

**Empowering Students and Families to
Make Informed Decisions on Higher Education**

**Testimony Provided to the
Subcommittee on Higher Education and Workforce Training
Committee on Education and the Workforce
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Chairman Guthrie, Ranking Member Davis and Members for the Subcommittee, thank you for the opportunity to testify today.

My name is Mamie Voight and I am Vice President for Policy Research at the Institute for Higher Education Policy (IHEP), a nonprofit, nonpartisan research, policy, and advocacy organization working to promote college access, success, and affordability, particularly for students who have been underserved by our postsecondary system—including low-income students and students of color.

The research is abundantly clear: investing in a college education pays off.¹ But while college is often a worthwhile investment, students, policymakers, and institutions cannot answer crucial questions about which programs at which institutions provide an adequate return on this investment, and for which students.

At IHEP, we recognize that the use of high-quality data is necessary to drive improvements in student success and educational equity, which is why we lead the Postsecondary Data Collaborative (PostsecData). PostsecData brings together dozens of organizations committed to the use of high-quality data to improve student success and close equity gaps. Working with these partners, which represent students, institutions, and employers, we conduct research, identify potential policy solutions, and advocate for higher quality data, all in the interest of better serving students.

The Value of Information

Through our work with the PostsecData Collaborative we know this: our current postsecondary data infrastructure is a disjointed puzzle that needs to be improved. While our system is data rich, we are information poor. Institutions report data to multiple entities—states, accreditors, voluntary data initiatives, and various places within the federal government, including the Integrated Postsecondary Education Data System (IPEDS) and the National Student Loan Data System (NSLDS). In most cases, these various data systems do not talk with each other, and in some cases institutions are reporting very similar data to multiple places. In other instances, institutions must report data to the Department of Education that another federal agency already holds, such as data on the receipt of veteran’s education benefits.

As a result, the current system falls short of answering critical questions about college enrollment, completion, costs, and outcomes, and many existing data collections fail to capture the diversity of students pursuing college today. Students and taxpayers have a right to know what they can expect in return for investing their time and resources. Policymakers and institutions also deserve better information to guide equitable decisions about higher education policy and practice.

To illustrate the lack of data available today, consider this:

Ava is a working mother of two and is considering enrolling at a local college part-time to learn a new skill. Her resources are limited, and based on her annual income, she will qualify for some federal aid. As Ava considers the postsecondary options in her community, she seeks answers to the following questions about each college:

- How many part-time and low-income students graduate from colleges near me?
- How long does it take students to complete their degrees or certificates?

- What about the students who do not complete? Do they transfer and complete their studies elsewhere?
- How do students fare in the workforce after leaving college?
- How much do students borrow, and can they successfully repay their loans?

Like all prospective students, Ava should be able to answer each before deciding where she will enroll. But existing policies prevent us from answering these basic questions about college access, progression, completion, cost, and outcomes. Members of this very committee recognize the need to strengthen our data infrastructure. Chairwoman Foxx and Representative Sablan introduced a bill in 2015 titled Strengthening Transparency in Higher Education, which calls for key data elements to be displayed in a College Dashboard,² signaling the importance of data in student decision-making.

Answers to these questions also would prove immensely valuable to policymakers and institutional leaders. Each year we invest billions of taxpayer dollars in our nation's postsecondary education system. And targeted student aid helps millions of hard-working students make the promise of a college education an attainable reality. Yet policymakers lack valuable information about which institutions provide an adequate return on investment for which students, making it difficult to enact policies to drive institutional improvement. That needs to change.

Additionally, our nation's college leaders seek to provide educational offerings that meet the needs of their students and position them for success. But many lack comprehensive information about how their students fare after leaving their institution—either for subsequent education or for employment. A strong postsecondary data infrastructure will help college leaders develop and implement targeted strategies aimed at supporting student success.

Indeed, college leaders often cite data-use as a driving factor in helping them better serve students, and federal policy should be responsive to these institutional needs.³ But asking for additional metrics without evaluating the state of our current postsecondary data infrastructure would increase institutional burden associated with compliance reporting. A more efficient and streamlined reporting system will reduce the current data-reporting requirements as well as the financial and human resources necessary to complete current requirements. Alleviating this burden will allow institutions more time and resources to *use* the data to improve student outcomes.

The Problem: Our Current Postsecondary Data Infrastructure

The current puzzle that is our postsecondary data infrastructure is duplicative, inefficient, cumbersome, and worst of all—it does not allow key constituents to answer pressing questions about today's higher education system. Composed of the Integrated Postsecondary Education Data System (IPEDS), multiple data systems within the Office of Federal Student Aid, state longitudinal data systems, private data collections, workforce data held by multiple federal and state agencies, and more, the system is a maze of complexity, riddled with holes.

For instance, IPEDS serves as the primary public tool for collecting and reporting data on higher education. However, IPEDS is an aggregate data collection, meaning more than 7,000 institutions must use student-level data to calculate and report individual metrics. Making a change to IPEDS requires defining a new metric, providing detailed reporting instructions to institutions, and then each of those 7,000+ institutions

must calculate and report the new metric. As a result, changes are slow, and many students remain missing or invisible in IPEDS metrics. For example, the graduation rates in IPEDS only measure the percentage of first-time, full-time students who complete their degree or credential at their first institution within six years. It leaves out part-time students, transfer-in students, and does not count outward transfer as an outcome—a particular problem for community colleges. As a result, these graduation rates only reflect about half (47 percent) of today’s entering students.⁴

Student-level data reporting is less burdensome and more adaptable to a changing higher education landscape. The Office of Federal Student Aid at the Department of Education (ED) collects student-level data on students who receive Title IV financial aid, and ED has used those data to answer questions about student debt, loan repayment, and earnings.⁵ Because ED had student-level data, they were able to explore metric definitions and make informed decisions about data quality and appropriate specifications for public reporting. Also, those data were linked to earnings information held by the Department of Treasury (Treasury). This linkage is promising, yet incomplete because it leaves out non-aided students, an issue that is discussed in greater detail below.

The aggregate IPEDS reporting and the incomplete linkages between ED and Treasury offer just two examples of the cumbersome, inefficient, and incomplete data systems that compose our national postsecondary data infrastructure. So how can federal policymaking help fix these problems, answer key questions about higher education, and make the puzzle pieces fit? By identifying the data to collect and designing an infrastructure to collect them.

Metrics: What Data to Collect?

First, policymakers must determine what should be measured. Equitable access and success in higher education relies on information that reflects the higher education experience of all students at all institutions, yet many of today’s students are missing or invisible in current data systems. For example, data on graduation rates are limited to first-time, full-time students, data on employment outcomes are limited either to federal aid recipients or students who do not cross state boundaries, and cost and financial aid metrics are not always disaggregated by race/ethnicity or socioeconomic status.

Without better information, progress toward equity and success for all students is quite simply stagnated—prospective students and policymakers will continue to be forced to make key decisions without sufficient information. To advance the goals of social mobility and equity, we need a key set of comprehensive and comparable metrics that answer these critical questions about who attends college, who succeeds in and after college, and how college is financed. Specifically, the answers must provide information on how underserved students fare. Improved data that target student success will enable policymakers and institutions to help students—especially students of color, low-income students, and first-generation students—overcome barriers to college success, as well as empower the students themselves.

Over the past decade institutions and states have recognized the need for better data. As a result, many created and joined voluntary data initiatives to collect better information to inform institutional improvement, consumer information, and policymaking efforts. At IHEP, we reviewed the details of these initiatives and found a great deal of agreement about what is important to measure. In [Toward Convergence: A Technical Guide for the Metrics Framework](#), we categorize and define a set of about 30 metrics and 10 disaggregates that states and institutions find important in measuring college access, progression, completion, cost, and outcomes (see Table 1). These metrics measure performance, efficiency, and equity, and are designed to offer insights to institutions to help them improve. Some of

the metrics, such as enrollment or graduation rates, are collected already at the federal level in ways that fail to include all students. The proposed definitions underlying the Framework in Table 1 are intended to refine metrics to count all students, all institutions, and all outcomes. Given the field’s convergence on these metrics, they should be incorporated into government data systems, filling information gaps and answering unanswered questions about student success and equity.

Table 1: A Field-Driven Metrics Framework

| | ACCESS | PROGRESSION | COMPLETION | COST | POST-COLLEGE OUTCOMES |
|-------------|--|---|---|--|--|
| PERFORMANCE | Enrollment | Credit Accumulation Credit Completion Ratio Gateway Course Completion Program of Study Selection Retention Rate Persistence Rate | Transfer Rate Graduation Rate Success Rate Completers | Net Price Unmet Need Cumulative Debt | Employment Rate Median Earnings Loan Repayment and Default Rates Graduate Education Rate Learning Outcomes |
| EFFICIENCY | Expenditures per Student | Cost for Credits Not Completed Cost for Completing Gateway Courses Change in Revenue from Change in Retention | Time/Credits to Credential Cost of Excess Credits to Credential Completions per Student | Student Share of Cost Expenditures per Completion | Earnings Threshold |
| EQUITY | Enrollment by (at least) Preparation, Economic Status, Age, Race/Ethnicity | Progression Performance by (at least) Preparation, Economic Status, Age, Race/Ethnicity | Completion Performance by (at least) Preparation, Economic Status, Age, Race/Ethnicity | Net Price and Unmet Need by (at least) Economic Status, Preparation, Age, Race/Ethnicity Debt by (at least) Economic Status, Age, Race/Ethnicity, Completion Status | Outcomes Performance and Efficiency by (at least) Preparation, Economic Status, Age, Race/Ethnicity, Completion Status |

Key Student Characteristics

| | |
|---------------------------|-------------------------|
| Enrollment Status | Economic Status |
| Attendance Intensity | Race/Ethnicity |
| Credential-Seeking Status | Age |
| Program of Study | Gender |
| Academic Preparation | First-Generation Status |

Key Institutional Characteristics

| | |
|------------------------|---|
| Sector | Selectivity |
| Level | Diversity |
| Credential/Program Mix | Minority-serving Institution (MSI) Status |
| Size | Post-traditional Populations |
| Resources | Modality |

A Solution: Fixing Our Postsecondary Data Infrastructure

These voluntary initiatives have illuminated data gaps and proven that it is possible to collect better data. However, they do not serve as a replacement for data collection at the federal and state levels. By their nature, these initiatives are voluntary, so they do not include information on all institutions. When faced with life-altering, expensive college decisions, students should not have to rely upon voluntary reporting or explore more than a dozen initiatives to find the information they need. Furthermore, it is burdensome for institutions to participate in multiple voluntary initiatives. We must learn from these initiatives and use their experiences to implement a more permanent and effective policy solution.

As evidenced by the voluntary initiatives, the inability to answer critical questions and collect the metrics outlined above comes not from a lack of data, but rather from policy barriers that prevent existing postsecondary data systems from being linked. Integrating existing federal, state, and institutional data sources into a more coherent, nimble, secure, and privacy-protected network would create more usable information that could help students navigate the complex higher education marketplace. This type of network also is crucial to produce the information necessary to evaluate and meet workforce demands, to identify and close equity gaps in our postsecondary system, and to inform policy design.

Agreement has been growing around the best way to modernize our nation’s postsecondary data infrastructure. Through PostsecData, IHEP has engaged with organizations representing institutions,

states, students, and employers to explore options for improving our nation's postsecondary data infrastructure.⁶ This research has found that the best approach to producing the information necessary to answer students' questions is to develop a secure, privacy-protected postsecondary student data system.⁷ In fact, members of both the House and the Senate have introduced two bipartisan bills, the College Transparency Act and the Student Right to Know Before You Go Act, to create such a system.⁸ More than 70 organizations, representing students, institutions, veterans, college access providers, and employers, have publicly endorsed the College Transparency Act out of a recognition that this system would create a more functional postsecondary marketplace that serves all students. This type of system would:

- Empower all students to make more informed choices about where to spend their precious time and money,
- Only be used to help students,
- Protect student privacy and adhere to best practices in data security,
- Reduce reporting burden for colleges and universities by replacing the student components of the IPEDS,
- Better steward taxpayer dollars,
- Uncover equity gaps so colleges and universities can change policies and practices to better serve underrepresented students, and
- Align education with labor market demand and help employers identify programs that are effectively preparing students for the workforce.

Such a network would be limited in scope to answer only questions of national interest about college access, progression, completion, cost, and outcomes. Other systems, such as institutional data systems and state longitudinal data systems would still be necessary to answer more detailed questions.

Student protection must be at the heart of any data system. It must protect their privacy alongside their right to information, while securing their data using industry leading protocols, such as those developed by the National Institute for Standards and Technology (NIST) and by the International Organization for Standardization (IOS) and the International Electrotechnical Commission (IEC).⁹ Strong data governance structures should minimize the data collected, ensure all data are used in compliance with the law, provide notice to students of the collection, prohibit the sale of data or use of the system for law enforcement, issue penalties for misuse, conduct periodic audits, limit disclosures, especially of personally identifiable information, and craft provisions to handle a breach. Data should be used only to help, and never to harm students or limit opportunity, and this principle should serve as the foundation of all governance policy.

Why Should the Federal Government Act Now?

In 2014–15, the federal government disbursed more than \$162 billion in federal student aid,¹⁰ and needs better information to steward that taxpayer investment. Furthermore, at kitchen tables around the country, students like Ava are wrestling with life-changing postsecondary decisions, making choices with their families about where to go to college, what to study, and how to pay for it. Today they make those decisions in an unbalanced marketplace with limited access to information. For the marketplace to function effectively, all students need access to high-quality information to help them make

postsecondary decisions. The same information is needed to help state and federal policymakers and college and university educators implement policies and practices to help more students succeed, especially low-income students and students of color.

Federal Government's Unique Position

The federal government is uniquely positioned to compile that information—even if non-federal entities disseminate it. For example, consider how valuable the weather app on your phone is. I know I use mine daily to make decisions, such as what to wear and whether to walk to work or take the bus. These are much lower stakes decisions than where to go to college or what to study. Even privately developed weather apps are primarily made possible by data from the National Oceanic and Atmospheric Association's National Weather Service, housed at the U.S. Department of Commerce. The data are made available to non-governmental experts to translate into information for public use. Just as the federal government is uniquely positioned to compile weather data because it has access to satellites, for example, it also is the best option for compiling data on education and the workforce—given the information it already holds.

Federal Data on Workforce Outcomes

The Social Security Administration (SSA) and Internal Revenue Service (IRS) hold administrative data on employment outcomes for essentially all workers.¹¹ In fact, the federal government is the only entity with such comprehensive wage record data, making it the best source of workforce outcome information for colleges and universities.

Many states currently report workforce outcome data by linking education data to unemployment insurance (UI) records. However, these UI records—and the metrics they generate—are limited because they omit federal employees, military employees, the self-employed, and people who move across state lines.¹² Consider a state like Virginia, for example, where many residents work just across the state border in Maryland or Washington, D.C., and many residents work for the federal government. Federal sources fill these gaps by relying on tax records for people nationwide, regardless of where they study, live, or work.

To be sure, these workforce data are highly sensitive and must be closely secured. To provide the aggregate institution and program-level information that students, policymakers, and institutions need, the personally identifiable information (PII) on earnings should never be shared externally and never even needs to be shared with ED. ED would send student-level data organized in program and institution-level cohorts to the Department of Treasury to link with individual-level data on wages. Treasury would calculate the results for specific programs and institutions and share the *aggregate* information back with ED. The College Scorecard uses this information-exchange process to calculate employment outcomes for students who receive federal financial aid.

These data are illustrative of the value such information can provide, but the Scorecard's employment metrics should be improved in two ways. First, future efforts should report employment data at the program level, rather than only the institution level because employment outcomes vary by program even within institutions.¹³ Second, improved data metrics and data systems should include students who do not receive federal aid, as discussed below.

Counting All Students

Existing employment metrics only include students who received federal Title IV financial aid because ED only has data on these students in the National Student Loan Data System (NSLDS), and statutory barriers

prevent ED from collecting student-level data on non-Title IV students. However, data on aided and non-aided students are essential to answer critical questions about our higher education system for several reasons:

1. All students—regardless of whether they receive federal aid—deserve quality information on education and employment outcomes to help them make informed decisions. Only the federal government has access to complete earnings information, so institutions and states cannot answer questions about workforce outcomes as accurately as the federal government.
2. About 30 percent of students do not receive federal financial aid,¹⁴ and in some institutions and systems, even greater proportions of students do not receive federal aid. Consider the California Community College System, where only 22 percent of beginning students received Pell Grants and 3 percent received Stafford loans in 2013. Omitting non-federally-aided students leaves out at least three-quarters of students in this large system.¹⁵ If metrics are calculated on only a subset of students—those receiving Title IV aid—then the results will be skewed. Just as first-time, full-time graduation rates do not paint a complete picture of completion, neither do metrics limited to Title IV recipients. Both students and institutions deserve information that reflects the full student body.
3. Institutions as a whole, and all of their students, benefit from taxpayer investment through Title IV aid and federal higher education subsidies. As such, outcomes data should reflect the entire institution, not simply a fraction of its students.
4. Non-Title IV recipients also reap the benefits of federal investment in higher education. All tuition-paying students can claim education tax benefits, and in fact, the IRS already holds some data on essentially all students based on the 1098-T form,¹⁶ which is used to process education tax credits and deductions.¹⁷
5. Non-Title IV students must be included in a student-level data collection if it is to replace the student components of IPEDS and reduce burden on institutions. Many metrics in IPEDS, such as graduation rates and enrollment figures, include aided and non-aided students.
6. To promote equity and champion civil rights, data must allow policymakers and institutions to identify and close socioeconomic gaps in college access, success, and outcomes. To accomplish this, we need quality information on low-income students (i.e. Pell Grant recipients) and non-low-income students (i.e. students who do not receive federal aid), just as the Every Student Succeeds Act requires disaggregated data to be reported on the performance of economically disadvantaged students as compared to students who are not economically disadvantaged.¹⁸

Conclusion

Our country was built in part on the idea that, with hard work and a good education, any American can climb the ladder of social and economic mobility. And by 2020, there will be 55 million new job openings,¹⁹ providing the very economic opportunity that can help our cities and communities thrive. Nearly two-thirds of all jobs will require some postsecondary education and training.²⁰

Each day, millions of Americans are wisely investing in their futures by acquiring new knowledge and skills in college classrooms and are working hard to climb that ladder.

Members, you are entrusted to responsibly steward taxpayer dollars and make sound investments to help students access and succeed in our higher education system. As you undertake this responsibility, I ask you to consider the key questions you cannot currently answer.

A centralized data system would address the shortcomings of our current system by producing the information necessary to inform policy design.

And before Ava decides exactly where to invest her time and resources, she and millions of others just like her deserve answers to these same questions.

Thank you.

¹ Ma, J., Pender, M., & Welch, M. (2016). *Education Pays 2016*. The College Board. Retrieved from <https://trends.collegeboard.org/sites/default/files/education-pays-2016-full-report.pdf>

² Strengthening Transparency in Higher Education Act, H.R.3178, 114th Congress (2015). Retrieved from <https://www.congress.gov/bill/114th-congress/house-bill/3178>

³ Rorison, J. & Voight, M. (2016). *Leading with data: How senior institution and system leaders use postsecondary data to promote student success*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/ihep_leading_with_data_-_final.pdf; *Using data to increase student success (case studies)*. Association of Public & Land-grant Universities. Retrieved from <http://www.aplu.org/projects-and-initiatives/accountability-and-transparency/using-data-to-increase-student-success/index.html>

⁴ IHEP analysis of IPEDS 2015 data.

⁵ Executive Office of the President of the United States. (2015). *Using federal data to measure and improve the performance of U.S. institutions of higher education*. Retrieved from <https://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf>; Miller, B. (2016). *Building a student-level data system*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/building_a_student-level_data_system.pdf

⁶ Institute for Higher Education Policy. (2015). *Envisioning the National Postsecondary Data Infrastructure in the 21st Century (paper series)*. Retrieved from <http://www.ihep.org/postsecdata/mapping-data-landscape/national-postsecondary-data-infrastructure>

⁷ Rorison, J. & Voight, M. (2015). *Weighing the options for improving the national postsecondary data infrastructure*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/docs/pubs/weighing_the_options_for_improving_the_national_postsecondary_data_infrastructure_-_september_2015.pdf

⁸ Student Right to Know Before You Go Act, S.1195, 114th Congress (2015). Retrieved from <https://www.congress.gov/bill/114th-congress/senate-bill/1195>; Student Right to Know Before You Go Act, H.R.2518, 114th Congress (2015). Retrieved from <https://www.congress.gov/bill/114th-congress/house-bill/2518>; College Transparency Act, S.1121, 115th Congress (2017). Retrieved from <https://www.congress.gov/bill/115th-congress/senate-bill/1121>; College Transparency Act, H.R.2434, 115th Congress (2017). Retrieved from <https://www.congress.gov/bill/115th-congress/house-bill/2434>

⁹ Grama, J.L. (2016). *Understanding information security and privacy in postsecondary education data systems*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/information_security_and_privacy.pdf

¹⁰ Baum, S., Ma, J., Pender, M., & Welch, M. (2016). *Trends in Student Aid 2016*. The College Board. Retrieved from https://trends.collegeboard.org/sites/default/files/2016-trends-student-aid_0.pdf

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- ¹¹ Zinn, R. (2016). *Classroom to career: Leveraging employment data to measure labor market outcomes*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/leveraging_employment_data_0.pdf
- ¹² Zinn, R. (2016). *Classroom to career: Leveraging employment data to measure labor market outcomes*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/leveraging_employment_data_0.pdf
- ¹³ Schneider, M. (2014). *Measuring the economic success of college graduates: Lessons from the field*. American Institutes for Research. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/leveraging_employment_data_0.pdf http://www.air.org/sites/default/files/downloads/report/Measuring%20the%20Economic%20Success%20of%20College%20Graduates_Mark%20Schneider.pdf; Carnevale, A.P., Cheah, B., & Hanson, A.R. (2015). *The economic value of college majors*. Georgetown University Center on Education and the Workforce. Retrieved from <https://cew.georgetown.edu/wp-content/uploads/The-Economic-Value-of-College-Majors-Full-Report-Web.compressed.pdf>
- ¹⁴ Executive Office of the President of the United States. (2015). *Using federal data to measure and improve the performance of U.S. institutions of higher education*. Retrieved from <https://collegescorecard.ed.gov/assets/UsingFederalDataToMeasureAndImprovePerformance.pdf>
- ¹⁵ Laitinen, A. (2015, September 18). Why the U.S. needs better student data. *The Chronicle of Higher Education*. Retrieved from <http://www.chronicle.com/article/Why-the-US-Needs-Better/233253/>
- ¹⁶ Bergeron, D.A. (2016). *Leveraging what we already know: Linking federal data systems*. Institute for Higher Education Policy. Retrieved from http://www.ihep.org/sites/default/files/uploads/postsecdata/docs/resources/linking_federal_data_systems.pdf
- ¹⁷ Internal Revenue Service. (2016, September 23). Form 1098-T, Tuition Statement. Retrieved from <https://www.irs.gov/uac/form-1098-t-tuition-statement>
- ¹⁸ Sec. 1111(h)(1)(C)(ii), Every Student Succeeds Act, Public Law 114-95, 114th Congress (2015). Retrieved from <https://congress.gov/114/plaws/publ95/PLAW-114publ95.pdf>
- ¹⁹ Carnevale, A.P., Smith, N., & Strohl, J. (2013). *Recovery: Job growth and education requirements through 2020*. Georgetown University Center on Education and the Workforce. Retrieved from https://cew.georgetown.edu/wp-content/uploads/2014/11/Recovery2020.FR_Web.pdf
- ²⁰ Carnevale, A.P., Smith, N., & Strohl, J. (2013). *Recovery: Job growth and education requirements through 2020*. Georgetown University Center on Education and the Workforce. Retrieved from https://cew.georgetown.edu/wp-content/uploads/2014/11/Recovery2020.FR_Web.pdf