

# Create a Dollar-Denominated, Macro-Level Innovation Measure

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*NACIE Recommendation, September 2015*

## 1. RECOMMENDATION

Innovation is the most important driver of prosperity. By definition, all innovations must contain a degree of novelty, whether that novelty is new to the firm, to the market, or to the world. Innovation is not just anything new; it must also include a viable business concept. Innovation can involve new products, services, and business models, provided that each can be realized in an actual market.

It would be extremely valuable to know the share of GDP growth every year coming from all three components: labor force expansion, increased productivity, and innovation. Knowing this would help policymakers understand whether U.S. innovation is accelerating, staying constant, or declining. Unfortunately, we currently don't know. This is why we can have a situation where some analysts argue that innovation is exhausted while others argue that it's accelerating. And there is no way to assess which, if either of these claims is actually correct using current measuring and reporting approaches.

NACIE therefore recommends that the Economics and Statistics Administration (ESA) within the Department of Commerce (DOC) (ideally in partnership with the National Science Foundation (NSF), the Department of Labor (DOL), and other relevant agencies) create an ESA-led, interagency working group focused solely on the development of a dollar-denominated measure of innovation to be incorporated into the measure of GDP via the National Income and Product Accounts (NIPAs).

## 2. CHALLENGES

We currently have no real way of assessing the pace of innovation nor how much of the overall U.S. economy's growth of the any one year is a result of innovation. The U.S. has essentially two separate measurement systems: one that measures particular innovation inputs (e.g., scientists, R&D, etc.) and another that measures intermediate outputs (e.g., patents, high-tech jobs, etc.). However, neither adequately measures the overall amount of innovation.

While the National Science Foundation's Business R&D and Innovation Survey has done good work to better measure inputs and intermediary outputs, this work by its very nature cannot be incorporated into the system of national economic accounts.

Other data sets present different challenges. For example, DOC's Bureau of Economic Analysis (BEA), which manages the NIPAs, measures (among other things) changes in GDP, while DOL's Bureau of Labor Statistics (BLS) measures labor productivity. The U.S. economics statistical system was established after World War II and was designed to help facilitate fiscal and monetary policy in order to avoid another Great Depression. As such, it measures things like the number of houses built and cars manufactured. It does not measure whether the houses and cars were more innovative or built using innovative methods. As the 2008 Advisory Committee on Measuring Innovation in the 21st Century argued, "[th]e NIPAs were not originally designed to measure innovation or delve into the causes of long-term productivity growth."<sup>1</sup>

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<sup>1</sup> The Advisory Committee on Measuring Innovation in the 21st Century Economy. *Innovation Measurement: Tracking the State of Innovation in the American Economy* at 7 (Jan. 1, 2008), available at [http://www.esa.doc.gov/sites/default/files/innovation\\_measurement\\_01-08.pdf](http://www.esa.doc.gov/sites/default/files/innovation_measurement_01-08.pdf).

### 3. SOLUTIONS

Today we have no national measures to assess whether today's economy is more or less innovative (e.g. new products, services, production processes, and business models) than last year's economy. We have some sense that if the U.S. GDP grew by 2% in one year how much of this was due to labor force expansion and how much was due to increased productivity. However, this measure of productivity conflates two things: efficiency and innovation. An economy could grow simply by getting more efficient without producing anything new. The federal government does at some level know when new products come to market (e.g., a new drug, a cell phone) but it does not explicitly segregate new products' contribution to GDP nor does it try to measure the contribution to GDP of more incremental innovations (e.g., the improvements of the iPhone 6 compared to the iPhone 5).

The creation of a dollar-denominated measure of innovation that is incorporated via the NIPAs into the GDP measure would allow policymakers to assess the overall progress and rate of innovation in the U.S. economy. While BEA has made efforts to incorporate some "intangible" capital like R&D into the national output accounts and NSF has expanded its business R&D survey into an innovation survey, these are measures of capital and inputs, not measures of innovation output.

### 4. THE PATH FORWARD

NACIE recommends that ESA convene an initial half-day workshop of federal and external (i.e. nongovernmental) stakeholders to brainstorm strategies toward a dollar-denominated measure of innovation. Topics to consider may include but are not limited to

1. existing innovation measurement research;
2. candidate methodologies for incorporating an innovation measure into GDP; and
3. candidate plans for continued calculation and maintenance of any such measure, as well as a respective data collection plan, if necessary.

Based on the outputs of this workshop, NACIE recommends that ESA lead an interagency working group that is guided by the strategies developed during the initial workshop and that is narrowly focused on the creation of a dollar-denominated measure of innovation. The efforts to develop measures and indexes of innovation are varied and have spanned years.<sup>2</sup> Given that, NACIE expects that the working group would work actively to develop this measure for approximately five years and that it would continue beyond that timeframe in order to monitor the measure and methodologies.

While the data upon which the methodology is based ideally would consist of data that are already collected, the working group may also recommend the collection of additional data or modifications to current data collection methods. ESA is also encouraged to convene a Federal Advisory Committee in order to leverage the expertise of the private sector, academia, and other non-governmental entities.

### 5. OUTPUTS AND OUTCOMES

The direct output of this recommendation would be the convening of the aforementioned workgroup, along with the primarily desired output of the development of a dollar-denominated measure of innovation to be

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<sup>2</sup> See, e.g., Soumitra Dutta et al., *The Global Innovation Index 2014: The Human Factor in Innovation*, <https://www.globalinnovationindex.org/content.aspx?page=gii-full-report-2014>, James P. Andrew et al., *The Innovation Imperative in Manufacturing: How the United States Can Restore Its Edge* (Mar. 2009), <http://www.themanufacturinginstitute.org/-/media/6731673D21A64259B081AC8E083AE091.ashx>, The Bloomberg Innovation Index, <http://www.bloomberg.com/graphics/2015-innovative-countries/>, Jeffrey L. Furman et al., *The Determinants of National Innovative Capacity*, RESEARCH POLICY, Aug. 2002 at 899.

incorporated into the measure of GDP via the NIPAs and related data collection, calculation, and maintenance plans. The primary outcome would be more informed macro-level innovation-related policymaking in the U.S.