Picture of the Nature, Importance, and Drivers of Competitiveness and Innovation

- What – Prepare a picture (schematic, backed by text) of the nature of competitiveness and innovation, their importance to the nation’s economic health, and their sources (drivers)
- Why – To create the rationale, basis, and support for Federal strategies to encourage competitiveness and innovation
- How Much – No additional expenditures
- Who – One or two Federal economists in the White House or ESA
- How – Literature review, compilation of working theory, identification of implications for Federal strategy. (Consider using my Feb 2014 work as a starting point: "[The Impacts of Technological Invention on Economic Growth – A Review of the Literature.](#)")
- When – 2015, update regularly thereafter
- Level of Effort – Several person-months

- Triggers – NEC/OSTP would specify the nature of the analysis it seeks. I’m willing to draft the specifications.

c) Indicators of U.S. Competitiveness

- What – A detailed series of indicators of U.S. competitiveness, innovation, and their drivers, relative to other nations. The structure of the report would reflect current theory regarding the drivers of competitiveness and innovation (per 1b above).
- Why – It’s useful to see how the dimensions of U.S. competitiveness compare to other nations—for purposes of strategy, policy, communications, and to see how other nations and traded firms see the nation as a competitor and place to do business.
- How Much – No additional expenditures
- Who – Office of the Chief Economist, Economics and Statistics Administration, Commerce Department
- How – Initially, ESA would adapt and update my March 2014 report, [“Indicators of the Capacity for Invention in the United States,”](#) which pulls measures from ten annual global indicator reports.¹ ESA would update the indicators as new annual reports are issued.
- When – Rolling update
- Level of Effort – Several days’ work would be needed to develop an indicator set that reflects current understanding of the drivers of competitiveness and innovation level of effort and is useful to NEC and OSTP. Once the structure is in place, the average monthly level of effort to update the measures is a few hours.
- Trigger – The White House would request that ESA produce and regularly update this report. I’m willing to assist in developing the initial report.

d) Improvements in Economic Statistics

The value of the nation’s economic intelligence network very much depends on the quality its economic statistical system. To too large an extent, the current system is geared towards:

- cyclical policy, not structural policy;
- the domestic manufacturing economy, not services and foreign trade; and
- using surveys, not making full use of Big Data and advanced IT.

As a result, the Federal government is unable to obtain a current, detailed, accurate picture of U.S. economic activity and competitiveness. The efforts suggested below would address this deficiency at very low cost. Proposals for each are available now. To get them moving,

¹ Indicator topics in this report include research and development, human capital, patent policies, free trade, presence of young firms, rate of worker hires and quits, societal values and attitudes, and national innovation agency and strategy.

the White House role would be catalytic—indicating its strong interest, giving direction, requesting periodic updates, and in several circumstances, supporting a small initiative in the President’s annual budget request. I’m available to facilitate these efforts.

- Innovation Accounting

Economic accounting practice has traditionally linked inputs of capital and labor to the output of consumption, investment, net exports, and government output in the context of the circular flow of products and payments. No explicit account was taken of the innovations in technology and the organization of production that led either to a greater quantity of output from a given base of inputs or improvements in the quality of the inputs and outputs.

In 2008, the U.S. Bureau of Economic Analysis decided to include certain types of R&D expenditures in the national accounts, a useful but insufficient step forward for understanding the sources of economic growth. It continues to maintain an [R&D Satellite Account](#).

In the last few years, several economists, particularly Carol Corrado and Charles Hulten, have sought to devise an alternative approach that more fully identifies all major sources of growth. In 2012 (revised in 2013), Corrado and Hulten published a paper ([“Innovation Accounting”](#)) that “describes some of the steps involved in building a more comprehensive national innovation account as a satellite to the main national accounting framework.” A comprehensive innovation account would cover investment (“capital deepening”) in knowledge-based capital, including computerized information (software, databases), innovative property (such as R&D, mineral exploration, and artistic originals), and economic competencies (brand equity, worker training, organizational structure).

Currently available data are not sufficient for constructing a complete, accurate innovation account. Corrado and Hulten say that substantial improvements in economic data collection will be required to obtain a more complete and accurate accounting of the sources of economic growth. Of particular interest are improved data on investment in intangibles, the output or benefits of knowledge-based capital investments, and prices adjusted for changes in quality due to innovation.

- What – Selected improvements in BEA Innovation Accounts
- Why – Better ascertain the role of innovation in U.S. economic growth so to design more effective policies and programs
- How Much – A \$5 million annual increase in research would have a substantial impact
- Who – National Accounts Program, BEA

- How – To be determined by BEA researchers working with Corrado, Hulten, and others
 - When – As much thinking about this topic has been done to date, work could begin immediately. While full implementation would take a number of years, results could be seen very quickly.
 - Level of Effort – Substantial intellectual and analytic effort
 - Triggers – The White House would direct ESA and OMB to include a BEA budget initiative to improve innovation accounting.
- Firm-specific Data

Most available economic data are at the establishment level, not the firm level—both are needed for competitiveness analysis. Advanced IT now enables us to get much more information on firms, at low cost.

- Longitudinal Enterprise Database
 - What – Construct and regularly update a longitudinal enterprise database. Examples of possible data elements include industry, size, age, legal type, owner characteristics, locations, employment, payroll, sales/receipts, trade, capital spending, outsourcing, patents, finances, foreign operations of U.S. firms, and direct investment in the U.S. of foreign firms.
 - Why – By providing a much richer picture of activities of firms with economic activity in the U.S., a longitudinal enterprise database would significantly enhance the quality of economic intelligence. Currently, the Census Bureau maintains a [Longitudinal Business Database](#) (LBD), which integrates survey and administrative records of all U.S. business establishments over time. After decades of absence, it recently revived its [Enterprise Statistics Program](#), with datasets available or forthcoming from the 2007 and 2012 Economic Censuses. An internal working group proposed a more ambitious effort to build a longitudinal enterprise database that could generate data products profiling industry structure and dynamics. Topics could include firm size and type, foreign and domestic ownership, firm births and deaths, firm expansions and contractions, mergers and acquisitions, innovation, and outsourcing. A longitudinal enterprise database would aid industry analysts in examining, for instance:
 - the impacts of firm characteristics on firm and industry outcomes, by industry
 - the extent to which enterprises classified in one industry own establishments in different industries
 - the effect of technological change on corporate focus (e.g., IBM's shift to a services firm)
 - differences in industry and company performance

- patterns of evolution from non-employer to employer firms
 - How much -- \$600,000-\$1.2 million
 - Who – Center for Economic Studies, Census Bureau, with oversight from ESA
 - How – Integrating new Census and non-Census firm records as they become available.
 - When – Construct 2015-2016
 - Level of Effort – Moderate, relative to other Census Bureau activities
 - Triggers – The White House would express interest in the development of a longitudinal enterprise database and, if necessary, a corresponding Census budget initiative.
- Bulk Download Tool for SEC Filings
 - What – A tool that would enable the bulk download and analysis of SEC filings.
 - Why – Securities and Exchange Commission (SEC) filings are a rich source of information on the structure, relationships, activities, and locations of U.S. corporations. Text analyses of these public data can greatly enhance understanding of firm and establishment characteristics and their impacts on competitiveness. However, while SEC filings are publicly available, they are difficult to obtain in bulk because the agency's public access system, EDGAR (Electronic Data Gathering, Analysis, and Retrieval), is outdated and cumbersome. EDGAR's underlying technology has not been improved since 1997. While EDGAR accommodates text-based searching, it is not interactive—consequently, users cannot navigate directly to the data they need. The EDGAR system becomes more opaque as disclosure documents continue to grow longer, reflecting more complex business arrangements and new disclosure obligations.
 - How Much – The system could pay for itself through charging user fees.
 - Who – Office of Information Technology, Securities and Exchange Commission
 - How – See Jonathan F. Karp, ["Can the US Import 'Sunlight' from New Zealand?: An Assessment of New Zealand's Model for Corporate Financial Disclosure,"](#) August 2011.
 - When – 2015-2016
 - Level of Effort – Moderate, as the electronic filings and the download technology are readily available.
 - Triggers – The White House would seek information from government and other analysts about the value of high volume download of SEC data. On the basis of the answers it receives, it would determine whether to inform the SEC of its strong interest in making public SEC records more readily available for analysis.
- International Trade Data

At present, analysts have significant difficulty in measuring and assessing the full nature of economic relations between the U.S. and other nations. Modest investments in

existing BLS and BEA efforts to improve data can address this problem. The White House could consider organizing an interagency group of trade data-producing and –using Federal agencies to guide and coordinate the proposed work.

- Services Trade Data

- What – Provide detailed information on U.S. trade in services, by industry.
- Why – Despite the facts that trade in services comprises 22 percent of all U.S. trade and about seven percent of U.S. GDP, BEA’s trade in services data don’t have the same level of quality and detail as do trade in goods data.
- How Much – “A small investment of resources,” according to BEA.
- Who – International Economics Program, Bureau of Economic Analysis
- How – BEA implementation of a series of proposals made to Congress in 2010 in a report on the state of statistics on U.S. trade in services.² Proposals include:
 - Add new information on insurance, financial services, computer software, and manufacturing services, in line with international trade data standards
 - Expand existing surveys to collect data on U.S. firm operating characteristics and purchases of services from U.S. and foreign suppliers
 - Incorporate business characteristics from existing Census surveys
 - Increase survey coverage of small firms
 - Ensure that the BEA sampling frame is consistent with the Census Bureau’s Economic Census
 - Use existing data to determine the origins of imported services, for example, intrafirm trades and outsourcing by U.S.-based firms
- When – 2015-2017
- Level of Effort – Moderate
- Trigger – The White House would ask OMB to work with BEA to include an initiative in the agency’s budget request and actively support congressional approval of data synchronization legislation that would allow BEA to use IRS-derived data while fully protecting confidentiality.

- International Price Indices

- What – Develop an input price index; import and export price indices for services; and a foreign currency price index.
- Why – To more accurately measure foreign trade and to remove spurious increases in manufacturing productivity measures that occur when domestic production of inputs is moved off-shore.³

² Secretary of Commerce, in Consultation with the Secretary of Labor, “Report to the Committee on Finance of the Senate and the Committee on Ways and Means of the House of Representatives on Trade in Services Statistics,” January 2010.

³ BLS says it underestimates improvements in terms of trade and overestimating manufacturing productivity growth (by 10-20 percent) because it incorrectly attributes to greater productivity the drop in intermediate input

- How Much – About \$25 million annually
 - Who – International Prices Program, Bureau of Labor Statistics
 - How – Improved data collection and analysis
 - When – 2015-2018
 - Level of Effort – Significant
 - Triggers – OSTP and NEC signal the importance of developing these measures and ask OMB to work with BLS to fund the desired efforts.
- Global Value Chains and Trade in Value-Added
 - What – Develop the capacity to map global value chains (GVCs) and measure trade in value-added (TiVA)
 - Why – To identify the role that U.S. establishments and firms play in the world economy, their competitive strengths and weaknesses, and the implications for trade and competitiveness policy.
 - How Much – \$15 million annually (approximate)
 - Who – International Accounts and Industry Accounts Programs, BEA; Economics Directorate, Census; Office of Economics, U.S. International Trade Commission. Their current/recent efforts include:
 - ❖ BEA – [Update on BEA efforts to measure the economic impacts of Global Value Chains](#)
 - ❖ Census – [Longitudinal Firm Trade Transactions Database \(LFTTD\)](#)
 - ❖ U.S. ITC – “Services’ Contribution to Manufacturing” in [The Economic Effects of Significant U.S. Import Restraints, Eighth Update 2013](#).
 - How – First, BEA, Census, and USITC would continue to work with international working groups to create accounting frameworks and vet methods. Second, BEA and Census invest in new and improved data collection and utilization.
 - When – 2015-2020
 - Level of Effort -- Moderate
 - Triggers – The White House would indicate to BEA, Census, and USITC its strong interest in this work; ascertain the potential demand for GVC and TiVA data among Federal policy agencies; and as appropriate, ask OMB to support BEA and Census requests to fund work in this area.
- Data Synchronization
 - What – Pass a law allowing the Census Bureau to share IRS-derived data with BLS

prices that occur when a manufacturer shifts from a domestic to foreign supply source. This means that overall U.S. economic growth may not have been as strong as originally calculated, with “phantom” increases to GDP. It appears to be a particular problem for the U.S. computer industry. See William Alterman, [“Producing an Input Price Index,”](#) paper prepared for Conference on Measurement Issues Arising from the Growth of Globalization, November 2009, and Michael Mandel and Susan Houseman, [“Not all productivity gains are the same. Here's why.”](#), “What Matters,” McKinsey and Company, June 1, 2011.

- Why – Until recently, one-third of U.S. establishments have been classified by Census in one industry and by BLS in another. The prohibition on Census sharing IRS-derived records meant that BLS and Census could not adjust their records to be consistent, which in turn means that each agency offered a different picture of the structure of the U.S. economy. While Census and BLS recently determined that sharing multi-establishment firm files would not violate the law, passage of data synchronization legislation is still required to share single-establishment firms. Passage would enable the development of one profile of U.S. economic structure that is consistent across the Federal government.
 - How Much – Modest
 - Who – Census Bureau and Bureau of Labor Statistics
 - How – Comparing establishment records and making them consistent
 - When – 2015-2020
 - Level of Effort – Moderate
 - Triggers – The Bush and Obama Administrations have asked Congress to pass a data synchronization law for some time, to no avail. Draft language was prepared by the Senate Finance Committee a year ago in a [discussion draft](#) (see Section 71). The White House should continue to support a renewed effort.
- Big Data and Advanced IT

Census and BLS recognize that advancements in IT and Big Data analysis give them the opportunity to significantly expand data collection through the use of administrative and transactional data, at relatively low cost and with no new burden on survey respondents. Such efforts have the potential to substantially improve the nation’s economic intelligence network.

Recently, staff from [Census](#) and [BLS](#) each provided an overview of their respective explorations of opportunities. It is suggested that OSTP and NEC inform the statistical agencies of White House interest in monitoring, supporting, and facilitating these efforts.

2) Federal and Non-Federal Competitiveness and Innovation Policies and Programs

To design and implement an effective competitiveness and innovation strategy, the White House requires access to knowledge of current relevant policies, programs, and resources in the Federal government, at the State and local level, in national nonprofit organizations, and developed by foreign nations.

a) Reference Materials on Federal Competitiveness Policies, Programs, and Resources

- What – Provide OSTP and NEC with ready access to the following reference materials:
 - U.S. Code – sections focused on competitiveness and innovation
 - Executive Orders focused on competitiveness and innovation

- Profiles of Federal programs focused on competitiveness and innovation
- Directory of Federal economists and analysts with expertise relevant to competitiveness and innovation analysis
- Why – Competitiveness and innovation policies are crafted in the context of a complicated, idiosyncratic collection of relevant Federal laws, programs, and resources. New policies are more likely to be effective if decision-makers are fully aware, and take advantage, of this context.
- How Much – No additional expenditures
- Who – To be determined. My research assistants and I can assist in this effort. I have a set of initial materials gathered from the U.S. Code and a draft of a set of profiles of Federal innovation programs.
- How – Review of websites and reference tools, supplemented by conversations with experts.
- When – 2015
- Level of Effort – Perhaps three person-months.
- Triggers – To be determined in conversation with White House staff.

b) Reference Materials on Non-Federal Competitiveness and Innovation Policies, Programs, and Resources

- What – Provide OSTP and NEC with ready access to reference materials on non-Federal competitiveness and innovation policies, programs, and resources, including:
 - State and regional efforts to promote competitiveness and innovation
 - Nonprofit organizations that promote competitiveness and innovation
 - Foreign nation strategies to promote competitiveness and innovation
- Why – Knowledge of non-Federal efforts can spark useful policy and program ideas. Knowledge of state and local efforts will enable the Federal government to build on these efforts. Knowledge of foreign strategies can inform U.S. strategic decisions.
- How Much – No additional expenditures
- Who –
 - The Economic Development Administration can organize information on state and local efforts, with input from other Federal agencies such as SBA, NIST, and ITA.
 - Responsibility for the compilation of nonprofit organizations that promote competitiveness and innovation is to be determined. I can make available and update “[National Nonprofit Organizations That Inspire and Enable Invention and Invention-based Enterprises](#)” (February 2014).
 - ESA or NEC can be responsible for keeping track of foreign competitiveness strategies. I can make available, organize, and help update my recent compilation of such efforts.
- How – Review of websites and reference tools, complemented by conversations with experts (such as SSTI, International Economic Development Council, Council for

Community and Economic Research, Information Technology and Innovation Foundation)

- When – 2015 and regularly updated
- Level of Effort – Perhaps a person-year annually
- Triggers – To be determined in conversation with White House staff.

c) Strategy for Building Program Evaluation Capacity

- What – A strategy for building capacity within or available to the federal government to regularly assess the impacts of diverse efforts to promote competitiveness and innovation, building on existing efforts to the extent possible. Such efforts include:
 - Work of the OMB [Office of Performance and Personnel Management](#) to institute protocols for program performance evaluation
 - NSF’s [Science of Science and Innovation Policy Program](#)
 - The [STAR METRICS](#) Project at NIH
 - The [UMETRICS Initiative](#) of the Committee on Institutional Cooperation
 - Census Bureau Center for Economic Studies’ new Federal program evaluation effort⁴
 - Chief Performance Officer efforts in Commerce, Labor, and other Federal agencies
- Why – So that competitiveness strategies can be created on the basis of knowing what works, what doesn’t work, and why.
- How Much – No additional expenditures to develop the strategy. However, it is quite possible that strategy implementation will involve new expenditures.
- Who – To be determined
- How – The strategy would be developed through a working group. Test evaluations could be conducted as a means of ascertaining various approaches.
- When – Strategy development in 2015. Implementation of test approaches can begin quickly
- Level of Effort – For the strategy, minimal. Level of effort to implement the strategy likely would be more substantial.
- Triggers – The White House would charter an interagency working group.

3) Strategic Industry Analyses

At the same time that the White House is building a foundation of knowledge, it can initiate a process of strategic analyses of specific industries. As discussed in section 4 below, it also can take high impact, low cost steps to improve the workings of one or two key drivers of competitiveness and innovation, such as labor markets.

Strategic analyses of industry sectors have been conducted at the state and regional level and in foreign nations for decades. The Federal government systematically organized numerous

⁴ See [“U.S. Census Bureau’s Budget Estimates for FY2014 as Presented to Congress April 2013,”](#) pp. CEN-53-CEN-57.

similar studies in the first third of the 20th century; in recent decades, ones were periodically conducted in departments such as Commerce and Energy.

A strategic industry analysis measures a sector's economic contributions, assesses its competitive strengths and weaknesses, and provides a basis for addressing those findings. A good analysis is informative, accurately reflects market conditions, includes the input of a wide set of industry-related actors, and catalyzes public and private action. Typical elements of a strategic industry analysis include:

- a narrative description of the nature of the industry (e.g., nature of goods or services, uses, trends in technology development);
- a statistical description of the characteristics of the U.S. industry (e.g., jobs, revenues, number and characteristics of firms and establishments, geographic location, trade and markets, foreign affiliations);
- a listing of the major actors in the U.S. and global industries, including firms, key establishments, trade and professional associations, university research centers, Federal government agencies (e.g., regulatory, R&D);
- a statistical description of the global industry, trade dynamics, and the place of the U.S. in global activity (e.g., GVCs, TiVA, location quotients);
- an assessment of the key drivers of competitiveness (e.g., product qualities, transit speeds, labor costs, customer service);
- an identification of the competitive strengths and weaknesses of the U.S. industry—now and looking ahead;
- the implications of the competitiveness analysis for the future of the U.S. industry; and
- the elements of a U.S. strategy going forward, with identification of the roles of the various public, private, and nonprofit organizations.

I suggest that over the next two years, the White House seek to develop strategic industry analyses in order to test various collaborative approaches, assess the value the analyses, and begin to compile key industry overviews.

A first step would be to identify the essential characteristics of industry strategic analyses, e.g., concerning processes, products, and outcomes, as guidance to the teams it will commission. Desired processes might include industry participation. Desired outputs and outcomes might include certain types of competitive assessments, recommended strategies on the basis of those assessments, and a public-private framework for implementing strategies and periodically reassessing the industry. I'm willing to write a first draft of this.

A second step would be to identify the array of industries in which the White House is immediately interested. There's a strategic aspect to the choices, which should be informed by the overview of traded economic structure produced through 1a above. I can assist with this as well.

A third step would be to identify the approach to developing industry-specific studies. There are multiple possibilities—I lay out two quite different approaches below to stimulate our thinking.

One option is to commission one or two interagency industry study teams, outline a process for them to follow in 2015, assess how that effort goes, and repeat, and perhaps expand, in 2016. The aim is to slowly build up the Federal government’s capacity to prepare useful industry analyses and strategies.

As a wider, faster, less controlled, and more collaborative approach, the White House could issue a public request for proposals (RFPs) for strategic industry analyses; a description of the desired substance, process, and outcomes of the industry review (including options regarding industry involvement); and the criteria by which each proposal will be judged.

Eligibility to propose could be narrowly or broadly defined. At the broad end, proposals might, for instance, come from federal agency teams, academic institutions (including student-only teams preparing capstone projects), trade associations, consulting firms, and nonprofit research organizations. While winning proposal teams would not be paid, I believe many proposers would respond to other motivations. The White House would select a set of qualified proposers using diverse approaches to examine industries of particular interest.

At the exercise’s end, the White House and the Federal government would have gained a set of strategic assessments of a number of key industries, some understanding of the efficacy of various forms of public-private collaborative approaches to analysis, and a good amount of experience in the industry strategic assessment process. Numerous relations would have built between and within the public and private sectors. Hopefully, frameworks for public-private cooperation would be maintained over time. The nation would benefit from having a larger cadre of people knowledgeable in the process of strategic assessment.

The White House could add one more step to the process and make it a challenge in which final products would be competitively judged. In any case, the White House and select Federal agencies would have the responsibility for integrating the findings, developing appropriate strategies and encouraging their implementation, and determining the forms of future strategic assessments.

I’d be pleased to use the above as a basis for a robust in-person discussion about the nature of strategic industry analysis and alternative approaches to conducting them.

4) Drivers of Competitiveness and Innovation

a) Driver Assessment and Priority-Setting

On the basis of the indicators analysis (1b above), White House staff would determine a near-term plan of action for addressing one or more of the drivers of competitiveness and innovation. In light of staff constraints, it’s certainly appropriate for such a plan to largely

involve minor revisions in and coordination of existing efforts. That said, I suggest that at a minimum the White House implement effective, low-cost, ready-to-go initiatives to expand human capital.

b) Human Capital

On July 22, 2014, the White House initiated two ambitious efforts to substantially increase the nation's level of human capital:

- President Obama signed the [Workforce Innovation and Opportunity Act \(WIOA\)](#) into law. Unusual in this period of partisan rancor, the bill received near unanimous bipartisan support, passing the House 415-6 and the Senate 95-3.
- Vice President Biden issued "[Ready to Work: Job-Driven Training and American Opportunity](#)," a response to the President's direction in his 2014 State of the Union address for the Vice President to "lead an across-the-board reform of America's training programs to make sure they have one mission: train Americans with the skills employers need, and match them to good jobs that need to be filled right now."

These mutually reinforcing efforts have in common an information- and data-driven approach aim to promote workforce development. Specifically:

- WIOA affirms the Secretary of Labor's responsibility to "oversee the development, maintenance, and continuous improvement of a workforce and labor market information system that includes—(A) statistical data . . . that . . . enumerate, estimate, and project employment opportunities and conditions at national, State, and local levels in a timely manner . . . (B) information on State and local employment opportunities, and other appropriate statistical data related to labor market dynamics."⁵
- The Secretary is to carry out these duties in collaboration with the States, which are to maintain a statewide workforce and labor market information system and regularly consult with State and local employers, educational agencies, workforce investment boards, and participants regarding information needs.
- Vice President Biden's "Ready to Work" report specifies a "job-driven training checklist" for use by Federal, State, and local workforce training programs and Federal economic development programs. Several checklist elements are information-driven and rely on data provided through the workforce and labor market information system mandated by WIOA. These tasks include:

⁵ The legislation says that the information provided through (B) shall include job vacancy listings by labor market area, information on job skills necessary to obtain vacant jobs, and information relating to local occupations in demand and the earnings and skill requirements for such occupations.

- Determine skills sought by local employers and design training programs responsive to those needs.
- Use data to understand the nature of current and projected local, regional, State, and national labor markets, including types of jobs available and their educational and skill requirements.
- Give job seekers the information they need to choose programs and pathways that work for them and are likely to result in jobs.
- Measure and evaluate employment and earnings outcomes to help job seekers choose among training programs and help programs improve outcomes.⁶

Beyond guiding implementation of the “Ready to Work” report, it is suggested that the White House promote increased human capital through:

- creating the institutional foundation for information-driven labor markets and workforce training;
- supporting specific high-impact, low-cost initiatives in workforce statistics;
- and participating in the planning and implementation of the National Academies’ symposium, “Education, Training and Certification Pathways to a Skilled Technical U.S. Workforce,” to be held in mid-2015.

These initiatives are described below. I am willing to assist with each of them.

- Foundation for Information-Driven Labor Markets and Workforce Training
 - What: The Secretary of Labor’s development and maintenance of a nationwide cooperative Federal-State workforce and labor market information system, as required by WIOA and set forth in 29 USC 491-2, as amended.
 - Why: Enable students, workers, educators, trainers, employers, workforce investment boards, and Federal, State, and local governments to make well-informed regarding participation and investments in the labor market. More specifically, fulfill a WIOA mandate and facilitate effective implementation of the recommendations in “Ready to Work.”
 - How Much: To be determined on the basis of an analysis of the resources required to fulfill the Secretary’s mandate and a comparison with the current information-supporting resources allocated to BLS and ETA. That said, my initial estimate is about \$170 million above current budgets—\$60 million for internal BLS use, \$70 million for additional BLS and ETA grants to the States, and \$40 million for internal ETA use. (The total amount of BLS and ETA grants to State LMI agencies fell from \$110 million in FY2005 to \$100 million in FY2014.)

⁶ The White House, “Ready to Work: Job-Driven Training and American Opportunity,” July 2014, pp. 29-30.

- Who: Office of the Secretary of Labor working “[t]hrough the Bureau of Labor Statistics and the Employment and Training Administration, and in collaboration with States.”
- How: As laid out in the two-year plan required of the Secretary of Labor, per 29 USC 49I-2⁷
- When: Immediate initiation, ongoing implementation
- Level of Effort: Substantial
- Triggers:
 - The White House would indicate to the Secretary of Labor its strong interest in the fulfillment of 29 USC 49I-2.
 - The White House would direct the Department of Labor and OMB to include in the President’s FY2015 budget request of sufficient funds to implement 29 USC 49I-2.
- Strategic Improvements in the Nation’s Workforce and Education Statistics System

It is suggested that the White House promote the implementation of high-impact, low-cost improvements in select statistical programs concerning:

- occupations;
- administrative wage records;
- the workforce outcomes of educational programs; and
- non-degree postsecondary education and training (that is, industry-recognized certifications, occupational licenses, community college certificates, and on-the-job training).

These improvements would substantially aid the functioning of U.S. labor markets.

- Improved Occupational Statistics
 - What: Implementation of various initiatives being explored at BLS and ETA to improve occupational statistics, including:
 - redesign and expansion of the [Occupational Employment Statistics](#) (OES) survey sample to allow the creation of OES time series for the nation, States, and metro areas;
 - addition of new data elements in the OES;
 - [integration of OES with the National Compensation Survey](#) to allow the development of data by occupational skill level;

⁷ WIOA specifies that the two-year plan shall describe: the steps for developing the nationwide and State workforce and labor market information systems; the steps the Secretary will take to fulfill mandated duties; the performance of information system to date and planned improvements; involvement of the States in the plan’s development; and the extent to which advisory council recommendations are incorporated in the plan. The legislation also requires the Secretary to submit the plan to House and Senate oversight committees.

- expansion of ETA's [Occupational Information Network](#) (O*NET) to allow more rapid updating of occupational profiles;⁸ and
- match of OES data with those from the Quarterly Census of Employment and Wages (QCEW) and BEA to determine the characteristics of jobs provided through foreign direct investment compared to those provided by domestic employers with and without foreign affiliates.
- Why:
 - Improve understanding of current labor markets and the accuracy of occupational projections.
 - Allow students, workers, educators, trainers, employers, workforce investment boards, and Federal, State, and local governments to make well-informed decisions concerning occupations.
 - Enable valuable research on occupational trends in the nation, States, and regions.
- How Much: Approximately \$25 million annually (of which \$16 million would allow O*NET to be updated every two years rather than every ten).
- Who: BLS and ETA, with the State LMI agencies
- How: For BLS programs, completion of research and implementation of findings. For ETA, significant expansion of [O*NET update activities](#).
- When: As soon as possible
- Level of Effort: Moderate
- Triggers: The White House would communicate to the Secretary of Labor and OMB its interest in improving occupational statistics, consistent with the Secretary's data system responsibilities affirmed by WIOA.
- Unemployment Insurance (UI) Wage Record Enhancement
 - What: Select enhancement and standardization of State UI wage records. Potential additional variables include occupation, hourly wages, hours worked, weeks worked, gender, primary worksite, date of hire.
 - Why: Improve decision-making by students, workers, educators and trainers, employers, workforce investment boards, and governments. Increase

⁸ In a BLS information collection request made to OMB in 2013, the agency says: "Many employers already provide many data elements in their electronic OES report that we do not ask for. These data elements include information that is requested by customers, but cannot be provided by OES or other BLS surveys. For example, establishments report data items along with the occupation and wages such as: part-time or full-time status, hours, whether or not employees are exempt from the Fair Labor Standards Act, gender, age, EEO category, union status, specific job title, department, and others. While some of these occupational characteristics are available from other BLS sources, none are available for states and all areas, and in the case of demographic data, they cannot be associated with a particular employer's industry or size, and are not available for many occupations. . . . A Response Analysis Survey (RAS) conducted in 2011-12 showed that most employers are willing to provide additional data like hours worked and part-time/full-time status." Source: "[Supporting Statement: Report on Occupational Employment and Wages](#)," Part B. Collection of Information Employing Statistical Methods, July 2013, p. 10.

- understanding of labor market dynamics, particularly the workforce outcomes of individual educational programs and various educational paths.
- How Much: To be determined, in terms of costs to States and employers, with implications for Federal reimbursements.
 - Who: ETA and the State UI systems, with consultation and input from BLS, Census, and the State LMI agencies (which would be primary users of the wage records).
 - How: The BLS-State Workforce Information Council has commissioned the Administration Wage Record Enhancement Study Group to study the desirability and feasibility of wage record enhancement. The study group's final report is expected to provide a framework for implementation by the Department of Labor and the States.
 - When: The Study Group recently issued its first-year report and will undertake next steps, including communicating with employers and studying State wage record enhancement practices. After issuance of the final report, full implementation likely would take several years under the best of circumstances.
 - Level of Effort: Substantial
 - Triggers: It would aid the study group for the White House to indicate its interest in this work and note the relevance of the work to implementation of WIOA and "Ready to Work."
- Workforce Outcomes of Education and Training Programs
- What: Capacity to track the workforce outcomes of education and training programs. At present, the primary resource for tracking workforce outcomes is the UI wage record discussed above. (Social Security data also can be used.)
 - Why: Improve decision-making by students, workers, educators and trainers, employers, workforce investment boards, and governments.
 - How Much: Hundreds of millions to develop and maintain Statewide Longitudinal Data Systems (SLDS), less to link to existing wage records. Amounts will become more certain as state-specific efforts move ahead.
 - Who: State educational agencies, State LMI agencies, ETA, NCES, Census
 - How: Linking student records in SLDS with UI wage records. States require assistance to obtain the UI wage records of former students who leave the state. Options for obtaining and analyzing out-of-state data include [Wage Record Interchange System 2](#) and the forthcoming [Job-to-Job Flows](#) tool of the Census Bureau's [Longitudinal Employer-Household Dynamics \(LEHD\) Program](#). This Friday, I am facilitating a conversation between the Virginia SLDS manager and the Census Bureau's LEHD staff to explore options for

working together. If a collaboration is successful, Census might be in a position to provide a similar service to each State, on a reimbursable basis.

- When: Individual State efforts to link UI wage records with student records is ongoing. (See Oct 2014 Workforce Data Quality Campaign [report](#) of status of work by state.) Full development of SLDS-workforce linkages in all States will require at least another five years, if not more.
 - Level of Effort: Substantial
 - Triggers: The White House would indicate to the Departments of Education, Labor, and Commerce its interest in this work, particularly as it helps implement the “Ready to Work” report and WIOA’s mandate to the Secretary of Labor.
- Statistics on Non-degree Postsecondary Education and Training
 - What: Capacity to measure the attainment of non-degree postsecondary credentials (certifications, licenses, certificates) and on-the-job training (OJT) through surveys and administrative records.
 - Why: Determine the effects of non-degree credentials and OJT on worker employability and, on the basis of the findings, guide public policy and educational investments.
 - How Much: \$5 million-\$10 million annually
 - Who: BLS, National Center for Education Statistics, Census Bureau, ETA
 - How:
 - Adding questions to surveys: the Current Population Survey (BLS), the National Household Education Survey (NCES), and the Survey of Income and Program Participation and the American Community Survey (Census)
 - Developing agreements with [certification-providing organizations](#) to pool data on certifications granted (analogous to the Integrated Postsecondary Education Data System [IPEDS]) for degrees)
 - When: The BLS and NCES efforts will be implemented in 2015. A Federal effort to develop a database of certifications awarded could be accomplished over the 2015-2018 period. The desirability, feasibility, and timing of adding questions to the American Community Survey would depend on BLS and NCES experience with their surveys.
 - Level of Effort: Moderate
 - Triggers: The White House would indicate its interest in adding questions on non-degree education and training. White House inquiries about the feasibility of creating a certifications database could move that effort along; it is possible that a budget initiative would be required.

- Participation in and Utilization of the Upcoming Symposium of the National Academies' Board on Science, Technology and Economic Policy, [“Education, Training and Certification Pathways to a Skilled Technical U.S. Workforce”](#)
 - What: A symposium and accompanying report that provides information useful to the design of Federal policies and programs that promote the development of a skilled technical workforce.⁹
 - Why: Support more effective Federal STEM workforce development policies.
 - How Much: No new funds required.
 - Who: The “[c]ommittee will include labor market economists, education scholars, and people with practical experience in employee recruitment and corporate, federal, and state and local government-supported job training programs.” Funders include the National Academies, the National Science Foundation, the Department of Health and Human Services, and the Spencer Foundation.
 - How: Organize a symposium and prepare a report on the event.
 - When: 2015
 - Level of Effort: Modest
 - Triggers: The White House would express interest in providing input to the symposium agenda and in participating.

⁹ Project scope (from [website](#)): “An ad hoc committee will organize a national symposium to examine the coverage, effectiveness, flexibility, and coordination among the nation’s programs to prepare Americans for technically oriented, skilled positions in the workforce demanding non-routine problem-solving but not requiring a baccalaureate or higher degree. . . . The symposium is expected to feature presentations that will draw on accumulated research and practitioners’ experience to identify gaps in performance and in knowledge about workforce preparation in the United States and consider differences across sectors of the economy. Finally, it will also consider selected practices (e.g., European apprenticeship programs) in other countries and of foreign-headquartered corporations operating in the U.S. and their relevance to the U.S. and to domestic firms.”