

The Contribution of Minority Business Enterprises to the U.S. Economy

U.S. Department of Commerce, Minority Business Development Agency

by

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Acknowledgments

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Foreword

“These findings point to the urgency of increasing MBE performance by encouraging their expansion in growth sectors, facilitating the adoption of new technologies, and expanding access to capital, for the benefit of local communities and the national economy”

The landscape of minority economic opportunity is rugged, but it is more important than ever to local communities and to the national economy. This new MBDA report, *The Contribution of Minority Business Enterprises to the U.S. Economy*, makes a clear and compelling case their success is essential for continued economic growth.

The importance of minority business enterprises (MBEs) is seen with simple arithmetic: by 2044, minorities will be a majority of the U.S. population. By implication, minority workers and MBEs represent a significant and growing share of the economy.

The analysis shows MBE contributions to the economy will increase in both absolute and relative terms over time. A projection of the contribution of MBEs and minority workers from 2020 to 2060 shows that the productivity of MBEs and minority workers is lagging. This lag will lead to less than optimal outcomes for MBEs and create a drag on growth.

The findings point to the urgency of increasing MBE performance by encouraging their expansion in growth sectors, facilitating the adoption of new technologies, and expanding access to capital, for the benefit of local communities and the national economy.

This report is intended to be used by federal policymakers, Congress, academia, and other thought leaders to support evidence-based discussions regarding the current and future economic contributions of MBEs. Together, we can change the productivity equation of MBEs.

**Office of Policy Analysis and Development
Minority Business Development Agency
U.S. Department of Commerce**



Key Sections



Building the Baseline

Minority business enterprises, population, and employment are all growing faster than their non-minority counterparts.



Capabilities and limitations of the Inclusive Growth Model

The Inclusive Growth Model uses an economy-wide labor-market oriented approach to project demographic change, employment, labor participation, and GDP contributions of MBEs from 2020 to 2060.



Baseline Results: Minority Business Enterprises by 2060

While MBEs will increase their share of GDP contributions over the next forty years, MBEs need an infusion of productivity to catch up to non-MBEs faster, and reach parity.

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Executive Summary

Minority firms and workers are a growing share of U.S. businesses and the workforce. As a result, the strength of the broader U.S. economy is increasingly tied to minority-owned business enterprise (MBEs) performance. In 2017, it was estimated that there were approximately 9.2 million employer and non-employer (classifiable) MBEs combined, generating \$1.7 trillion in revenue and with employer MBEs providing more than 8.9 million jobs. This report examines and develops a new baseline estimate for the productivity of employer MBEs and estimates of Gross Domestic Product (GDP) of employer classifiable firms (i.e., minority and non-minority) using the latest data available.

In 2017, there was an estimated 1.015 million MBEs with employees ('employer MBEs') and these firms generated \$1.401 trillion in revenues and employed 8.923 million people.² Classifiable MBEs value-added contributed 2.3 percent of GDP, or approximately \$500 billion, compared to 15.5 percent for non-minority employer firms. By the mid-2040s, the minority population will constitute a majority of the U.S. population and workforce, and while minority firms will continue to grow as a share of total private sector enterprises, the contribution of minority classifiable employer businesses to GDP will be only 5.5 percent if current trends continue. There is evidence that MBEs exhibit productivity levels lower than the national average for all classifiable firms, and that the rate of catch-up is insufficient to reach the rate of non-minority firms by the time population shares reverse. As a policy matter, there are concerning implications for future U.S. economic growth if a growing share of the business sector exhibits productivity levels lower than the national average. If further research supports these findings, there is a case for policy efforts to turn to solutions for increasing productivity growth in MBEs generally, and to support the participation of MBEs in higher productivity growth sectors.

"Productivity," simply defined, is a measure of the relationship between a firm's inputs and output. If a firm can produce more value-added from a given set of inputs, then its productivity has increased.

This report looks at the current and potential future contributions of employer MBEs and the key underlying drivers in their contribution

to the U.S. macroeconomy. By estimating simple linear trends in the historical and current contributions of employer MBEs to the U.S. economy and projecting these trends forward, a baseline is established for the path of MBE economic growth. At this point in time, data on MBEs is sparse and is reported over inconsistently spaced years, complicating estimation of comparative productivity trends. Simple linear trends of existing data indicate increasing productivity in MBEs, but at a rate lower than that required to manifest as a positive contribution average economic growth. That is, as the number of employer MBEs grows as a share of total enterprises but with lower productivity, this could result in an estimated \$5.3 trillion (in 2012 dollars) opportunity gap per year by 2060 because of the lower levels of productivity.³

A productivity gap between MBEs and non-MBEs has ramifications for the income levels, and income growth, of minority workers and business owners and for economic opportunity in minority communities. If linear projections of current and historical trends are indicative, the MBE average productivity will not catch non-MBE average productivity before 2060.

MBE productivity trends are part of the research agenda to better understand the role that MBEs play in the U.S. economy. As a first step in a longer term research agenda, a modeling tool was developed, herein referred to as the Inclusive Growth Model (IGM), that applies an economy-wide labor-market oriented approach to project demographic change, employment, labor force participation, and GDP contributions from 2020 to 2060. The IGM is a tool designed to undertake simple linear extrapolations of available data on MBE performance and composition. Early results suggest that while the share of the minority population will surpass that of the non-minority population in 2044, the average productivity of MBEs and minority workers will remain lower than the average of the U.S. economy at that time. As a simple matter of arithmetic, unless non-MBE and non-minority worker productivity accelerates at an increasing rate to offset this trend, average U.S. multi-factor productivity and, therefore, economic growth, could be increasingly constrained, and the opportunity

gap between minority and non-minority populations could increase.

The trends in productivity growth are a symptom of an underlying set of causes. Understanding those causes, both in terms of what they are and how they can be addressed, will be an important policy area for minority business development and the ongoing growth, resilience, and adaptability of the U.S. economy. It is likely that a significant underlying cause is sectoral composition – that is, the extent to which employer MBEs and minority workers are participating in higher productivity sectors, occupations, and tasks at the rates that are needed to reach parity in economic performance, and, more specifically, contributions to GDP. Simple linear projections of currently available data using the IGM suggest that parity in economic opportunity can only be achieved by (i) expanding the number of employer MBEs toward non-MBE levels (as a share of the respective populations), and (ii) supporting greater MBE productivity and performance overall, such as through supporting increased MBE participation in high-productivity, high-growth sectors of the economy.

The findings in this report point to the urgency of increasing productivity of employer MBEs and the minority workforce.

Finally, the baseline reported here can be updated annually to form a focal point for research efforts and to track progress over time, and the modeling tool can be used to consider potential economic effects of changes in the economy such as emerging technologies.

This report is intended to be used by MBDA and other federal policymakers, Congress, academia, and other thought leaders to support evidence-based discussions regarding the current and future contributions of employer MBEs to the U.S. economy.



KEY FINDINGS

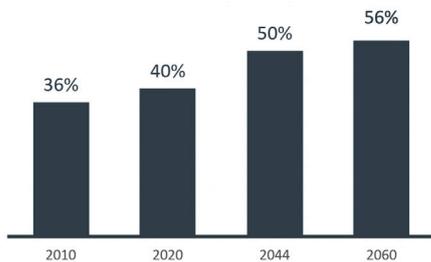
In 2017, there was an estimated 1.015 million MBEs with employees and these firms generated \$1.4 trillion in revenues and employed 8.9 million people.

MBEs with employees		1.015 million
Revenue		\$1.4 trillion
Employed		8.9 million

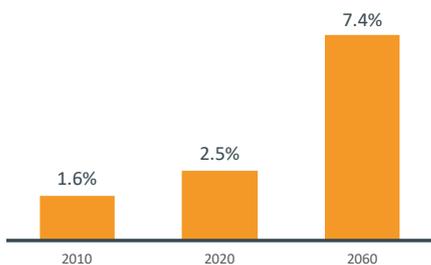
Value-added (2012) of Classifiable MBEs

2.8
Percent of GDP

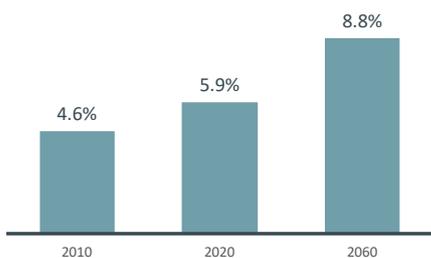
\$449.3
Billion



The minority share of the population was 36 percent in 2010, 40 percent in 2020, and is projected to reach 50 and 56 percent in 2044 and 2060, respectively.



The GDP contribution of minority classifiable businesses was 1.6 percent in 2010, 2.5 percent in 2020, and is projected to reach 7.4 percent in 2060.



The share of the workforce employed by MBEs was 4.6 percent in 2010, 5.9 percent in 2020, and is projected to reach 8.8 percent in 2060.

“These findings point to the urgency of increasing the productivity of MBEs and the minority workforce”

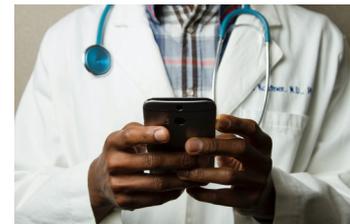
The top six industries for share of MBEs with paid employees are:



Accommodation &
Food Services



Retail Trade



Health Care &
Social Assistance



Professional Scientific &
Technical Services



Other Services



Construction

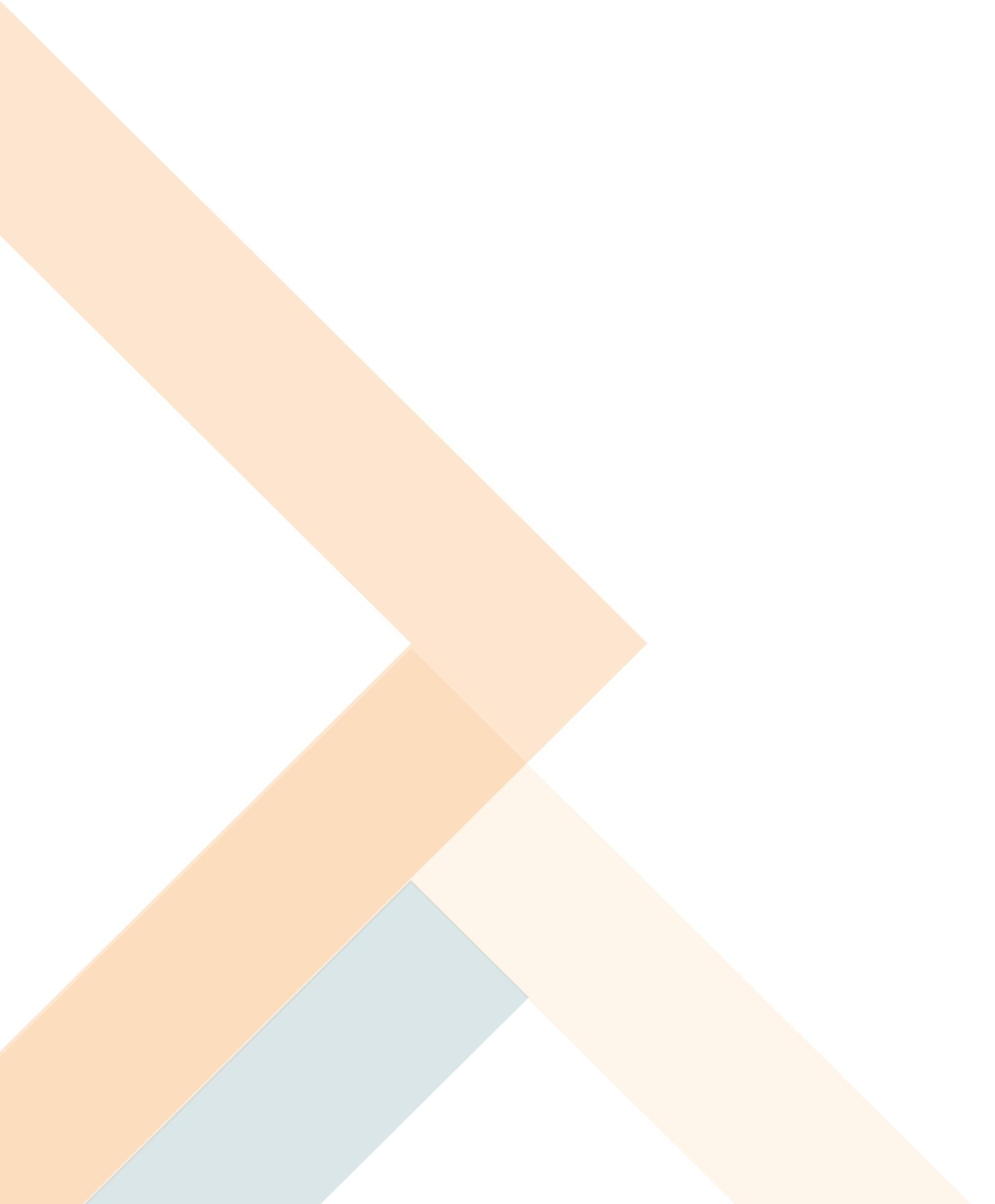
Employer MBEs and minority workers are moving towards sectors and occupations characterized by higher productivity, which will help increase the productivity of minority workers and businesses over time.

The Inclusive Growth Model projects that, although the population of minorities will exceed that of non-minorities by 2044, the GDP contributions of employer minorities will not catch up to that of non-minorities until 2059.

\$5.3 trillion

(in 2012 dollars)

The opportunity cost to the economy due to the opportunity gap between MBEs and non-MBEs.



Introduction

This report examines the contribution of employer minority business enterprises⁴ (MBEs) to the U.S. economy and represents an evolutionary step forward from MBDA's flagship report *The State of Minority Business Enterprises*. The empirical work in this report contributes to that agenda. This report focuses on enhancing the understanding of the increasing importance of MBE performance for the U.S. economy that inevitably flows from the historic shift in demographics that is currently underway.

The set of factors that determine minority economic opportunity and its implications for the economic performance of the United States as a whole is large and complex, but a clear and compelling case for the central and increasing importance of the employer MBE experience to the future of U.S. economic growth lies in simple arithmetic: the minority population is a large and growing part of the total U.S. population, yet evidence suggests that minority-owned business' average productivity is lower than that of the national average for all businesses. Further, the current rate of catch-up – at least as implied by a linear extrapolation of current trends – is insufficient to close the gap before the minority population becomes the majority. Whether due to differences in rates of capital formation, human capital acquisition, or other factors, this lower productivity has negative implications for U.S. economic growth over time.

This report draws on official U.S. data sources. The empirical results are based on an analysis of employer MBE performance in the context of the broader U.S. economy. The demographic linear trend-based model used in this report was developed by linking data from the Census Survey of Business Owners, the Census Annual Survey of Entrepreneurs, Bureau of Economic Analysis U.S. input-output tables, supply-use matrices, and the U.S. industry and macroeconomic accounts. The baseline data and the modeling tool leverage existing public data to offer an illustrative view of employer minority and non-minority business, worker productivity, and economic activities using industry and macroeconomic data in combination.

This purpose of this report is to provide direction for future studies in OPAD on the contributions of classifiable employer MBEs to the U.S. economy. Classifiable firms are defined as privately held, for-profit, U.S. domestic enterprises with ownership distinguishable by race, ethnicity, gender, and veteran status. To be classifiable, firm ownership must be distinguishable by these demographic factors: this rules-out, for example, widely held enterprises listed on the Dow Jones or NADAQ indexes. Classifiable firms represent a small share of total U.S. enterprises in terms of gross receipts and value-added (about 18.5 percent of value-added), but they are important to the dynamic evolution of the U.S. economy. Small and medium sized businesses important contributors to employment, economic activity, and supply chains in urban and rural areas. So, a healthy small business environment is conducive to a dynamic economy that generates

“A clear and compelling case for the central importance of the MBE experience to the future of U.S. economic growth lies in simple arithmetic: minorities are a large and growing part of the U.S. population, yet minority productivity lags behind that of non-minorities”

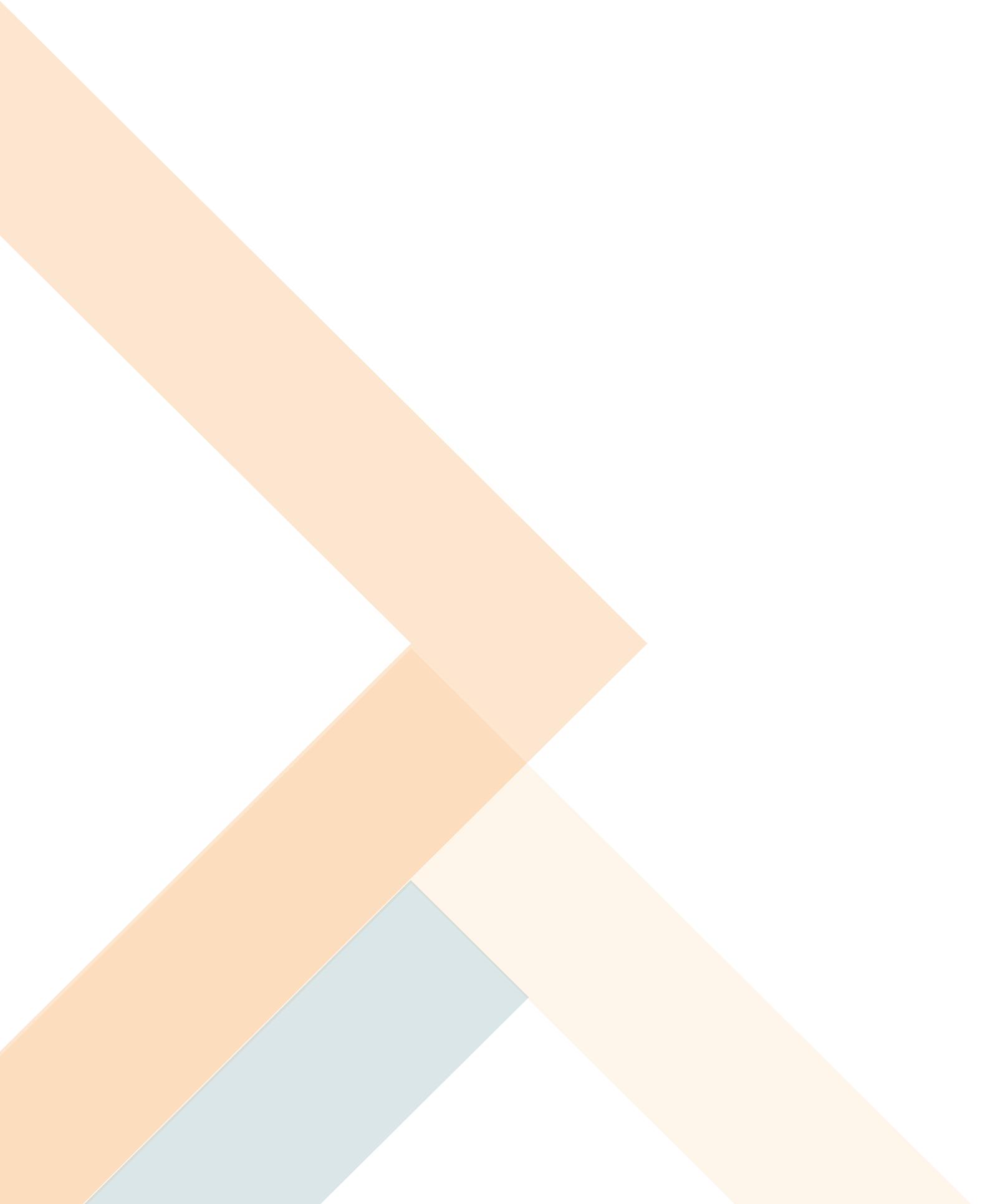
entrepreneurial opportunity, and that facilitates the conversion of ideas and risk-taking into growing incomes for all U.S. citizens. The ability of minority entrepreneurs to build capital and support employment in their communities is an important part of the solution to closing the wealth gap between minority and non-minority communities.

For the sake of comparability, the data used is on classifiable and private employer minority and non-minority businesses, which are mainly small- and medium-sized firms. This approach limits faulty comparisons, e.g., between a large corporate grocery store chain and a small family-owned food mart. Comparing available data on MBEs to the national input-output accounts data allows for estimates of value-added for different categories of classifiable firms by sector.

Because the data are sparse and available for only select years, the macroeconomic context of the available data is important for understanding how the contributions of minority-owned firms to the overall economy change over time. The analysis presented below represents a first attempt to provide baseline projections based on SBO payroll data and BEA compensation of employee data.

A key force driving the baseline trends is that the employer MBE value-added share in GDP has not kept pace with the growth in the number of employer MBE firms. This appears to be due to lower levels of productivity in MBEs and the minority workforce, as well as a smaller average size of MBEs. The contribution of employer MBEs to GDP in the future is projected to eventually catch up to that of non-minorities based on simple linear extrapolation of current trends, but not until 15 years after minority groups become the majority of the population. Current and historical trends for employer MBEs and minority workers suggest that they may maintain lower levels of productivity than their non-minority counterparts, to at least 2060.





The Inclusive Growth Model

Building the Baseline

The minority population, level of employment, and number of business enterprises (employer and non-employer) are all growing faster than their non-minority counterparts. A modeling tool herein referred to as the Inclusive Growth Model (IGM) uses available industry and macroeconomic data to estimate and generate linear projections of the contribution of MBEs to GDP based on current trends. The IGM provides a means to create counter-factual scenarios for looking at the implications of potential changes in productivity levels, labor productivity growth

rates, and other factors that can influence the contribution of MBEs to GDP.

Currently, as a key finding in the “baseline” data, the value of sales per employee for employer MBEs are currently 80 percent of their non-MBE counterparts. This is not the only or definitive metric for productivity – there is no single definitive definition and researchers commonly consider a basket of different metrics to gain a broader understanding – but the result provides an indication of potentially lower value-added in MBE firms. Value-added represents income

Table 1: Select sectors for employer MBE sales concentration, 2012 and 2017 (%)

Sectors Ranked by 2017 Values	2012	2017
Wholesale Trade	24.79	22.23
Retail Trade	22.11	20.30
Accommodation and Food Services	9.45	11.57
Professional, Scientific, and Technical Services	8.56	9.27
Health Care and Social Assistance	8.50	8.97
Construction	5.80	7.52
Manufacturing	6.66	5.40
Administrative and Support and Waste Management	3.76	3.39
Transportation and Warehousing	2.68	3.13
Other Services	2.19	2.45
Finance and Insurance	1.35	1.77
Real Estate	1.32	1.58
Information	1.34	1.20
Educational Services	0.44	0.47
Arts, Entertainment, and Recreation	0.53	0.47
Agriculture, Forestry, and Fishing	0.11	0.15
Mining and Quarrying	0.30	0.11
Utilities	0.10	0.02
Total Sales	100	100

Source: Census Bureau, authors' calculations

to workers and owners of fixed capital, and so lower value-added, implied by a lower average value of sales per worker, leads to implied lower incomes for workers and business owners.

As a result of lower levels of average labor productivity, even though minority workers and employer MBEs are growing as a share of the population, business sector, and workforce, their contribution to GDP growth remains comparatively low relative to non-minority employers and workers. At rates of change implied by current trends, the contribution of MBEs and minority workers to GDP will not catch up to that of non-minorities until 15 years after minorities become a majority of the population. Based on the linear projections reported here, that means not until 2060.

Worker Occupation and MBE Sales

In 2012, there were 7.95 million employer and non-employer MBEs in the United States, comprising 29.3 percent of all classifiable firms. These MBEs generated \$1.38 trillion in annual gross receipts. Minority business enterprises

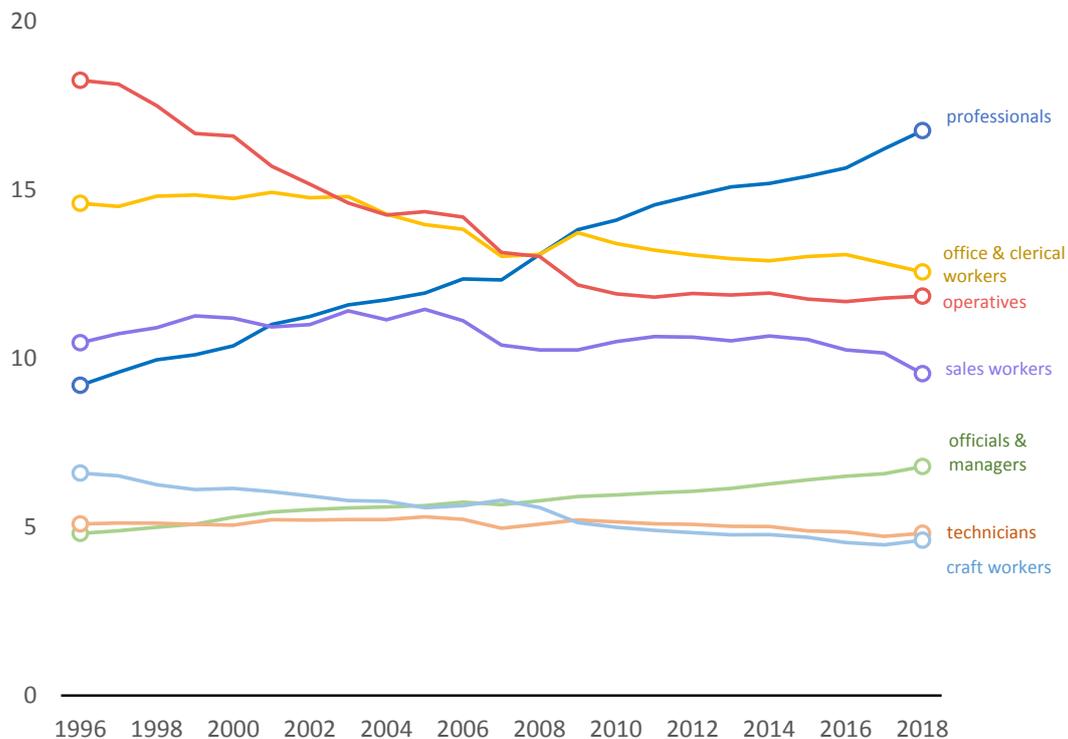
can be found in all 50 states and the District of Columbia.

Both employer MBEs and the minority workforce (from which MBE ownership is drawn) are growing in absolute and relative terms. Changes in the sectoral composition of employer MBEs are similar to the changes in the occupational composition of the minority workforce, and both are informative of important trends.

For instance, changes in the minority workforce include a movement away from Office and Clerical Workers and Operatives (e.g., machine and transportation operators) toward the higher-skilled and higher productivity group of professional and technical services workers.

The type of employer enterprise has also shifted. Table 1 lists the distribution of employer MBE sales across sectors in 2012 and 2017. The concentration of employer MBE sales has increased in relative terms in sectors like Professional, Scientific, and Technical Services and decreased in Manufacturing. Other data⁵ show that minority enterprises disproportionately employ minority workers, and so it is likely that the changes in minority labor occupation

Figure 1. Minority workforce private sector employment, by selected occupations, 1996-2018 (%)



Source: Census, BLS, authors' calculations

Table 2: Minority Workforce by Occupation, 2012-2018 (%)

Occupations Ranked by 2018 Values	2012	2013	2014	2015	2016	2017	2018
Service Workers	22.30	22.37	21.95	21.87	21.96	21.06	21.35
Professionals	14.82	15.08	15.19	15.4	15.65	16.22	16.75
Office and Clerical Workers	13.03	12.96	12.9	13.02	13.07	12.82	12.56
Operatives	11.92	11.88	11.94	11.76	11.68	11.78	11.84
Laborers	11.30	11.27	11.31	11.43	11.49	12.20	11.74
Sales Workers	10.63	10.52	10.66	10.56	10.25	10.16	9.54
Officials and Managers	6.06	6.14	6.27	6.4	6.5	6.85	6.79
Technicians	5.07	5.02	5.01	4.88	4.85	4.72	4.81
Craft Workers	4.83	4.77	4.77	4.69	4.54	4.47	4.60
Total Employment	100	100	100	100	100	100	100

Source: Census, BLS, authors' calculations

are at least in part reflective of the change in the sectoral distribution of minority enterprises. This highlights the important links between minority enterprise and minority employment opportunities.

The distribution of the minority workforce private sector employment, by occupation, has changed over time as shown in Figure 1 with the underlying data reported in Table 2. Over 1996 to 2018, the share of the minority workforce in the professional services occupations has increased over time, while the shares in clerical occupations and machine operators decreased. Minority worker participation in clerical and operatives (machine operators) also decreased. Over this same period, minority worker participation in professional services increased.

Population and Employment

Minorities are a growing share of population and employment. In 2010, minorities represented 36.2 percent of the population: between 2010 and 2019 the average annual growth rate of the minority population was 1.9 percent compared with 0 percent for the non-minority population, leading to minorities accounting for 40.0 percent of the population in 2019. Similarly, in terms of employment, in 2010 minorities represented 31.3 percent of the workforce: over the period 2010 to 2019, the average annual growth rate of the minority share of the workforce was 3.4 percent compared to 0.4 percent for non-minorities. Minorities also exhibited a higher average

annual growth rate of total hours worked over this period: 3.6 percent compared to 0.5 percent for non-minorities.

Similar comparisons can also be seen for employer minority business owners relative to employer non-minority business owners:

- The share of the workforce employed by classifiable MBEs was 5.8 percent in 2019, compared to 32.2 percent for non-MBEs.
- Employer MBEs represented 2.5 percent of total wages and salaries paid in 2010 and 3.3 percent in 2018. Employer non-MBEs represented 24.2 percent and 22.4 percent, respectively.
- Value-added to GDP contributions of employer MBEs was 2.3 percent in 2018, and 15.5 percent for non-MBEs.

In 2010, the contribution of employment to total value-added (i.e., GDP) calculated as hours worked multiplied by the value-added of each hour worked, (i.e., the hourly wage) was 26 percent for minority workers and 74 percent for non-minority workers (a gap of 48 percentage points). In 2018, those figures were 31 percent and 69 percent, respectively (a gap of 38 percentage points).

As noted above, minority populations have been catching up to non-minorities in population and employment shares over the most recent decade. The IGM was built around population projections and demographic

dynamics to consider the implication of these changes. This approach enables a focus on minority GDP contribution with a distinction between minority GDP contributions due to population growth and those due to labor productivity (real wages).

From the MBE Data to the National Accounts

This section explains the calculation of GDP contributions and its connections to the SBO, and later sections explain the IGM projections of productivity and employment.

A shift in a nation's demographics is likely to result in adjustment to a nation's economic structure. Projections of Census data suggest that minorities will comprise the majority of the U.S. population around 2044 or 2045. The demographic shifts are seen in the age distribution of the U.S. population with the minority-majority shift having already occurred in the under-15 population.⁶

In this context, it is helpful to understand underlying factors that drive or constrain MBE performance.

Understanding MBE performance begins with analyzing demographic and economic data. By international standards, U.S. official economic data is comprehensive and of high quality. For a subset of U.S. enterprises, including MBEs, there is a limited set of data sources that report information that distinguishes demographic characteristics for the U.S. population linked to business and economic data.

Data that includes demographic characteristics necessarily reports on a subset of firms for which ownership and control can be linked to identifiable individuals. These firms are known as "classifiable" firms. This report adheres to the definition of this class of firms used in the U.S. Census Bureau's Survey of Business Owners and Self-Employed Persons (SBO): classifiable firms are for-profit, U.S. domestic enterprises with ownership distinguishable by race, ethnicity, gender, and veteran status. Firms that are not classifiable include public administration, publicly held, not-for-profit, or foreign-owned firms. Classifiable firms represent a key source of growth in domestic economic activity: in the 2012 SBO, they accounted for 98 percent of all surveyed U.S. firms (95 percent of employer firms),

36 percent of total sales, 49 percent of employment, and 40 percent of total payroll.

Another definition applied throughout this report is the distinction between employer and non-employer firms. The U.S. Small Business Administration (SBA) notes that "[t]he step from non-employer to employer entails registration and legal requirements, workers' compensation, unemployment insurance, and the ongoing burden of making payroll".⁷ The SBA motivation for this distinction in firm type and structure, from both the cost and organizational perspectives, is meaningful for understanding how businesses develop. According to the most recent SBO data (2012), firms with paid employees represented 19.6 percent of all firms and 96.9 percent of total gross receipts of all businesses in the United States. These data show that employer firms are fewer in number but bigger in size measured by gross receipts, payroll and employment, and they comprise most economic activity. In 2012, minority firms without paid employees (non-employer MBEs) comprised 32.0 percent of all classifiable non-employer firms, while minority firms with paid employees (employer MBEs) accounted for 17.7 percent of all classifiable employer firms. Research suggests that the higher relative share of minority ownership in non-employer firms is a result of a range of factors but includes the availability of alternative employment opportunities (particularly in economic downturns, discussed briefly below).⁸

The SBO and ASE databases report that, on average, MBEs have lower levels of gross receipts, payroll, and employment levels compared to non-MBEs. There is also evidence running through the limited time-series of SBO data that a degree of catch-up by MBEs on these metrics had occurred from 2002 through 2012, and the ASE shows it continues through various reported years after. A potential implication of these MBE performance relativities when combined with the unfolding population dynamics is slowing U.S. economic growth, implied by the arithmetic of a growing share of the population exhibiting lower business performance and labor productivity outcomes. This report addresses the issue from the perspective of productivity.

The analytical framework used in this report relies on the available data on MBEs and relevant macroeconomic accounting concepts, which are discussed below.

Alignment in the Data

The SBO, ASE and other quasi-demographic business and economic datasets are not primarily focused on traditional economic data. These releases typically report business performance metrics like gross receipts, payroll, and employee numbers, and they are survey-based datasets. These are not ideal indicators from which to extrapolate the MBE relationship with the broader economy, or for determining their contribution to key macroeconomic aggregates like gross domestic product (GDP) and gross national income (GNI). Linking these business-focused datasets to U.S. economic data is needed to examine the contribution of MBEs to GDP.

There is no singularly perfect macroeconomic performance indicator. The two mentioned above are part of a larger range of metrics that economists track, and all are important in the context of their intended area of focus. U.S. gross domestic product is a measure of economic activity occurring within the borders of the United States, regardless of the nationality of the worker, entrepreneur, or firm. Gross national income is a measure of the economic activity of U.S. nationals regardless of where in the world the activity took place and is defined by adjusting GDP for net cross-border flows of capital and labor income. This report will focus on MBE links to GDP, but the intention of the research program at MBDA is to expand and broaden the macroeconomic analysis of MBEs.

GDP has several definitions that measure it from alternative perspectives. It can be calculated by summing expenditures by end-users of products produced in the domestic economy (the “expenditure-side” definition of GDP) or by summing income paid to labor and fixed factors (capital, land, and natural resource rents) employed in production of these goods and services along with the indirect taxes levied on their sale (the “income-side” definition of GDP). Both definitions are useful in different contexts: they add-up to the same number, measuring the same activity from different perspectives.⁹

GDP measured from the income side defines national aggregate “value-added”. Value-added is just a term used to describe economic activity and is so named to capture the distinction between the inputs a firm purchases and the “value it adds” on top by applying its primary factors in production. Income-side

GDP is a better candidate for forming links to data on MBEs found in datasets like the SBO and ASE that report some elements of value-added and other production costs and is related more directly to the economy’s industry activity.

Gross domestic product (income)

$$\begin{aligned} &= \text{Compensation of Employees} + \text{Indirect taxes} \\ &\quad + \text{Gross operating surplus} \\ &= \text{Total domestic value-added} \end{aligned}$$

The logic underneath the definition begins with the revenue enterprises generate in sales of their output. That revenue is used to pay for the costs of production and to provide a return on the capital and other fixed factors committed by the owners. Some of those costs involve payments for “intermediate” inputs, goods and services produced by other firms - like, say, tires used in manufacturing motor vehicles - that represent the activities of other firms in earlier stages of the supply chain. Importantly, they are not part of the user firm’s value-added, instead embodying the value-added of earlier-stage firms.

Some of the revenue pays for labor costs. “Compensation of employees” (COE) is a statistical definition for employee income used in the U.S. macroeconomic accounts, defined as the total outlay by employers on wage and salary compensation, payroll/social security taxes, and various labor-related on-costs like medical benefits. COE could very well be an acronym for “cost of employment” without introducing inaccuracy. As COE is calculated from the employer’s perspective, it subsumes the various income taxes (known as “direct taxes” by economists) paid by employees on the salary or wage component of labor income, and so these are not explicitly reported.

The definition of “revenue” being applied here uses “producer prices” that include indirect taxes, mostly comprised of sales taxes but potentially also including production taxes/subsidies. Sales taxes are collected on behalf of local, state and federal authorities by firms on their sales, so some of this sales revenue is remitted to governments. The sale price inclusive of the tax represents the value of the firm’s activities to final users, just like any other underlying cost. As such, sales tax revenues can be thought of as the cost of government services implicit in the firm’s costs, implicit in, for example, roads, utilities, and other infrastructure, or the enforcement of property rights and contract law, that add indirect value to a firm’s activities. Direct taxes like income

taxes are already captured in COE and GOS, but indirect taxes must be added back in separately.

The third component, gross operating surplus (GOS) is the residual from total sales revenue after all other costs are paid, i.e., the revenue left over after the cost of labor, intermediate inputs, and indirect taxes. In this way, GOS literally defines an “operating surplus” of revenue after all other costs, and so provides the basis for the “profit” that accrues to the owners of the firm. It is notionally comprised of a gross profit on capital and other fixed factors (for example, economic rents paid to land and natural resource deposits) but can include other definitional items like payments to owner labor not remitted as salaries (known as “imputed wages”). GOS is defined in “gross” rather than “net” terms because it is measured before depreciation on capital is counted (depreciation is the raw “cost of capital” in production). GOS is comparable to perhaps more familiar accounting concepts for gross profit or “gross margin” like EBITDA (earnings before interest, taxes, depreciation, and amortization). The net accounting profit the firm ultimately reports is then drawn from GOS after various taxes, tax allowances, interest costs and other deductions are subtracted.

Gross operating surplus

$$\begin{aligned} &= \text{Total sales/Total costs} - \text{Intermediate Inputs} \\ &- \text{Compensation of Employees} - \text{Indirect taxes} \\ &= \text{Gross profit to the firm's owners} \end{aligned}$$

SBO and ASE data for gross receipts is equivalent to the revenue concept threaded though the discussion above. The SBO and ASE also report one component of value-added – payroll – but with a slightly different definition to the national industry accounts COE metric. These sources do not report GOS or indirect taxes: of course, total value-added and its components are embedded in the gross-receipts data (because it includes all production costs), but so too are intermediate costs. As a result, a few pieces of information required to extract the components of the firm’s value added necessary to link the firm’s activities to GDP are not explicit.¹⁰ If the goal is to understand MBE contributions to macroeconomic aggregates defined by value-added concepts, like GDP, and to distinguish their differences to non-minority firms, the problem is significant. The MBE-reporting data sources also lack detail on BE intermediate inputs and sales destination,

limiting the scope for placing MBEs in the supply chain.

The limitations are largely due to a misalignment between the MBE reporting data sources and national accounts data. In the 2019 BEA input-output data for the U.S., the sum of all value-added for the U.S. economy in that year (i.e., income-side GDP) is \$21.43 trillion. The sum of industry sales (i.e., gross receipts) is \$37.82 trillion, 76.4 percent higher than GDP. Put another way, on average, U.S. total production costs contained 56.7 percent value-added content in that year. At the sectoral level, there is significant variation across industries in the relativities between these metrics. At the input-output level (close to NAICS 3-digit classification for around 71 distinct industry groups), the share of value-added content in total sales/costs ranges at the lower end from 17.5 percent for “Funds, Trusts and Other Financial Vehicles”, 20.8 percent for “Motor Vehicles, Bodies and Trailers, and Parts”, and 26.6 percent for “Primary Metals”, and up to the higher end from 87.4 percent for “Pipeline Transportation”, 78.0 percent for “Computer and Electronic Products”, and 76.7 percent for “Publishing Industries, except Internet (includes software)”.

Relying on gross receipts as a measure of economic contribution has some limitations. Consider an example: in 2019, “Food and Beverage and Tobacco Products” had gross receipts of \$969.7 billion (2.56 percent of total industry U.S. turnover) and value-added of \$265.0 billion (1.24 percent of GDP), while “Rental and Leasing Services and Lessors of Intangible Assets” had gross receipts of \$387.7 billion (1.03 percent of total U.S. turnover) and value-added of \$261.8 billion (1.22 percent of GDP). Although both industries constituted about the same share of GDP in 2019, reliance on a gross receipts metric would imply that “Food and Beverage and Tobacco Products” was 2.5 times “larger” than “Rental and Leasing Services and Lessors of Intangible Assets” as a contributor to the U.S. economy.¹¹



Combining and Reconciling Data Sources

In the absence of complete value-added data in MBE-reporting sources, payroll data are helpful for the national accounts concept in terms of labor costs, COE, but the other elements of value-added (and therefore income-side GDP) are buried in the data for gross receipts that include intermediate input costs. Hence it is necessary to exploit demographic distinctions from MBE data in order to split industry groups in more detailed economic data like the BEA Input-Output (IO) tables.

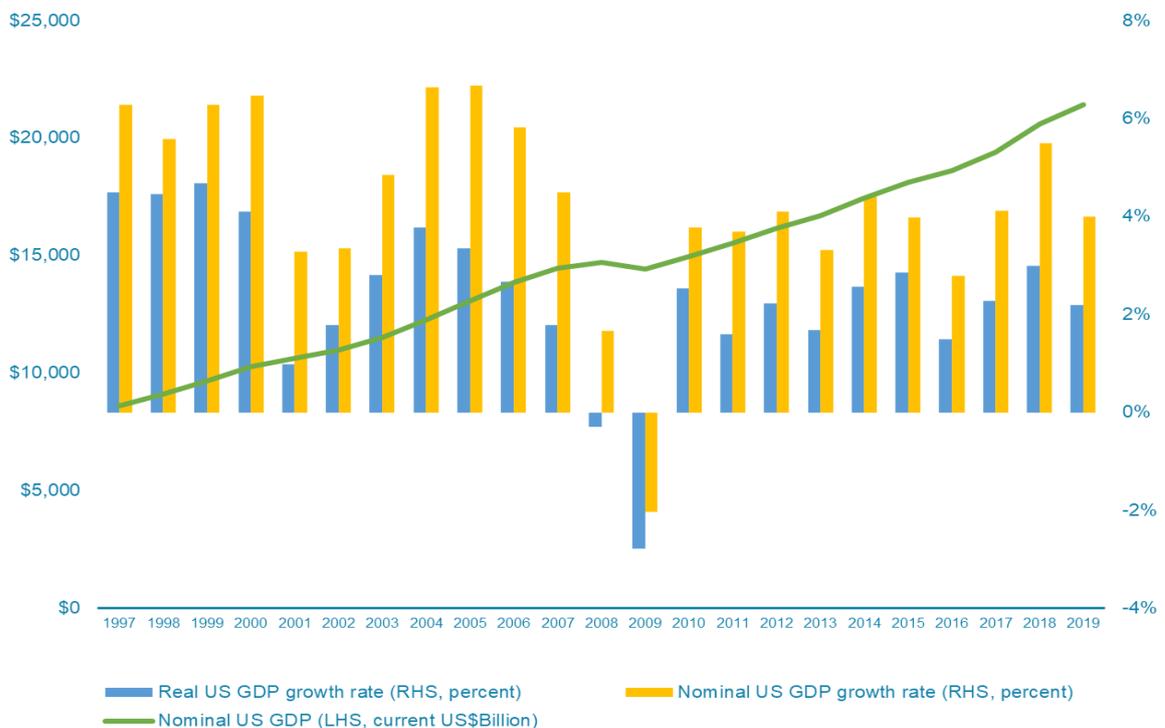
SBO data provides survey-based data for metrics including gross receipts, employment, and payroll at the 2-digit, 3-digit, 4-digit, 5-digit, and 6-digit NAICS level,¹² and at the state and county level for certain subsets. It does not provide data for other cost and value-added components of industry groups and is only available for a one-year snapshot every five years for three census years, the last of which is now almost a decade behind us.

Methodological context is important for understanding data. The U.S. Census SBO

methodology allows respondents to choose a self-identified race (such as Asian, African American, Native Hawaiian and Other Pacific Islander, American Indian and Alaska Native, and other race) and ethnicity (Hispanic, non-Hispanic).¹³ For example, a Hispanic owner who self-identifies as African American and owns 51 percent of a firm is recorded as both a Hispanic-owner and an African American owner. As a result, the sum of these parts is likely to be greater than the total across race categories due to double counting, and the U.S. Census Bureau also provides a separate estimate of the minority total alone. In this report, the Hispanic subgroup is treated as a single and separate racial group for descriptive purposes.

Tracking both the race and ethnicity of owners using a self-selected survey response over time is problematic. Evidence suggests that some respondents (particularly people of multiple ethnic origins) are uncertain about how to self-report their race and ethnicity. This sometimes leads to inconsistent racial/ethnic categorization survey-to-survey, impacting consistency and comparability across time.¹⁴ For example, between 2007 and 2012, there was an overall increase in the number of Hispanic owned firms, whereas other race

Figure 2. U.S. Gross Domestic Product, Level in U.S.\$ Billion and Annual Growth Rate in Percent, 1997-2019



Source: BEA Input-output accounts, World Bank World Economic Outlook

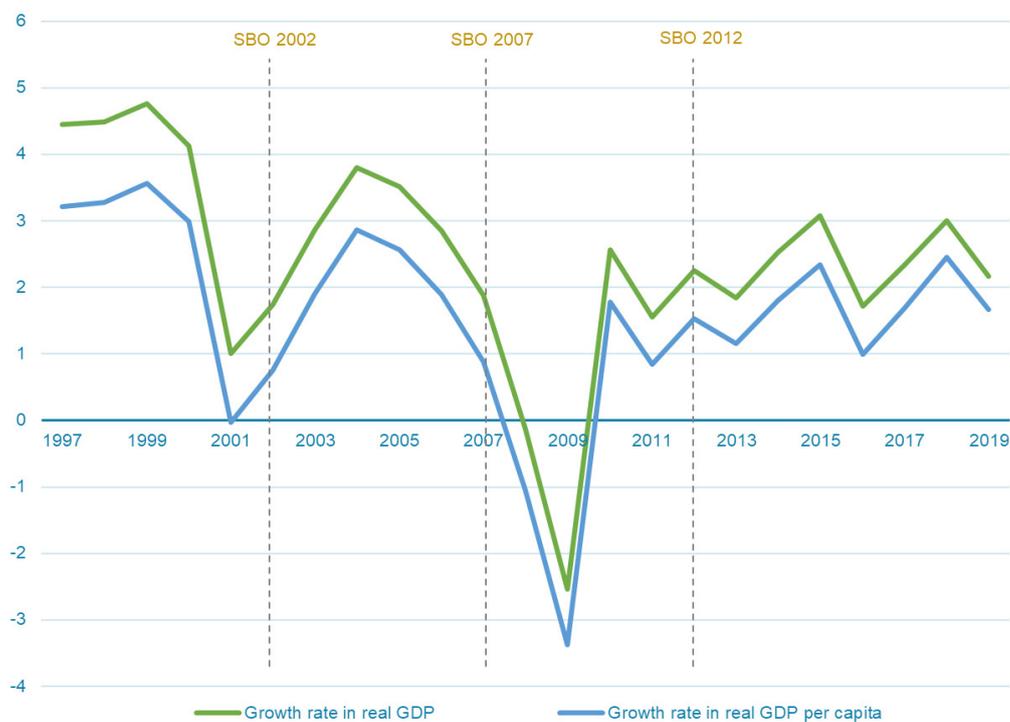
categories jointly reported with Hispanic ethnicity declined in number of firms. Hispanic respondents selecting “other race” increased from 2,667 to 67,019 (an increase of 2,413 percent) between 2007 and 2012, a significant change in the way Hispanics categorized themselves that had repercussions for the growth implied by the data for Asian, African American, Native Hawaiian and Other Pacific Islander, and American Indian and Alaska Native firms. That is, these races reported lower growth rates in MBE metrics between 2007 and 2012 than would otherwise have been the case. Data indicates that Hispanics do not constitute a large share of any SBO- or ASE-defined minority racial group and comprised less than 10 percent of all minority racial categories in 2012, but the change in attitudes to self-reporting ethnicity had material impacts on the data.

The Census methodology used to collate survey-based data in the SBO introduces some challenges when considering the composition of firm numbers by ownership subgroups in the dataset. According to Census methodology, “[f]irms with more than one domestic establishment are counted in each industry and geographic area in which

they operate, but only once in the total for all sectors and the totals at the national and state levels.”¹⁵ This inevitably leads to a degree of double counting in subtotals.¹⁶ Because non-employer firms are less likely to operate in several sector categories, this issue primarily impacts employer firm data in the SBO. The double-counting complicates the calculation of within-subgroup proportions for employer firms, particularly when aggregating from industry or geographic subgroups. For example, the total number of minority employer firms in the 2012 SBO survey was 908,800, but the sum of the firm numbers defined by industry group is 911,092, a difference of 0.25 percent. In order to avoid double-counting, it is assumed that the double-counting impacts are proportionate across industry sectors, which then allows aggregate totals calculated from the sum of the firm numbers in each sector to be used to estimate subgroup shares in totals.¹⁷

A key source of data for linkages between industry and macroeconomic data is provided by the collective BEA input-output (IO) tables. IO data provides detailed cost and sales information for 15-sector and 71-sector industry classifications (about NAICS 2-digit and 3-digit, respectively), reported on an

Figure 3. Annual Growth Rates in Real GDP and Real GDP Per Capita, Percent (%), 1997-2019



Source: World Bank World Economic Outlook



annual basis, and for 405 sectors at five-year intervals in “benchmark” tables reported for census years. In all three cases, these data include the breakdown of value-added by sector using definitions common to the national macroeconomic accounting methods, providing direct linkages to the national macroeconomic and industry accounts. They do not, however, distinguish the demographic characteristics of entrepreneurs and workers.

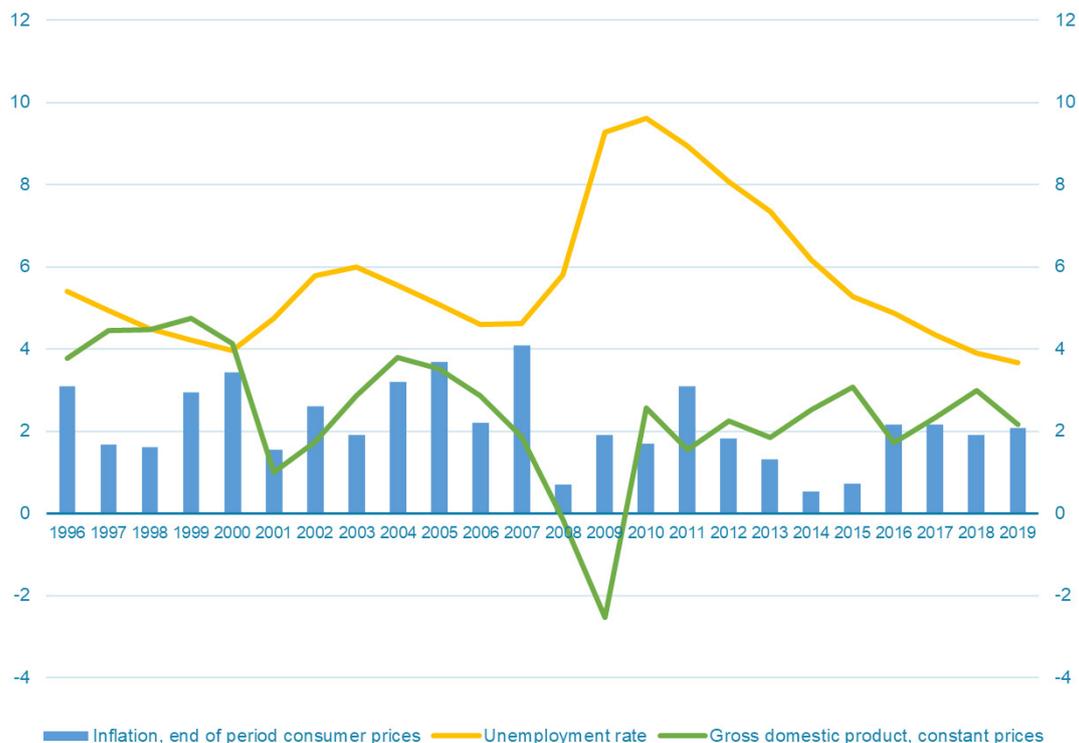
Further Background on the Role of Macroeconomic Context with Limited Data

Integrating the MBE-specific and IO data requires reconciling the limited frequency of the SBO and ASE. The 15-sector and 71-sector IO data is available in a format consistent across time for annual time series data beginning 1997 and ending 2019, with a new release usually late in the calendar year annually. SBO data, however, are available at three points in time, five years apart (2002, 2007, and 2012).

An economic system is an integrated network of expenditure and production linkages. When assessing the history of a subset of this complex, integrated system, it is important to internalize the broader macroeconomic context within which the system’s component history played-out. With the SBO data issued only for Census years 2002, 2007, and 2012, any potential for extracting trends requires knowing the underlying trajectory of the economy across this time span.

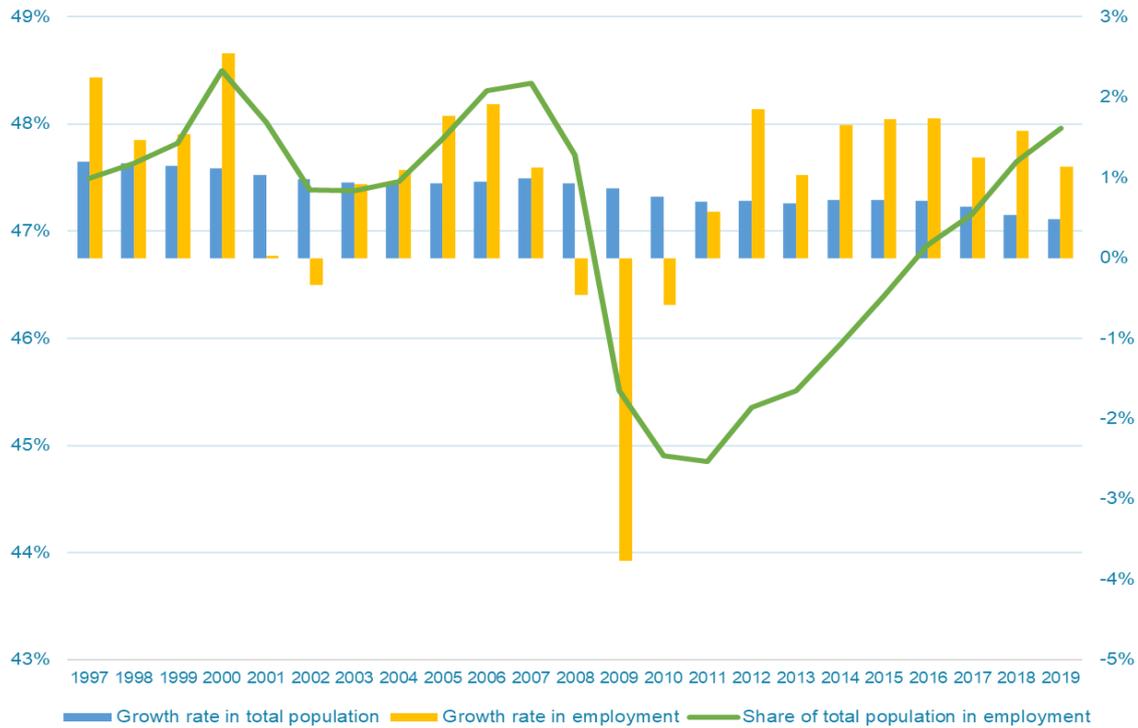
Between 2002 and 2012, the U.S. economy passed through two economic crises. The first was the “bursting” of the dot-com bubble in

Figure 4. Selected U.S. Macroeconomic Aggregates: Unemployment, Real GDP Growth, and Consumer Price Inflation, 1996-2019



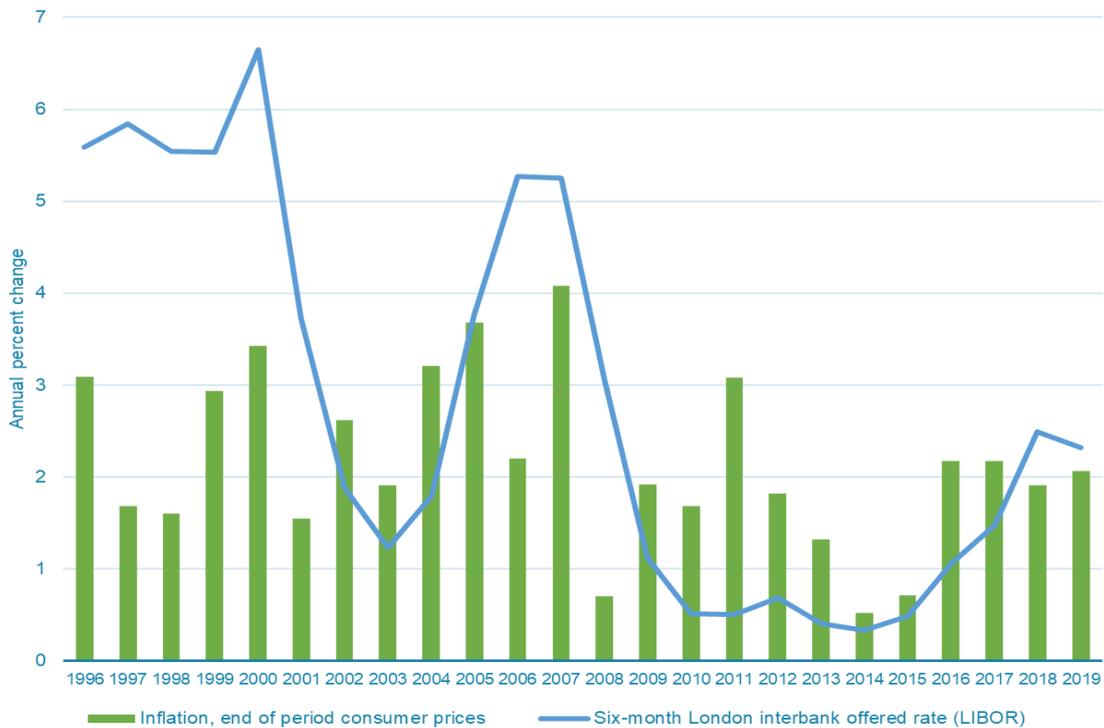
Source: World Bank World Economic Outlook

Figure 5. U.S. Population Growth, Employment Growth, and Employment Share in Total Population, in Percent, 1997-2019



Source: World Bank World Economic Outlook

Figure 6. Key U.S. Monetary Indicators: Interest Rates and Inflation, 1996-2019



Source: World Bank World Economic Outlook

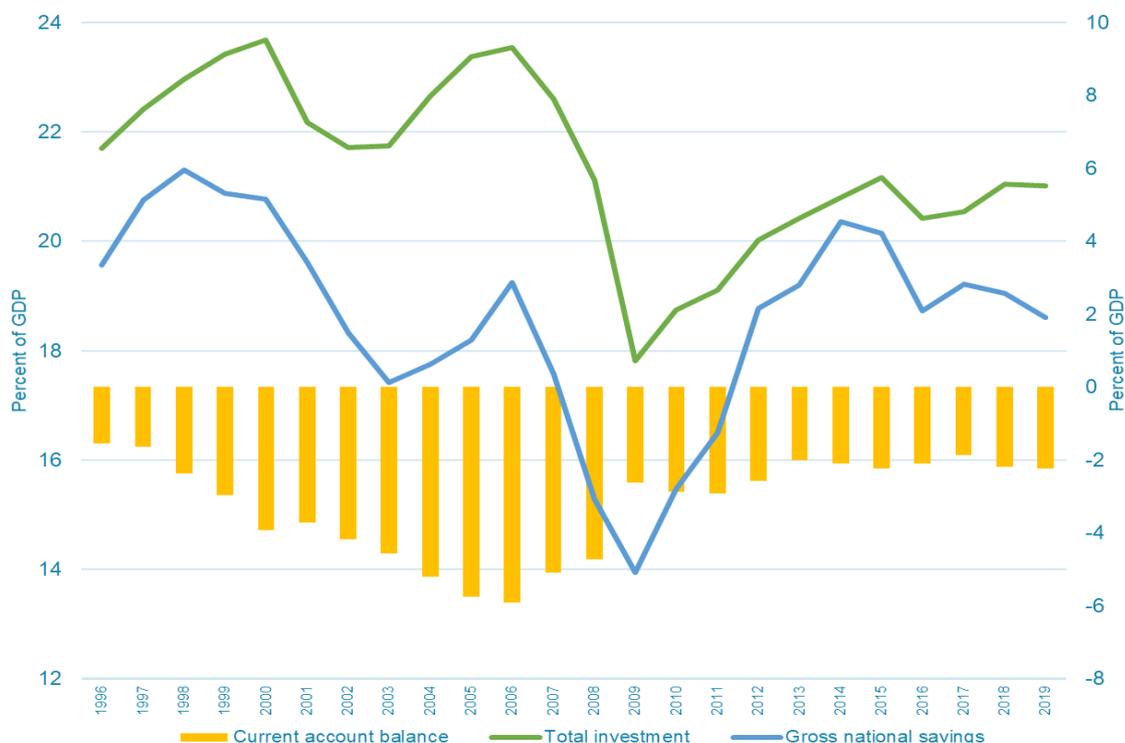
2000/01 from which the economy recovered quickly. The second was the “Great Recession” in 2008/09,¹⁸ a historically significant economic crisis that continues to have implications for U.S. economic performance to the present day. The impacts of the Great Recession are particularly consequential for the data reconciliation task under discussion here.

Figure 2 shows a time series for the level of U.S. GDP in nominal (current) dollars along with nominal and real growth rates in GDP¹⁹ between 1997 and 2016. Figure 3 charts U.S. growth rates in nominal and real GDP per capita, a function of total population growth and the growth in real and nominal GDP. Per-capita data are provided to offer a sense of the year-to-year change in actual economic welfare.²⁰ Evident is the collapse of the so-called “dot-com bubble” leading to a period of restrained economic growth in the United States through 2001 and 2002: in seasonally adjusted terms, the 12-month blocks of time preceding Q1 and Q3 of 2001 respectively were periods of negative real GDP growth.

The 9/11 attacks also occurred during this period, adding to pressures on macroeconomic performance. Also evident in 2008/09 is the most significant economic crisis since the Great Depression. U.S. real GDP growth was negative for much of 2008 and 2009, with 5 out of 6 quarters recording negative annualized growth rates between Q1 2008 and Q2 2009.

Figures 4 and 5 provide some context for the U.S. labor market. The U.S. unemployment rate rose to near 6 percent in the years following 9/11 and the dot-com bubble before falling through 2007. Unemployment again rose to 6 percent in 2008 in the early stages of the crash and to near 10 percent through 2009/10. Unemployment did not return to pre-crisis levels until 2017. The U.S. participation rate fell over 3 percentage points and was slow to recover as workers remained discouraged for many years. In addition, the severity of the recession had real and lasting structural impacts in the labor market - driven by structural changes in U.S. industry composition, certain

Figure 7. U.S. Gross National Saving, Investment, and Current Account Balance, Percent of GDP, 1996-2019



Source: World Bank World Economic Outlook

occupation types suffered larger and more permanent reductions in demand, leading to mismatches emerging between the skills of the unemployed and those demanded by employers. This is a phenomenon known as “structural unemployment,” a characteristic of deep recessions that leads to persistence in unemployment generally along with increased levels of long-term unemployed, and to deeper and longer declines in participation rates.

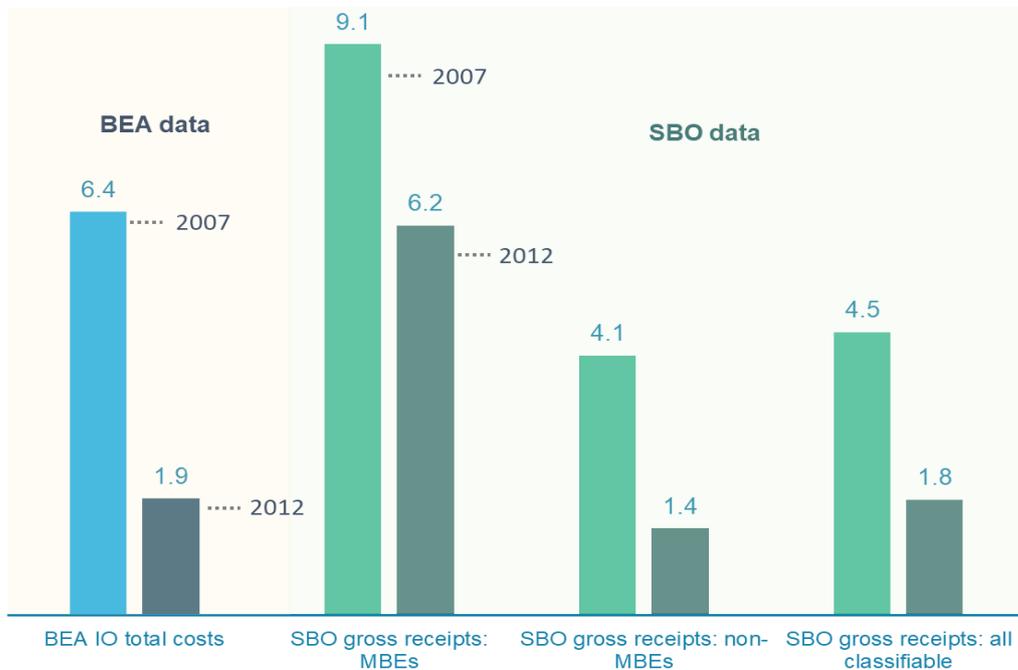
Inflation trended slightly lower on average over the 2008-2017 period and was a little more volatile year-to-year compared to the previous ten years (Figure 6). This occurred during a period of low interest rates as the Federal Reserve implemented an ongoing monetary stimulus program to support demand and ease credit constraints. Importantly, the combination of low inflation rates coupled with “loose” monetary policy during this period signaled an economy with very weak aggregate demand.

The crisis had started in debt markets and caused a collapse in investment spending as a share of GDP (Figure 7), falling from near 24 percent in 2007 to less than 18 percent of GDP in 2009. Investment as a share of GDP

has trended lower since, a significant structural change in the economy.

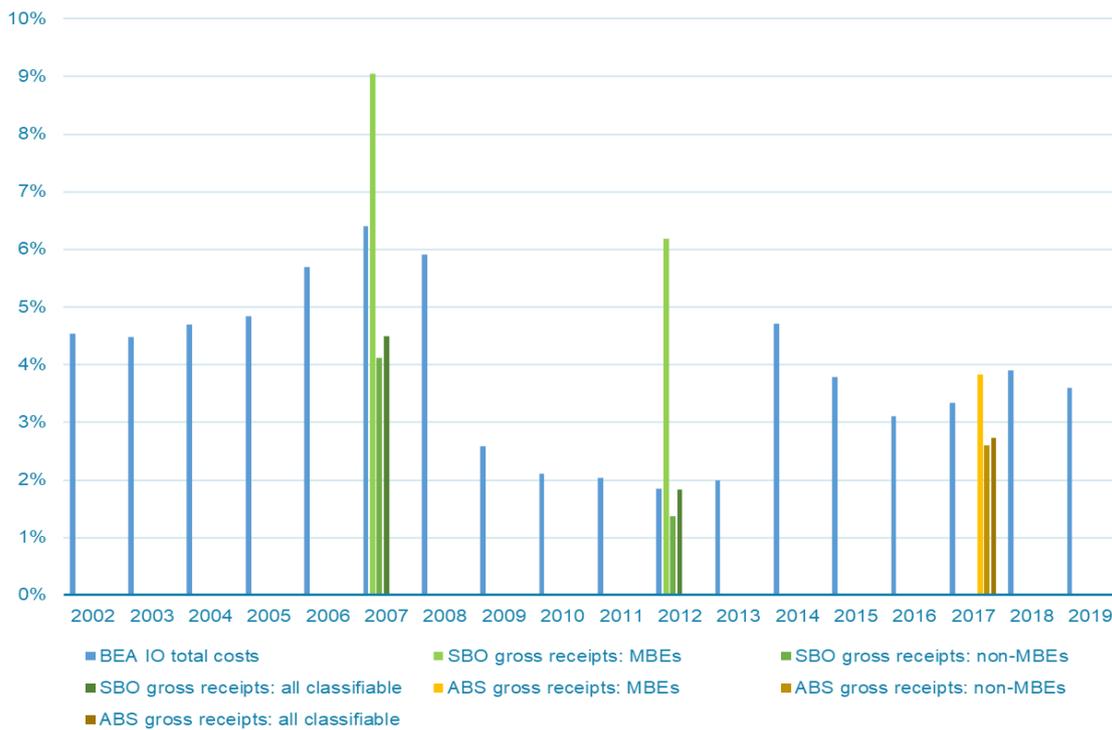
Financial asset and housing prices fell substantially, leading to sharp declines in household wealth and spurring households to increase savings from 3 percent of disposable income in early 2008 to 12 percent in late 2012. Such a large increase in saving with an underlying fall in household income resulted in a significant decline in consumption spending. Economists refer to this relationship between household wealth and consumption, somewhat unimaginatively, as the “Wealth Effect”. In addition, the usual saving-investment nexus was weakened: saving is the source of funds for investment, but in a recession of this magnitude investment demand is inevitably weak also. The increased availability of savings offered at near zero real-interest rates could not find willing borrowers in investment markets. This led to “secular stagnation” as deep, underlying shifts in expectations and confidence curtailed price responsiveness and “reset” the baselines for saving and investment.

Figure 8. Calculated Annual Growth Rates in Production Costs and Gross Receipts for 2007 and 2012 (%)



Source: Calculations from BEA Input-output accounts and Census SBO data for employer firms

Figure 9. Calculated Annual Growth Rates in Production Costs and Gross Receipts (2)



Source: Calculations from BEA Input-output accounts and Census SBO data for employer firms

As the crisis became a global phenomenon, demand for U.S. exports weakened appreciably.

The result was that by early 2009, the U.S. economy was experiencing weakness in most of the sources of aggregate demand, and as producers found it increasingly hard to find buyers, a supply-side contraction unfolded with a cascading process of lay-offs and business failures. With persistent weakness in private consumption, investment, and exports, only public-sector spending was left to support aggregate demand. This is the primary motivation for government stimulus spending. The massive stimulus packages implemented by the federal government were intentionally designed to generate large fiscal deficits financed by debt. Essentially, the aim was to use debt instruments to “transfer” resources from future taxpayers and finance outlays by the sole remaining source of discretionary spending – the public sector.

The implication is that the three SBO datasets reported MBE performance for three years of very different underlying macroeconomic performance. Draw a vertical line on any of these charts in 2002, 2007, and 2012, and the levels of, relationships between, and rates

and direction of change in variables can be quite different. The SBO 2002 data reflected an economy beginning a recovery from 9/11 and a bursting equity market bubble. The SBO 2007 reported on an overheating economy on the precipice of a historic collapse, a result of run-away financial contagion from deep imbalances in debt and derivative markets and an unsustainable private sector balance sheet. The SBO 2012 reported on an economy still struggling with weak domestic and international demand, poor consumer and investor confidence, flat wage growth, and low inflation with near-zero real interest rates and suffering from “secular stagnation”.

Assessing Data Alignment Across Time

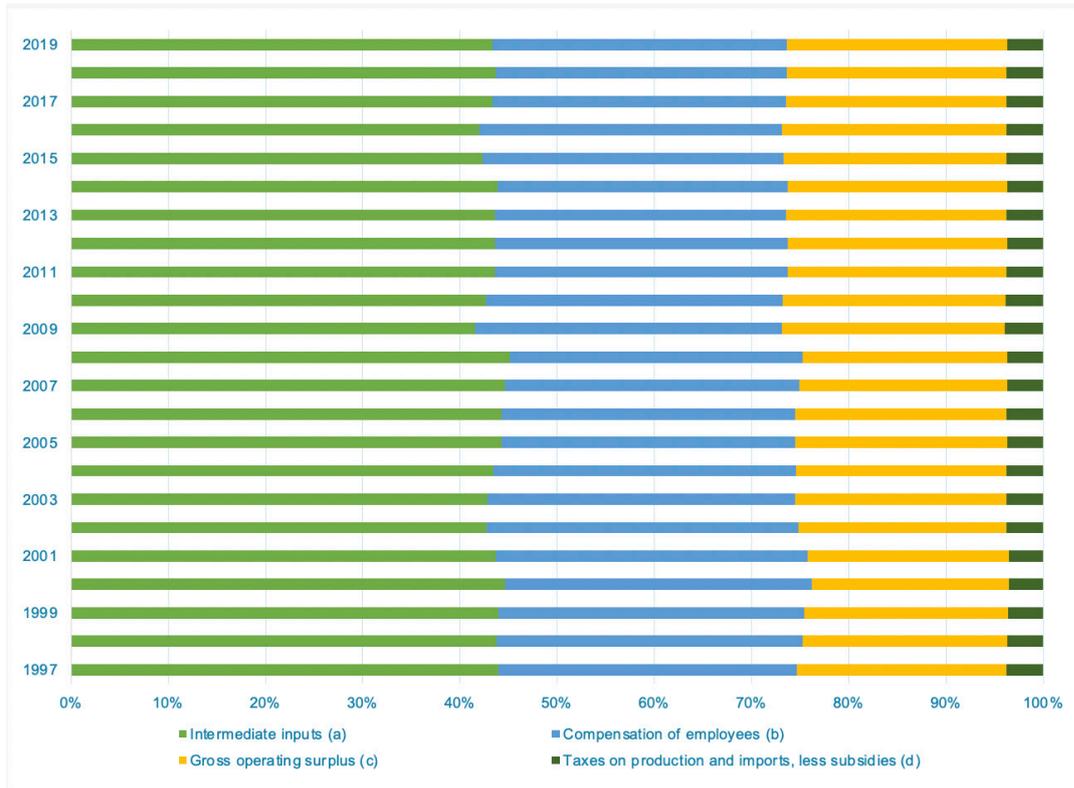
Given the contextual knowledge discussed above, a reasonable starting point in generating the information needed to link MBEs to GDP is to create static “snapshots” for SBO years and assess the alignments across the various data sources. The SBO data lacks all the information required to split the IO tables directly, and therefore, inevitably, there will be some error inherent in the merging process.

Table 3. Components of GDP and U.S. Total Economic Activity, current U.S. \$ millions, 1997-2019

Years	Intermedi- ate inputs (a)	Compen- sation of employees (b)	Gross operating surplus (c)	Taxes on production and im- ports, less subsidies (d)	Gross domestic product (total value- added) (b+c+d)	Total costs (a+b+c+d)
1997	6,746,913	4,719,087	3,311,630	577,809	8,608,526	15,355,439
1998	7,082,089	5,082,390	3,403,676	603,107	9,089,173	16,171,262
1999	7,584,173	5,417,484	3,614,768	628,376	9,660,628	17,244,801
2000	8,279,786	5,863,150	3,758,917	662,717	10,284,784	18,564,570
2001	8,241,298	6,053,753	3,899,106	668,968	10,621,827	18,863,125
2002	8,197,482	6,149,709	4,106,594	721,213	10,977,516	19,174,998
2003	8,624,403	6,372,708	4,379,020	758,948	11,510,676	20,135,079
2004	9,422,354	6,748,782	4,708,596	817,551	12,274,929	21,697,283
2005	10,421,159	7,097,916	5,122,194	873,621	13,093,731	23,514,890
2006	11,032,065	7,513,699	5,401,717	940,478	13,855,894	24,887,959
2007	11,673,664	7,908,769	5,588,891	979,980	14,477,640	26,151,304
2008	12,107,115	8,089,962	5,639,266	989,360	14,718,588	26,825,703
2009	10,238,498	7,795,660	5,655,285	967,802	14,418,747	24,657,245
2010	11,129,142	7,969,485	5,993,643	1,001,249	14,964,377	26,093,519
2011	12,018,047	8,277,115	6,198,255	1,042,561	15,517,931	27,535,978
2012	12,507,995	8,618,539	6,462,692	1,074,019	16,155,250	28,663,245
2013	12,909,670	8,851,860	6,724,015	1,115,646	16,691,521	29,601,191
2014	13,606,391	9,267,014	6,997,040	1,163,553	17,427,607	31,033,998
2015	13,310,724	9,719,994	7,202,195	1,198,520	18,120,709	31,431,433
2016	13,460,452	9,992,231	7,406,037	1,226,200	18,624,468	32,084,920
2017	14,931,753	10,433,094	7,805,796	1,304,089	19,542,979	34,474,732
2018	15,991,546	10,960,567	8,269,831	1,381,463	20,611,861	36,603,407
2019	16,383,760	11,444,495	8,571,191	1,417,539	21,433,225	37,816,985

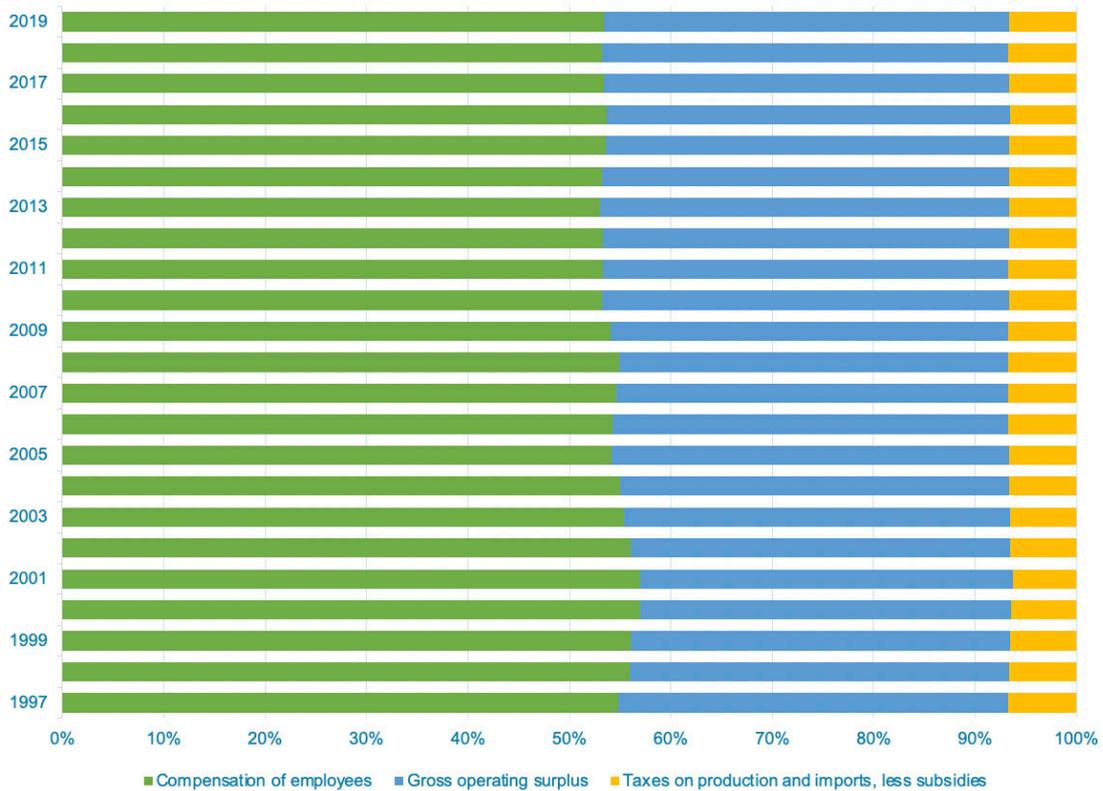
Source: BEA Input-Output accounts

Figure 10: Components of Aggregate U.S. Industry Costs, percent of total, 1997-2019



Source: Calculations from BEA Input-output accounts

Figure 11: Components of GDP (value-added), percent of total, 1997-2019



Source: Calculations from BEA Input-output accounts

Figure 12: Growth Rates in U.S. Multifactor Productivity, 2001-2019



Source: Calculated from BLS Combined Sectors and Industry KLEMS Multifactor Productivity Tables by Measure

The (likely) errors are commensurate with the differences in the dynamics of the MBE data from the economy-wide and non-MBE averages for key metrics.

The trajectory of IO and SBO data in the SBO years provide helpful insight in this regard. Macroeconomic data normally is subject to fairly high levels of inertia: knowing that this was true for the years between SBO releases would be helpful in merging the IO and SBO datasets. Figure 8 compares calculated average annual growth rates for total costs and gross receipts data across the five-year periods 2002-2007 and 2007-2012 for both SBO and IO data. Within these five-year slices of time, there is a pattern of declining average annual growth rates that is relatively less pronounced for MBEs. Context provided by the SBO data itself suggest that this reflects, in part, that the number of MBE firms increased significantly in comparison to non-MBEs.

Figure 9 adds the BEA data for intervening years from a calculated set of rolling five-year average growth rates in BEA total costs data and replots the growth rates for MBEs, non-MBEs, and all classifiable firms. The movement in the charted series suggests

that changes in the performance of the MBE sector and other classifiable firms over time is generally aligned to the underlying performance of the economy.²¹

Another source of stability in the macro and industry data is the structure of income-side GDP over time. The growth rates exhibit year-to-year volatility (Figure 9), but the composition of the economy as it cycles at the macroeconomic level tends to be stable. Table 3 contains data on components of total industry costs and the income-side definition of GDP for a 20-year period from 1997 to 2016, inclusive. Figures 10 and 11 chart the proportions of these factors in GDP and total costs over the same period.

The shares are reasonably stable across time. This structural stability is a characteristic of a mature, developed economy. Earlier stages of economic development see nations passing through periods of industrialization, urbanization, and rapid technological progress that are inherently volatile. The U.S. economy tends to operate on or near its “frontier.” Hence, the proportions of these income-side components of GDP and intermediate inputs, as well as for the expenditure-side components

Table 4. Average Annual Growth Rates Using the BEA Input-Output and SBO Data, 2007-2012

Source	Variable	2007 (US million\$)	2012 (US million\$)	Average Annual Growth
BEA Input-Output	Total Costs	26,151,304	28,663,245	1.85%
	GDP	14,477,625	16,155,250	2.22%
	Intermediate	11,673,664	12,507,995	1.39%
	COE	7,908,769	8,618,539	1.73%
	Indirect Tax	979,980	1,074,019	1.85%
	GOS	5,588,891	6,462,692	2.95%
SBO all employer firms	Gross receipts	29,058,828	32,495,262	2.26%
	Payroll	4,822,817	5,236,446	1.66%
SBO MBE employers	Gross receipts	860,492	1,161,431	6.18%
	Payroll	164,065	219,298	5.98%
SBO Nonminority employers	Gross receipts	9,154,651	9,803,154	1.38%
	Payroll	1,776,508	1,877,145	1.11%

Sources: BEA Input-output accounts, Census SBO, authors' calculations

(private and public consumption, investment, and the balance of foreign trade), tend to be more stable over time.

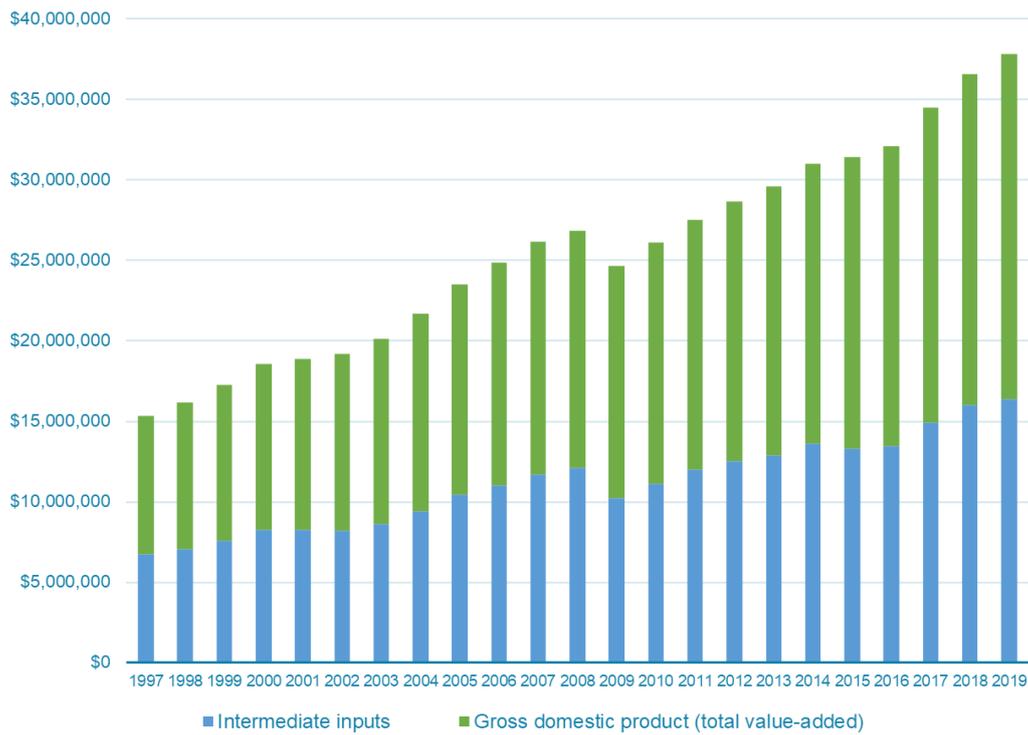
For the MBE cohort that forms a subset of these data, it is likely that these proportional relationships will exhibit more variability over time, for a range of reasons. For example, because MBEs are growing from a lower base in many of the performance metrics, there is likely to be a more rapid rate of change in industry composition (i.e., the distribution of industries in which MBEs operate businesses). As MBEs grow and gain greater access to finance, opportunities to move into sectors that require higher levels of startup capital or access to overdraft and other operational credit facilities become available.²²

Some contextual information can be “guesstimated” for an initial pass by reasonable rules of thumb, and then checked against the implications of available data indirectly. Underlying industry growth by racial cohort is a good candidate. A useful rule of thumb for potential business-as-usual growth in real GDP is found in adding together working-age population and multifactor productivity growth rates. In simple terms, a producer using

inputs of labor, capital, and intermediate inputs to produce output can increase the level of production by adding more inputs and/or by making more output per unit of these inputs: the latter case describes the concept “multifactor productivity.” Figure 11 shows that the relativities between labor and capital inputs change slowly over time (in the case of the U.S., with an expected increase in capital intensity), and population data is closely linked to labor supply. With U.S. working-age population growth currently near 1 percent per annum, and the longer-run trend in U.S. private-sector multifactor productivity generally varying between 0.5 and 1 percent per annum (Figure 12), business-as-usual potential U.S. real GDP growth (in the absence of a technological shock) is of the order of 1.5 to 2.0 percent.

By comparison, the growth rate in the minority working-age population is approaching 3 percent. Assuming for illustrative purposes that multifactor productivity growth is occurring in MBEs at rates like those in the aggregate economy, but maybe slightly higher, real value-added growth in minority businesses overall should be closer to 4 percent per

Figure 13: GDP and Total Costs for the U.S. Economy, 1997-2019



Source: Calculations from BEA Input-output accounts

Figure 14: Annual Growth Rates in Production Costs and Nominal GDP for the U.S. Economy, 1998-2018



Source: Calculations from BEA Input-output accounts

Figure 15: Annual Growth Rates in Labor Compensation and Nominal GDP for the U.S. Economy, 1998-2019



Source: Calculations from BEA Input-output accounts

annum (i.e., 3 percent population growth plus 1 percent productivity growth).

Table 4 reports average annual growth rates from the BEA input-output accounts and SBO data across the five-year period from 2007 to 2012. The intuition seems to broadly hold in the following sense. First, adjust the current-dollar values reported in Table 2 (reflecting the change in both levels of output and prices) to reflect real growth (only changes in the level of output) by deflating for an average annual change in producer prices (informed by GDP deflator data) of about 1.5 to 1.6 percent across the period.²³ This generates estimates for MBE gross receipts growth of around 4.6 percent, for non-MBE firms around -0.1 percent, and for the whole economy around 0.3 percent in gross receipts and 0.7 percent for GDP. Given that growth rates in MBE firm numbers are a little higher than population growth for minority groups across this period, and that the opposite was true for non-MBE firms, these rule-of-thumb estimates are remarkably consistent with nominal growth rates.

Combining Information from the SBO and BEA Datasets

The section above demonstrates the empirical relationship between MBE data and national accounts data. This section considers gross receipts and payroll, which are the two best candidates for the transfer of compositional information on race cohorts from the SBO to the IO accounts. To merge the data, (i) gross receipts and/or payroll data should track GDP in a stable manner through time, and (ii) SBO gross receipts and payroll data should align with BEA input-output data for total costs and compensation of employees.

Figure 13 plots the annual time series for GDP, intermediate inputs, and total costs (the sum of the former two) in current dollars²⁴ and Figure 14 reports the annual growth rates in total costs and GDP. The data underlying Figures 13 and 14 show that GDP has remained a stable proportion of total costs for the United States over the last 20 years, varying between 55 and 58 percent of total costs. Also apparent from the growth rates charted in Figure 14 is that these series move broadly together across

Table 5: Remapped and Scaled 20-Sector BEA Input-Output Data, in U.S.\$, 2012

All employer firms	Total Inter- mediate	Compen- sation of employ- ees	Taxes on produc- tion and imports, less sub- sidies	Gross operating surplus	Total costs	Total value added
Total for all sectors	\$10,176,737	\$6,667,854	\$857,306	\$4,039,306	\$21,741,204	\$11,564,466
Mining, quarrying, and oil and gas extraction	\$156,332	\$90,502	\$39,048	\$275,533	\$561,416	\$405,083
Utilities	\$103,520	\$69,766	\$58,063	\$134,758	\$366,107	\$262,587
Construction	\$447,758	\$366,610	\$6,645	\$193,211	\$1,014,224	\$566,466
Wholesale trade	\$478,032	\$457,925	\$190,534	\$311,255	\$1,437,746	\$959,714
Information	\$623,555	\$271,627	\$44,024	\$417,654	\$1,356,860	\$733,305
Real estate and rental and leasing	\$406,650	\$98,957	\$25,791	\$270,736	\$802,134	\$395,484
Professional, scientific, and technical services	\$582,926	\$776,207	\$25,699	\$298,360	\$1,683,192	\$1,100,266
Management of compa- nies and enterprises	\$226,748	\$259,102	\$8,905	\$36,274	\$531,029	\$304,281
Administrative, support, waste management, re- mediation	\$252,936	\$341,473	\$9,827	\$120,626	\$724,862	\$471,925
Educational services	\$112,538	\$160,959	\$7,853	\$13,560	\$294,910	\$182,372
Health care and social assistance	\$756,734	\$964,387	\$23,899	\$159,374	\$1,904,394	\$1,147,659
Arts, entertainment, and recreation	\$97,654	\$86,195	\$15,194	\$46,380	\$245,423	\$147,769
Accommodation and food services	\$357,701	\$282,765	\$57,739	\$95,374	\$793,578	\$435,877
Agriculture, forestry, fish- ing and hunting	\$9,037	\$20,292	\$1,205	\$9,294	\$39,828	\$30,791
Manufacturing	\$3,845,041	\$917,942	\$82,149	\$979,981	\$5,825,113	\$1,980,072
Retail trade	\$505,260	\$510,646	\$187,835	\$224,854	\$1,428,595	\$923,335
Transportation and ware- housing	\$433,730	\$252,790	\$24,173	\$135,421	\$846,114	\$412,383
Finance and insurance	\$608,986	\$487,792	\$34,662	\$253,522	\$1,384,962	\$775,976
Other services (except public administration)	\$171,596	\$251,917	\$14,063	\$63,140	\$500,716	\$329,120

Sources: BEA Input-output accounts, Census SBO, authors' calculations

Table 6: Remapped and Scaled 20-Sector BEA Input-Output Data — Share of Total Input Use Accounted For By Sector (Column Shares), 2012

All employer firms	Total Inter- mediate	Compensation of employees	Taxes on production and imports, less sub- sidies	Gross operating surplus	Total costs	Total value added
Total for all sectors	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Mining, quarrying, and oil and gas extraction	1.54%	1.36%	4.55%	6.82%	2.58%	3.50%
Utilities	1.02%	1.05%	6.77%	3.34%	1.68%	2.27%
Construction	4.40%	5.50%	0.78%	4.78%	4.66%	4.90%
Wholesale trade	4.70%	6.87%	22.22%	7.71%	6.61%	8.30%
Information	6.13%	4.07%	5.14%	10.34%	6.24%	6.34%
Real estate and rental and leasing	4.00%	1.48%	3.01%	6.70%	3.69%	3.42%
Professional, scientific, and technical services	5.73%	11.64%	3.00%	7.39%	7.74%	9.51%
Management of compa- nies and enterprises	2.23%	3.89%	1.04%	0.90%	2.44%	2.63%
Administrative, support, waste management, reme- diation	2.49%	5.12%	1.15%	2.99%	3.33%	4.08%
Educational services	1.11%	2.41%	0.92%	0.34%	1.36%	1.58%
Health care and social as- sistance	7.44%	14.46%	2.79%	3.95%	8.76%	9.92%
Arts, entertainment, and recreation	0.96%	1.29%	1.77%	1.15%	1.13%	1.28%
Accommodation and food services	3.51%	4.24%	6.73%	2.36%	3.65%	3.77%
Agriculture, forestry, fish- ing and hunting	0.09%	0.30%	0.14%	0.23%	0.18%	0.27%
Manufacturing	37.78%	13.77%	9.58%	24.26%	26.79%	17.12%
Retail trade	4.96%	7.66%	21.91%	5.57%	6.57%	7.98%
Transportation and ware- housing	4.26%	3.79%	2.82%	3.35%	3.89%	3.57%
Finance and insurance	5.98%	7.32%	4.04%	6.28%	6.37%	6.71%
Other services (except public administration)	1.69%	3.78%	1.64%	1.56%	2.30%	2.85%

Sources: BEA Input-output accounts, Census SBO, authors' calculations

Table 7: Remapped and Scaled 20-Sector BEA Input-Output Data — Cost Share Structure of the Industry Groups by Value-Added Component and Intermediate Inputs (Row Shares)

All employer firms	Total Intermediate	Compensation of employees	Taxes on production and imports, less subsidies	Gross operating surplus	Total costs	Total value added
Total for all sectors	46.81%	30.67%	3.94%	18.58%	100.00%	53.19%
Mining, quarrying, and oil and gas extraction	27.85%	16.12%	6.96%	49.08%	100.00%	72.15%
Utilities	28.28%	19.06%	15.86%	36.81%	100.00%	71.72%
Construction	44.15%	36.15%	0.66%	19.05%	100.00%	55.85%
Wholesale trade	33.25%	31.85%	13.25%	21.65%	100.00%	66.75%
Information	45.96%	20.02%	3.24%	30.78%	100.00%	54.04%
Real estate and rental and leasing	50.70%	12.34%	3.22%	33.75%	100.00%	49.30%
Professional, scientific, and technical services	34.63%	46.12%	1.53%	17.73%	100.00%	65.37%
Management of companies and enterprises	42.70%	48.79%	1.68%	6.83%	100.00%	57.30%
Administrative, support, waste management, remediation	34.89%	47.11%	1.36%	16.64%	100.00%	65.11%
Educational services	38.16%	54.58%	2.66%	4.60%	100.00%	61.84%
Health care and social assistance	39.74%	50.64%	1.25%	8.37%	100.00%	60.26%
Arts, entertainment, and recreation	39.79%	35.12%	6.19%	18.90%	100.00%	60.21%
Accommodation and food services	45.07%	35.63%	7.28%	12.02%	100.00%	54.93%
Agriculture, forestry, fishing and hunting	22.69%	50.95%	3.03%	23.34%	100.00%	77.31%
Manufacturing	66.01%	15.76%	1.41%	16.82%	100.00%	33.99%
Retail trade	35.37%	35.74%	13.15%	15.74%	100.00%	64.63%
Transportation and warehousing	51.26%	29.88%	2.86%	16.01%	100.00%	48.74%
Finance and insurance	43.97%	35.22%	2.50%	18.31%	100.00%	56.03%
Other services (except public administration)	34.27%	50.31%	2.81%	12.61%	100.00%	65.73%

Sources: BEA Input-output accounts, SBO, authors' calculations

time but with some additional volatility evident in the total costs data - which, by deduction, must be due to volatility in the value of intermediate inputs being higher than volatility in value-added.

Figure 15, similarly, charts the relationship between growth rates in BEA data for compensation-of-employees and GDP through time. The chart provides a sense of the stability of the labor share of GDP year-to-year. The alignment across time here is much tighter. This is once again unsurprising: payroll is a more significant share of GDP than of total costs, and direct driver of GDP. This supports the implication that intermediate costs drive more volatility in the total costs data. Part of the higher variation in intermediate input values is due to the relatively high volatility of goods and services prices versus COE data, and the underlying “technology” of production reflected in the unit-inputs in production (rather than the value of inputs) would be expected to be more stable.

Both total costs and compensation of employees track closely with GDP for reasons outlined above.

Merging the Data

Below is a description of how the SBO and BEA national and industry accounts data are reconciled and combined.

Firstly, using the BEA NAICS codes, the data in the 3-digit classification of the 71-sector input-output tables are remapped into NAICS 2-digit sectors to make them directly comparable with SBO data on a sectoral basis.²⁵ The technical mappings from 3-digit to 2-digit NAICS are readily available online from the BEA.

The SBO microdata release provides industry at higher levels of industry sector disaggregation, at 3-digit, 4-digit, 5-digit, and 6-digit NAICS levels. At these higher levels of disaggregation, privacy and practical sampling issues create challenges. As the sectoral level of detail is increased, the number of firms in each more finely defined industry and race category falls, in some cases to few enough firms that the data could reveal private information like the revenues of individual closely held firms. As a result, there are increasing amounts of omitted data as the NAICS disaggregation gets more detailed. The choice was made to use 20-sector

disaggregation (based on NAICS 2-digit codes) reported in the general SBO dataset for the “completeness” of the SBO data at that level, but future work could certainly expand on this detail in collaboration with the source agencies.

The remapping of the input-output data also involves adjustments for missing observations in the SBO, such as the removal of 3-digit NAICS sectors from the BEA statistics that are “out of scope” in the SBO survey.²⁶ For context, the 2012 SBO documentation notes that “Crops and Animal Farming”—essentially, the “Farms” sector in the NAICS 3-digit data—was out of scope (i.e., no data was collected), resulting in around 90 percent of the input-output tables’ agriculture sector (representing approximately 0.9 percent of GDP) being omitted from the SBO dataset.

In addition, the differences in methodology and coverage in the SBO and BEA tables create discrepancies between the datasets. For example, the BEA national accounts data reports a 3-digit NAICS sector called Housing Services that captures the “imputed rents”. Imputed rents are essentially an estimate of the economic benefits of the flow of “capital services” from owner-occupied dwellings. Owner-occupied housing is a significant proportion of the national fixed capital stock and national wealth, and the services that flow from this capital are a major contributor to GDP as a component of GOS. Imputed rents are a statistical adjustment meant to capture a flow of economic benefits that occurs without any direct transactions taking place, so there are simply no business owners to survey. The omission in the SBO results in approximately 9.6 percent of GDP – the GOS of the owner-occupied housing sector - being absent from the SBO database.

The remapped and rescaled 20-sector data for employer firms is provided below in Table 5. In addition, Table 6 reports the share of total input use accounted-for by a sector (column shares), whereas Table 7 displays the cost structure of the industry groups by value-added component and intermediate inputs (row shares). The remapping and rescaling process addresses some of the methodological issues that make cross-referencing SBO data to the national accounts difficult. A summary of the data alignment is provided in Table 6 to highlight some key issues.

For example, the largest sector in the original SBO data for 2012 is Wholesale Trade: at \$7,961 billion in gross receipts in 2012, this

Table 8: Alignment Between SBO Gross Receipts and BEA Total Costs, in U.S.\$ million, 2012

NAICS 2-digit Sector	SBO Gross Receipts	Allocated IO Total Costs	Level Gap	Ratio SBO/IO
Total for all sectors	33,536,849	22,518,590	11,018,259	149%
Mining, quarrying, and oil and gas extraction	595,179	570,183	24,996	104%
Utilities	528,414	366,514	161,900	144%
Construction	1,486,863	1,069,895	416,968	139%
Wholesale trade	7,960,695	1,443,236	6,517,459	552%
Information	1,254,739	1,366,653	(111,914)	92%
Real estate and rental and leasing	717,412	1,133,186	(415,774)	63%
Professional, scientific, and technical services	1,723,942	1,762,939	(38,997)	98%
Management of companies and enterprises	307,226	531,029	(223,803)	58%
Administrative and support and waste management and remediation services	740,649	747,270	(6,621)	99%
Educational services	272,223	299,020	(26,797)	91%
Health care and social assistance	1,945,239	1,935,797	9,442	100%
Arts, entertainment, and recreation	217,813	269,300	(51,487)	81%
Accommodation and food services	715,841	806,948	(91,107)	89%
Agriculture, forestry, fishing and hunting	40,523	46,377	(5,854)	87%
Manufacturing	5,876,677	5,841,608	35,069	101%
Retail trade	4,287,386	1,449,244	2,838,142	296%
Transportation and warehousing	895,479	895,164	315	100%
Finance and insurance	3,653,019	1,398,928	2,254,091	261%
Other services (except public administration)	316,418	585,299	(268,881)	54%

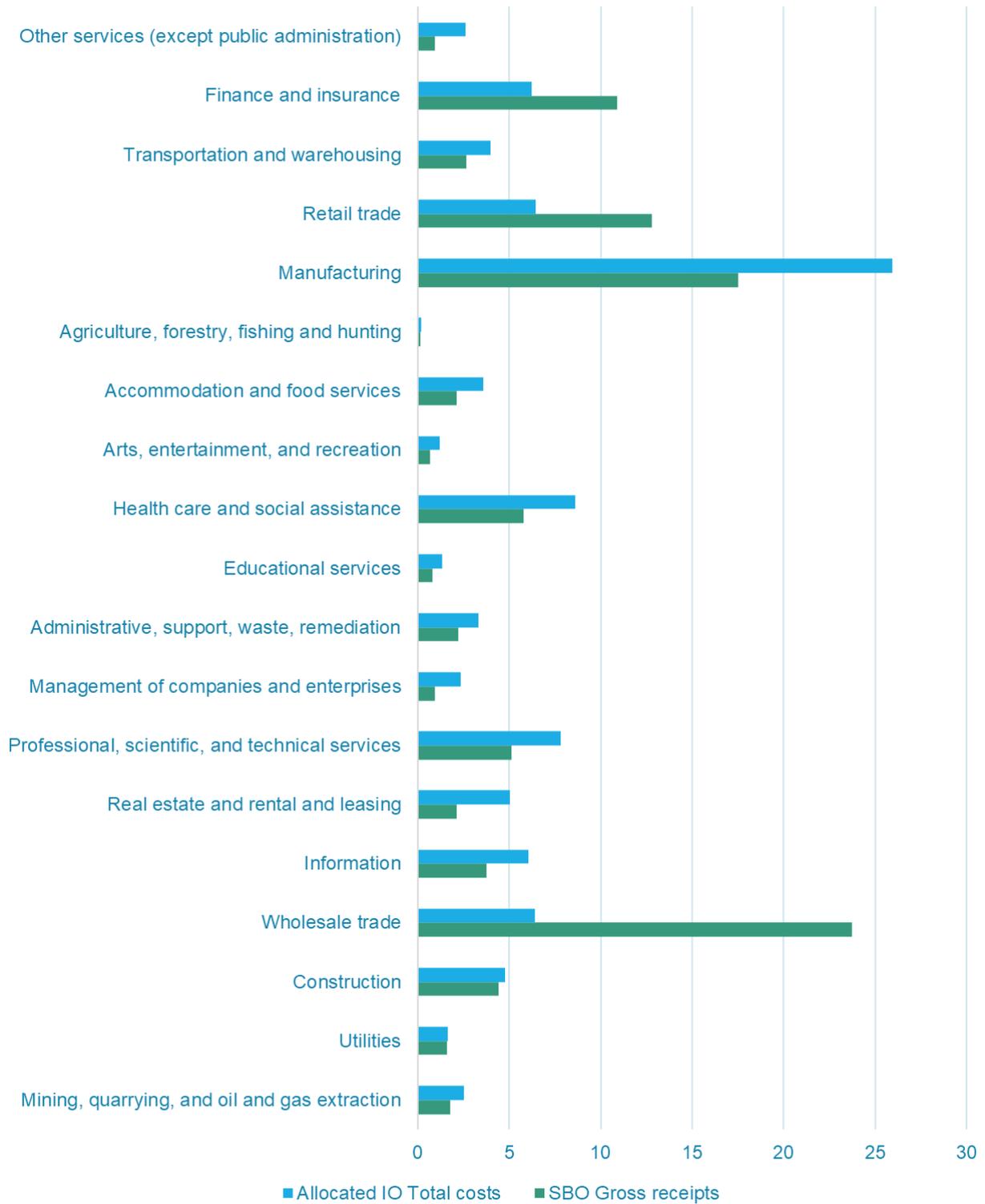
Sources: BEA Input-output accounts, Census SBO, authors' calculations

Table 9: Alignment Between SBO Payroll and BEA COE in U.S.\$ million, 2012

NAICS 2-digit sector	SBO Payroll	Allocated IO COE	Level Gap	Ratio SBO/IO
Total for all sectors	5,236,446	6,667,854	(1,431,408)	79%
Mining, quarrying, and oil and gas extraction	63,251	90,502	(27,251)	70%
Utilities	58,436	69,766	(11,330)	84%
Construction	275,826	366,610	(90,784)	75%
Wholesale trade	373,207	457,925	(84,718)	81%
Information	271,518	271,627	(109)	100%
Real estate and rental and leasing	86,404	98,957	(12,553)	87%
Professional, scientific, and technical services	589,687	776,207	(186,520)	76%
Management of companies and enterprises	315,656	259,102	56,554	122%
Administrative and support and waste management and remediation services	335,845	341,473	(5,628)	98%
Educational services	119,247	160,959	(41,712)	74%
Health care and social assistance	733,364	964,387	(231,023)	76%
Arts, entertainment, and recreation	62,064	86,195	(24,131)	72%
Accommodation and food services	194,336	282,765	(88,429)	69%
Agriculture, forestry, fishing and hunting	5,927	20,292	(14,365)	29%
Manufacturing	600,267	917,942	(317,675)	65%
Retail trade	368,204	510,646	(142,442)	72%
Transportation and warehousing	184,239	252,790	(68,551)	73%
Finance and insurance	528,395	487,792	40,603	108%
Other services (except public administration)	70,424	251,917	(181,493)	28%

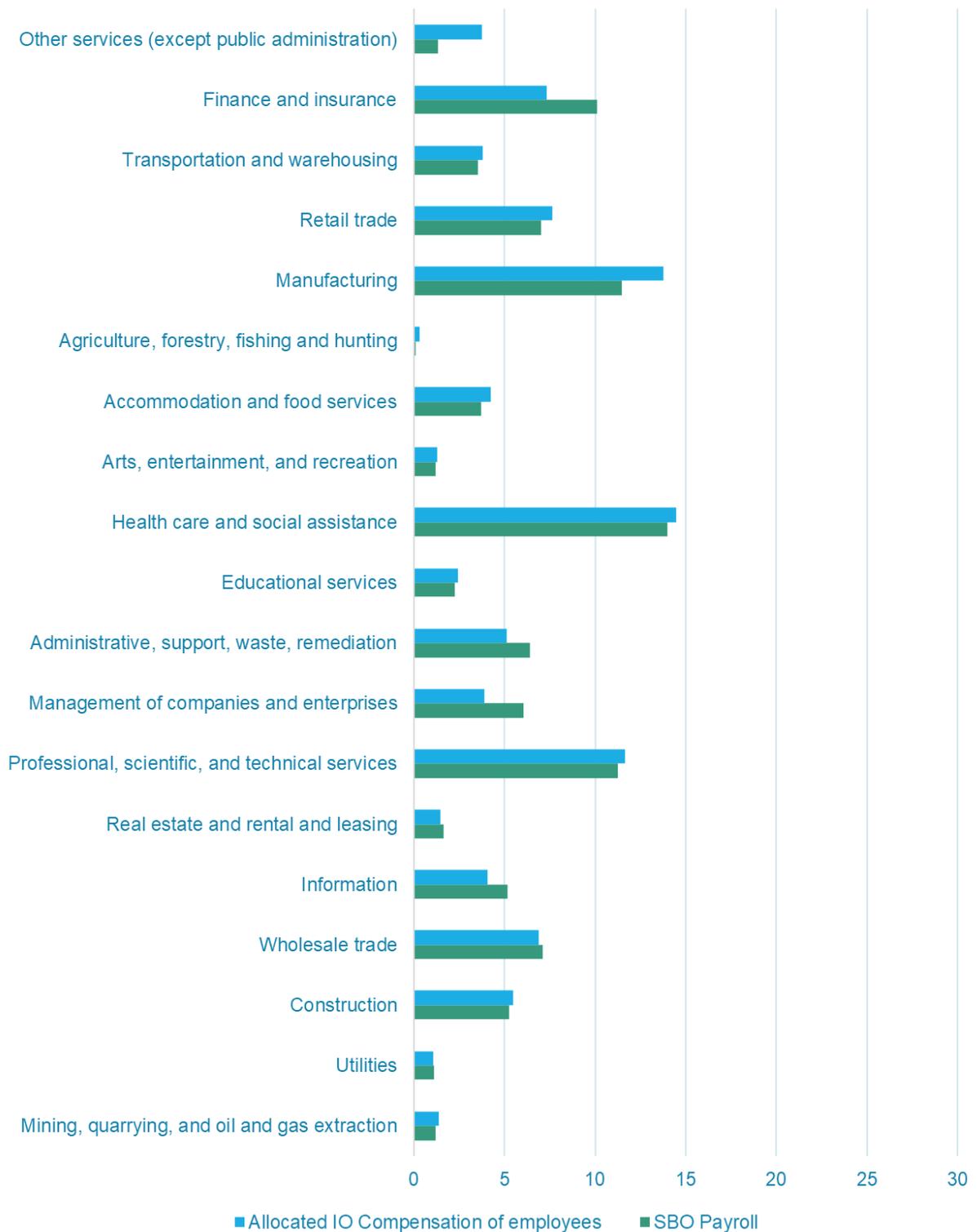
Sources: BEA Input-output accounts, Census SBO, authors' calculations

Figure 16: Poor Alignment between SBO Gross Receipts and BEA IO Total Costs Data



Source: Calculations from BEA Input-output accounts and Census SBO data on employer firms

Figure 17: Better Alignment Between SBO Payroll and BEA IO Compensation of Employees



Source: Calculations from BEA Input-output accounts and Census SBO data on employer firms

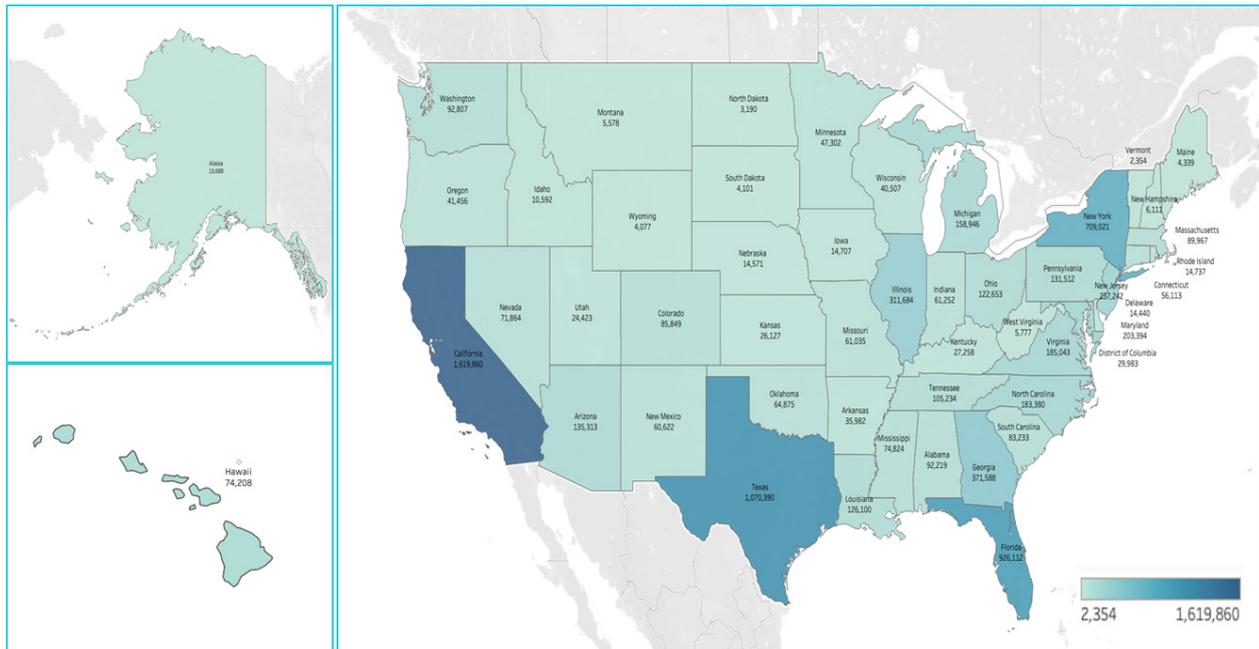
comprised 24.4 percent of total employer firm gross receipts in the SBO and was over 550 percent larger than the same sector in the BEA input-output database. By comparison, this sector’s SBO payroll was \$373 billion, or about 7.1 percent of total SBO payroll. These relativities between gross receipts and labor shares raise an immediate red flag. In the original 2012 input-output data, Wholesale Trade has a share in aggregate total costs of just over 5 percent and a share of labor compensation in total COE of 5.3 percent. In the adjusted BEA share data in Table 6, Wholesale Trade has a total cost share of 6.6 percent and a COE share of 6.9 percent in the adjusted aggregate data. The discrepancy is due to methodology. Trade margins like wholesale and retail trade are service sectors that link buyers and sellers, facilitating the sale of a product to a purchaser. As a direct result, they tend to have relatively low levels of value-added in gross receipts. For example, the value of a t-shirt purchased by a retailer from an upstream clothing manufacturer is included in the gross receipts data for the clothing store: however, the t-shirt represents the embodied value-added of previous levels of the supply chain and not of the store that finally sells it. This comparatively high intermediate cost share will be subsumed in raw survey data on gross receipts like that in the SBO, while

data that has been adjusted to better represent the activity of the sector, like the IO data, will not. The Retail Trade sector in Table 8 also reflects this, where the level of gross receipts for the SBO retail sector is close to three times the size of that reported in the input-output accounts. It is not a matter of one dataset being “right” and the other “wrong”, only that they are reporting different definitions of similarly named metrics.

Another likely candidate for adjustment is finance. For example, the value-added content of an insurance policy premium is challenging to identify, and a little controversial. Metrics like gross receipts are easy to define and measure, and subject to much less controversy. Raw value-added data from these sectors is normally adjusted before entering the national accounts.

For these reasons, the sectoral alignment summarized by the “Ratio SBO/IO” column in Table 8 is informative, but less than definitive. The impact of these definitional differences can be highlighted by replacing the Wholesale trade, Retail trade, and Finance and Insurance sector numbers in the SBO data with the sector values from the input-output accounts: the total of SBO gross receipts falls to \$21,927 billion, only 2.6 percent smaller than the BEA total costs aggregate figure, compared with being 48.9 percent larger before the substitution.

Figure 18. Minority-Owned Businesses by State, 2012 Data (%)



Source: Census SBO

Table 10: Sectoral Shares, Labor Compensation and Gross Receipts Data, percent of total, 2012

NAICS 2-digit sector	SBO Payroll	Allocated IO CoE	SBO Gross Receipts	Allocated IO Total
Total for all sectors	100%	100%	100%	100%
Mining, quarrying, and oil and gas extraction	1.21%	1.36%	1.77%	2.53%
Utilities	1.12%	1.05%	1.58%	1.63%
Construction	5.27%	5.50%	4.43%	4.75%
Wholesale trade	7.13%	6.87%	23.74%	6.41%
Information	5.19%	4.07%	3.74%	6.07%
Real estate and rental and leasing	1.65%	1.48%	2.14%	5.03%
Professional, scientific, and technical services	11.26%	11.64%	5.14%	7.83%
Management of companies and enterprises	6.03%	3.89%	0.92%	2.36%
Administrative and support and waste management and remediation services	6.41%	5.12%	2.21%	3.32%
Educational services	2.28%	2.41%	0.81%	1.33%
Health care and social assistance	14.01%	14.46%	5.80%	8.60%
Arts, entertainment, and recreation	1.19%	1.29%	0.65%	1.20%
Accommodation and food services	3.71%	4.24%	2.13%	3.58%
Agriculture, forestry, fishing and hunting	0.11%	0.30%	0.12%	0.21%
Manufacturing	11.46%	13.77%	17.52%	25.94%
Retail trade	7.03%	7.66%	12.78%	6.44%
Transportation and warehousing	3.52%	3.79%	2.67%	3.98%
Finance and insurance	10.09%	7.32%	10.89%	6.21%
Other services (except public administration)	1.34%	3.78%	0.94%	2.60%

Sources: BEA Input-output accounts, Census SBO, authors' calculations



The most critical component of the “Ratio SBO/IO” column in Table 8 is the variability of the individual sectoral ratios away from the total average. The evident variability implies that gross receipts numbers for most of these sectors are not a good indicator of the relative size of the sector in the aggregate. Comparatively, the same is true for the payroll and COE data, but with significantly smaller variation between data sets, as reported in Table 9 below. For example, note that most of the ratios in the labor compensation table are in the ballpark of the average of 79 percent, and outliers like “Agriculture, forestry, fishing, and hunting” are explainable by things like “out of scope” omissions discussed earlier.

Figures 16 and 17 plot the column shares of SBO and BEA data together for each sector, and Table 10 provides the underlying data. The point of this assessment is to find a “best available candidate” to provide a means to allocate the remapped BEA input-output data to ownership subgroups in a sensible and defensible way, i.e., one that is reliably informative. It is clear from these charts that the fit between the two sources of labor compensation data—as reported in Figure

17—provides a better alignment between SBO and BEA statistics.

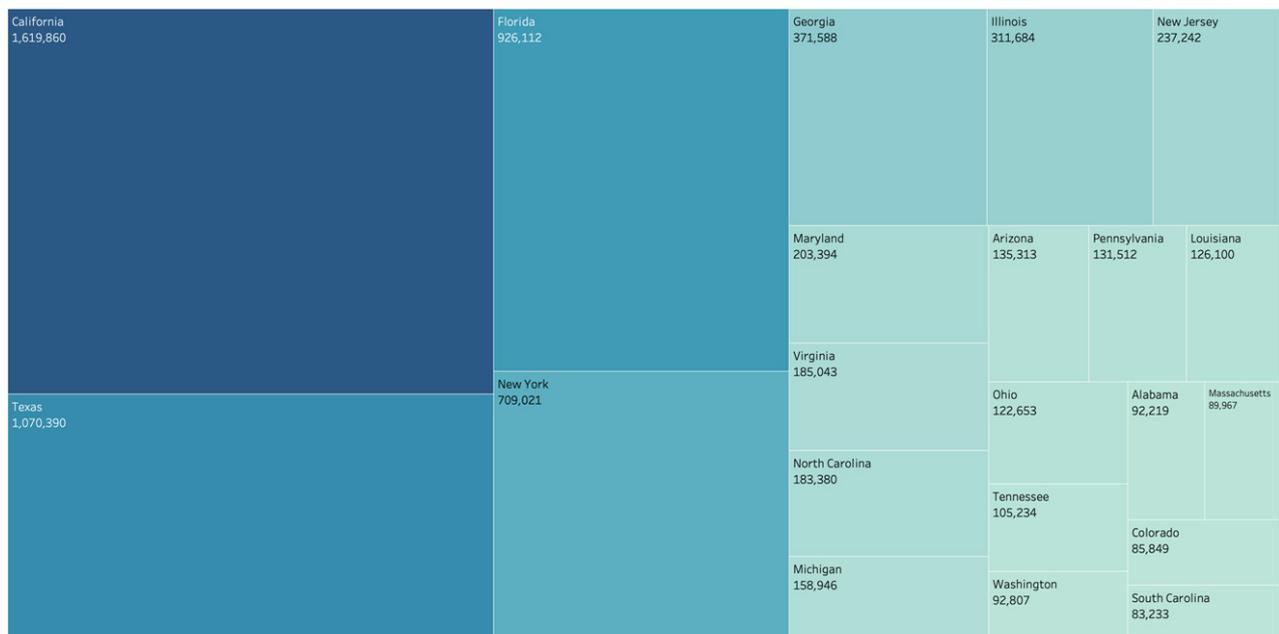
Linking the SBO and BEA Datasets through Payroll Data

The SBO provides payroll numbers for each 20-sector industry and each ownership cohort classification, providing some basis for calculating the share of each industry/ownership classification pair in total SBO payroll. With only this data to inform the allocation, these sectoral shares are used to allocate the BEA sectoral data for compensation of employees across each racial ownership cohort.

Next, the relationships between the BEA COE data and the other cost data—i.e., intermediate inputs, taxes on production less subsidies, and gross operating surplus—are calculated as ratios within a given sector in the original data. These ratios are then used to allocate data for the other cost factors to each industry.

In essence, each value in the column containing COE data in Table 9 is split across

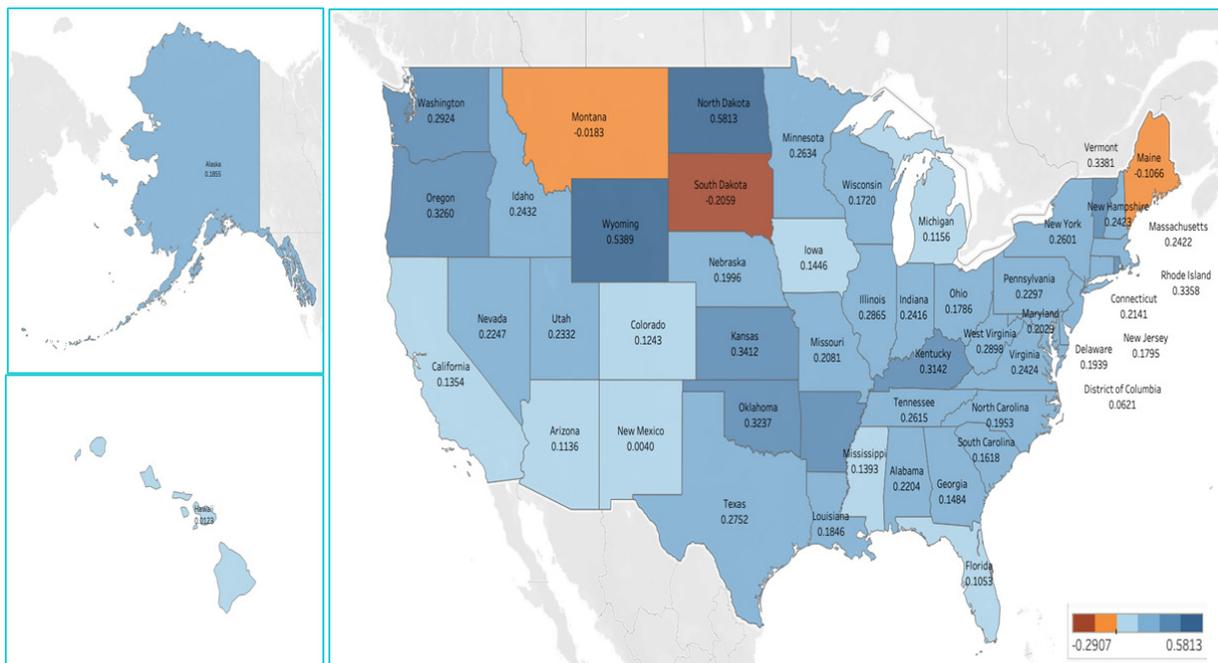
Figure 19. Top States by Total Minority-Owned Businesses, 2012



Source: Census SBO, authors’ calculations

Data note: States with total MBE firms under 80,000 are excluded from the tree map.

Figure 20. Where MBEs are Growing: Growth in Total Employer MBEs by State, 2007 to 2012



Source: Census SBO, authors' calculations

ownership classifications according to the column shares of SBO payroll data in Table 6. Then, a ratio for each non-labor cost factor (total intermediate, taxes on production and imports less subsidies, and gross operating surplus) with respect to the calculated COE figures in Table 9 is estimated from IO data and used to generate values for these factors in each sector for each ownership subgroup.

The compositional differences within each class compared to the aggregate result in the overall sum for each cost metric diverging from the original BEA total after this allocation - except for the COE total, of course, being used as the benchmark. Fortunately, due to the reasonably good alignment between the SBO payroll and BEA COE data, the errors are remarkably small: for the 2012 data; 3.14 percent for intermediate inputs, 1.1 percent for taxes, and -0.08 percent for gross operating surplus, all leading to errors of 1.5 percent in total costs and 0.05 percent in GDP, the latter being smaller because it omits the relatively large error in intermediate inputs.

The final step is then to scale the values in these columns to remove the error in the column sum. For example, in the case of intermediate inputs, the column of calculated intermediate input values for the ownership subgroups is scaled by a multiplier of 1.0314

(i.e., increased by 3.14 percent) to hit the original BEA total while maintaining the relativities within the subgroups.

To be clear, at this point such a scaling is only driven by numerical balance, but it provides a useful starting point. The resulting ownership subgroup data provides a sense of cost structures for sectors within ownership classes. The allocation method used was simplistic by necessity because the information available to make the allocations was sparse: only a one-dimensional scaling factor was available, based on relative SBO payroll values for each ownership subgroup (providing column shares), where a total of four column scaling factors would have been ideal.

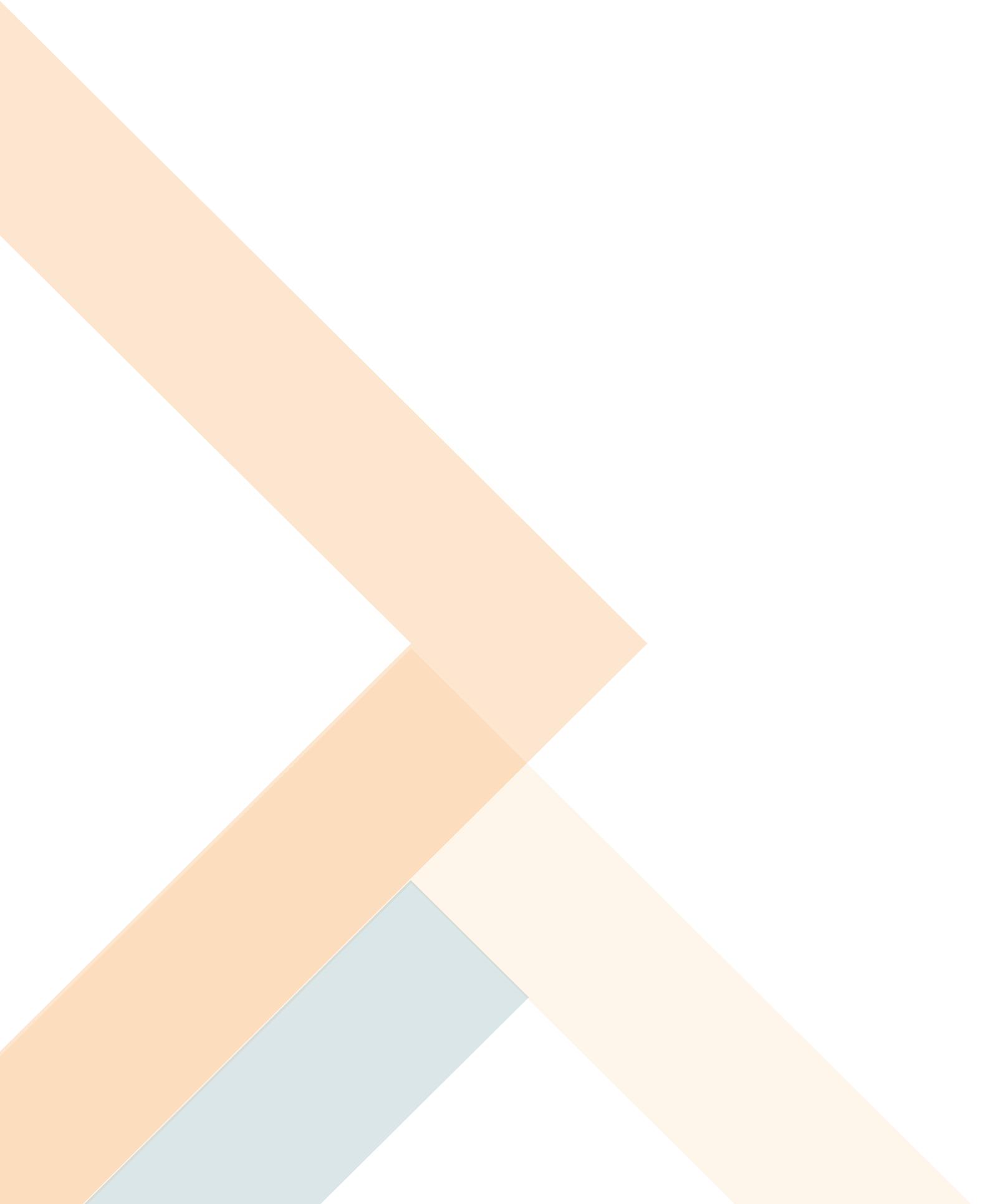
Substituting for the missing three scaling factors with the row shares in the aggregate data requires the assumption that relativities between cost factors evident in aggregate sectoral data are passed down to sectors within ownership groups.

What Do the Estimates Reveal?

Table 11 provides a high-level view of the results for 2012. In 2012, the 908,800 employer MBEs surveyed in the SBO

contributed \$449.3 billion in value-added to the American economy, which accounted for 2.8 percent of 2012 U.S. GDP. Among minority subgroups, Asian firms with paid employees generated \$225.9 billion in value-added, around half of the employer MBE contribution to GDP. By comparison, non-MBEs with paid employees (totaling 5.1 million employer firms) contributed \$4,155.1 billion in value-added in 2012, or around 25.7 percent of GDP.





MBEs in the Economy: National and State Level Picture

Number of Employer MBEs

The growth rate in the number of employer MBEs has been consistently higher than that of nonminority firms. This phenomenon can largely be explained in the growth rate of the minority population; however, MBEs are still underrepresented in the pool of employer firms.

The total number of classifiable employer firms has declined from 2002 to 2015. Non-MBE employer firms declined by 0.65 percent while the number of employer MBEs grew at an average annual rate of 3.59 percent.²⁷ Population growth plays a key role driving these numbers. Between 2007 and 2012, the U.S. working-age population increased at an average annual growth rate of 1.08 percent, with the nonminority population growing at 0.23 percent and the minority population at 2.85 percent. Accounting for these population growth dynamics, employer MBEs grew at a population-adjusted average annual rate of 0.60 percent.²⁸ Thus, minority population growth seems to account for approximately four-fifths of the total growth in employer MBE numbers between 2007 and 2012. The IGM projects these elements and the role of population growth in MBE value-added into the future.

The number of employer firms increased in all minority groups between 2007 and 2012. Asian-owned firms had the highest average annual rate of growth in employer firm numbers (4.1 percent), followed by Native Hawaiian and Other Pacific Islander (3.0 percent), Hispanic (2.9 percent), African American (2.1 percent), and American Indian and Alaska Native firms.

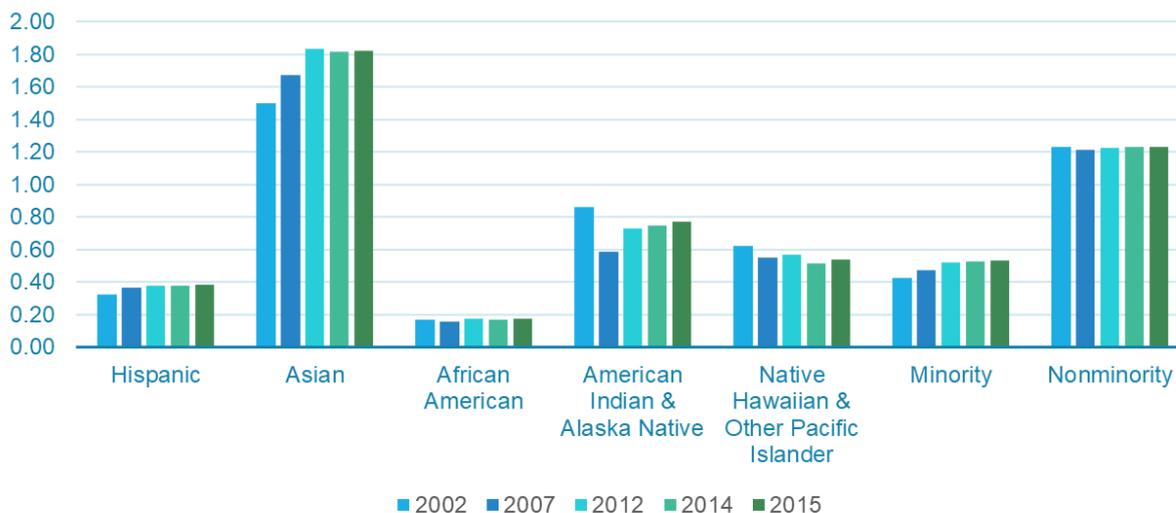
In 2012, the top five states for the number of employer MBEs were California, Texas, Florida, New York, and Georgia. This is largely due to the states' relatively large minority populations. Each of these states also grew in terms of the number of employer MBEs between 10.53 percent in Florida and 27.52 percent in Texas.

Between 2007 and 2012 SBO years, the top five states for MBE growth were North Dakota (58.13 percent), Wyoming (53.89 percent), Arkansas (36.82 percent), Kansas (34.12 percent), and Vermont (33.81 percent). South Dakota (-20.59 percent), Maine (-10.66 percent), and Montana (-1.83 percent) were the only states to have negative growth between 2007 and 2012 in terms of the number of employer MBEs.

MBEs and non-MBEs have not just grown in different sectors and in different ways, but in different places, too. The top five states for employer non-MBEs look similar to MBEs: California, New York, Florida, Texas, and Illinois (New Jersey is ranked 8th). On the other hand, employer non-MBEs are growing the fastest in North Dakota (13.73 percent), the District of Columbia (4.00 percent), South Dakota (2.84 percent), Nebraska (2.40 percent), and Wyoming (2.01 percent). Non-MBEs are falling the fastest in Idaho (-11.32 percent), West Virginia (-9.98 percent), Alabama (-9.83



Figure 21. Share of Employer Firms Relative to Adult Population Share, 2002, 2007, 2012, 2014 and 2015



Source: Census SBO

percent), Arizona (-8.83 percent), and Georgia (-8.42 percent). Forty-one out of 51 states had negative growth for non-MBEs between 2007 and 2012.

These state-level comparisons also reveal a fundamental issue with using SBO data between the 2007 and 2012 years. When the 2007-08 recession came along after a period of steady growth, unemployment increased. What also increased; however, was the number of self-employed individuals—people who would work in freelance or selling a product before going back to their old jobs. These are categorized as non-employer firms, and they grew between the 2007 and 2012 SBO years.

In all but 4 states,²⁹ non-employer MBE growth exceeded employer MBE growth. In Iowa, the growth in total firms between 2007 and 2012 was 80.92 percent, compared to 14.46 percent growth in employer firms, a gap of 66.45 percentage points. Four other states exceeded a 40 percentage-point (ppt) gap: South Dakota (62.89 ppt), Arizona (47.41 ppt), Mississippi (45.98 ppt), and Nebraska (45.36 ppt).

This phenomenon is not nearly as drastic for non-MBEs. The percentage-point gap for non-MBEs peaked at 7.53 percentage points in Idaho, and in 22 states, growth in employer firms exceeded that of total firms for non-MBEs between 2007 and 2012.

Relative to the adult population share, minority groups tend to have a less-than proportional

representation in employer firms.³⁰ While the ratio of employer MBEs to the minority population did grow between 2002 and 2015 from 0.43 to 0.53, these numbers indicate that the number of employer MBEs would need to almost double to catch up and be proportional to the minority population. Non-MBEs proportional to the population stayed static during this same period, at 1.23 in both 2002 and 2015. The Asian MBE sub-group is the only minority group to be over-represented relative to their population; in 2012, the ratio of Asian-owned MBEs to the Asian population was 1.84. In the same year, the ratio for other groups was:

- Hispanic: 0.38
- African American: 0.17
- American Indian & Alaska Native: 0.73
- Native Hawaiian & Other Pacific Islander: 0.57

Table 11: Calculated Components of Value-Added for Employer MBEs, U.S.\$ Billion, 2012

	Total Interme- diate	COE	Taxes on Pro- duction and Imports, less subsidies	GOS	Total Value- Added	Total Costs
All Employer MBEs	353.4	279.2	35.4	134.7	449.3	802.7
Hispanic	118.4	90.2	11.0	45.5	146.7	265.1
African American	37.9	34.1	2.9	14.2	51.2	89.1
Asian	176.8	139.4	19.8	66.7	225.9	402.7
AIAN	11.3	8.5	0.9	4.7	14.1	25.4
NHOPI	2.0	1.5	0.2	0.8	2.5	4.5
Nonminority Employ- er Firms	3,662.6	2,390.2	312.2	1,452.7	4,155.1	7,817.7

Sources: BEA Input-output accounts, Census SBO, authors' calculations

Table 12: Number of Classifiable Employer Firms, Minority and Non-Minority, 2002, 2007, 2012, 2014, and 2015

	2002	2007	2012	2014	2015
Minority	629,831	766,533	908,800	949,318	996,248
Hispanic	199,542	248,852	287,501	298,563	312,738
Asian	319,468	389,580	476,510	502,479	526,863
African American	94,518	94,416	104,876	102,664	108,007
American Indian & Alaska Native	24,498	23,662	26,179	26,757	27,585
Native Hawaiian & Other Pacific Islander	3,693	3,778	4,385	4,052	4,086
Nonminority	4,542,233	4,423,435	4,227,404	4,141,816	4,172,714

Source: Census SBO



MBE Industries

The SBO data show that employer MBEs and non-MBEs are concentrated in different industries. The industry concentration accounts for most of the variation in gross operating surplus and gross receipts between MBEs and non-MBEs but does not fully explain why those receipts are lower in employer MBEs compared to nonminority firms.

Industry concentration explains some, but not all, of the variance in the size, profitability, number of employees, occupational mix, and average labor compensation paid by employer MBEs relative to non-MBEs.

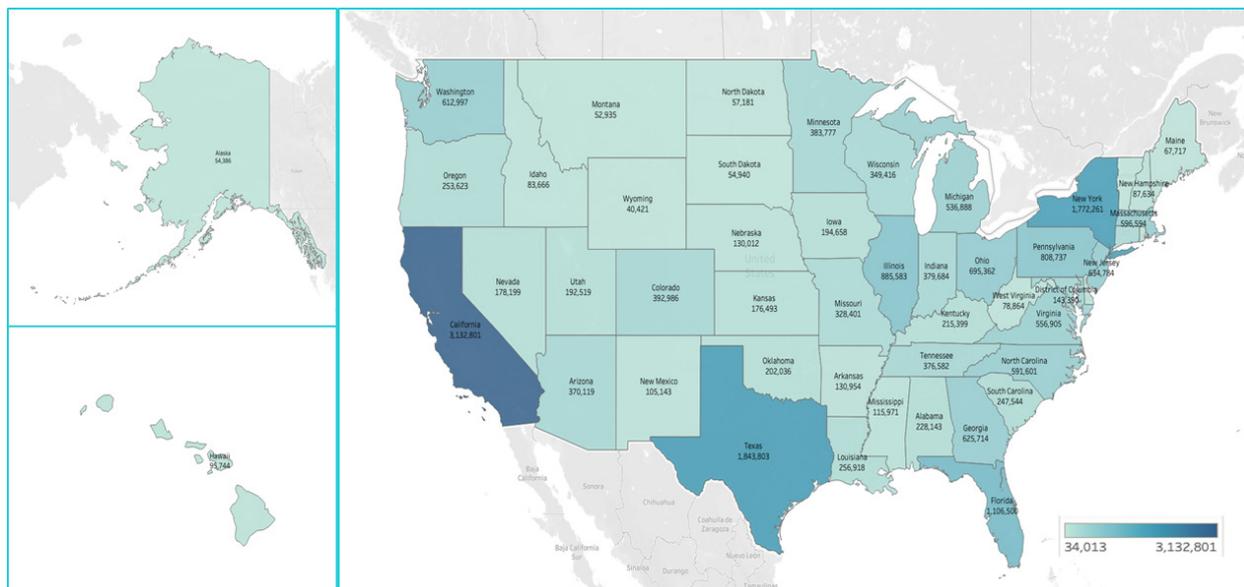
Capital-labor ratios or capital intensities³¹ vary across industry sectors and over time. Industries are differentiated by the products they produce and, by implication, the technology and production techniques they employ. Different production techniques and technologies require different types and amounts of capital and labor, leading to varying income profiles. For example, industries such as Utilities and Mining are relatively capital-intensive because they apply relatively large amounts of heavy machinery

and equipment in production. Other industries are more labor intensive, with a production based primarily on skilled labor, such as Health Care and Social Assistance. It follows that capital-intensive industries generally report a higher GOS share in total costs, while labor-intensive sectors generally report a higher labor share in costs. In addition, different industry technologies require workers with different skills that attract different levels of compensation.

The top six industries for MBEs with paid employees are Accommodation and Food Services (18.0 percent of total MBEs), Retail Trade (15.2 percent), Health Care and Social Assistance (15.0 percent), Professional, Scientific, and Technical Services (10.8 percent), Other Services (8.7 percent), and Construction (6.8 percent).³²

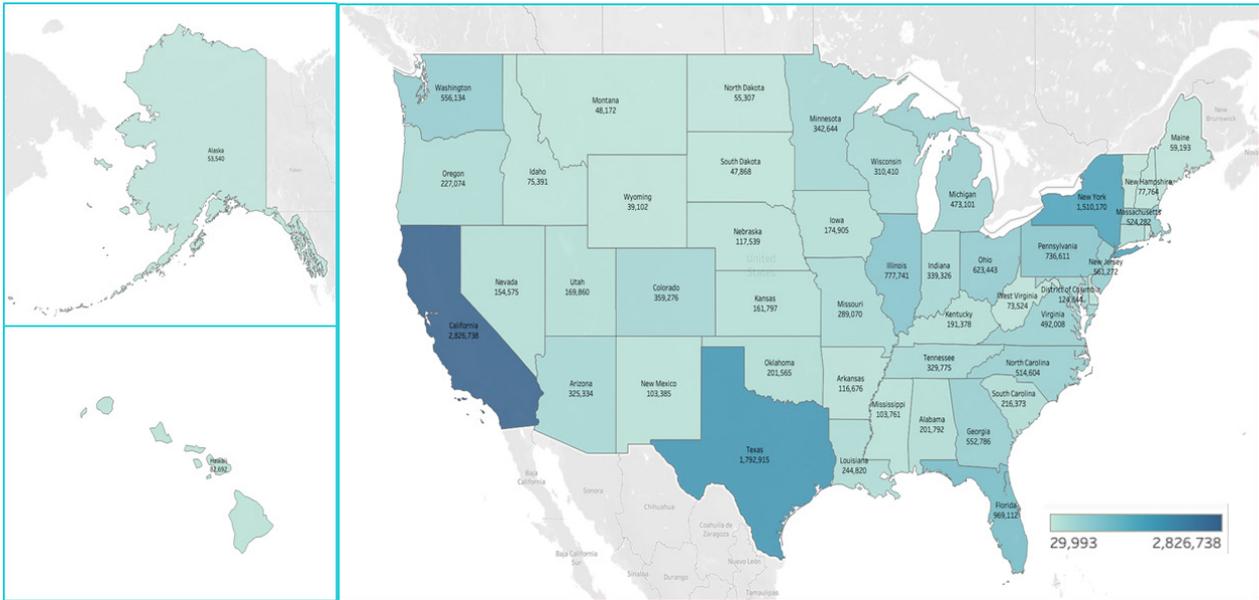
Among minority groups, African American employer MBEs show the greatest differences in industry composition compared to non-MBEs, followed by Asian, Native Hawaiian and Other Pacific Islander, American Indian and Alaska Native, and Hispanic-owned employer MBEs. The largest industry shares for each racial cohort are:

Figure 22. Nominal GDP by State, Millions of US\$, 2019



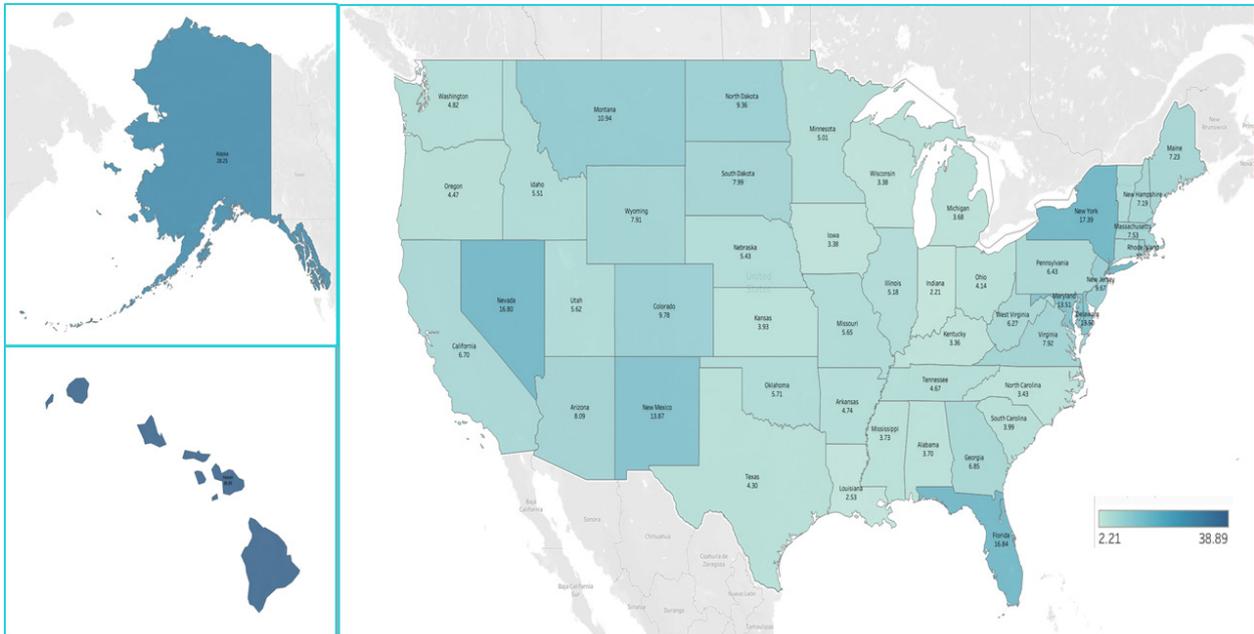
Source: BEA, authors' calculations

Figure 23. Real GDP by State, Millions of US\$, 2019



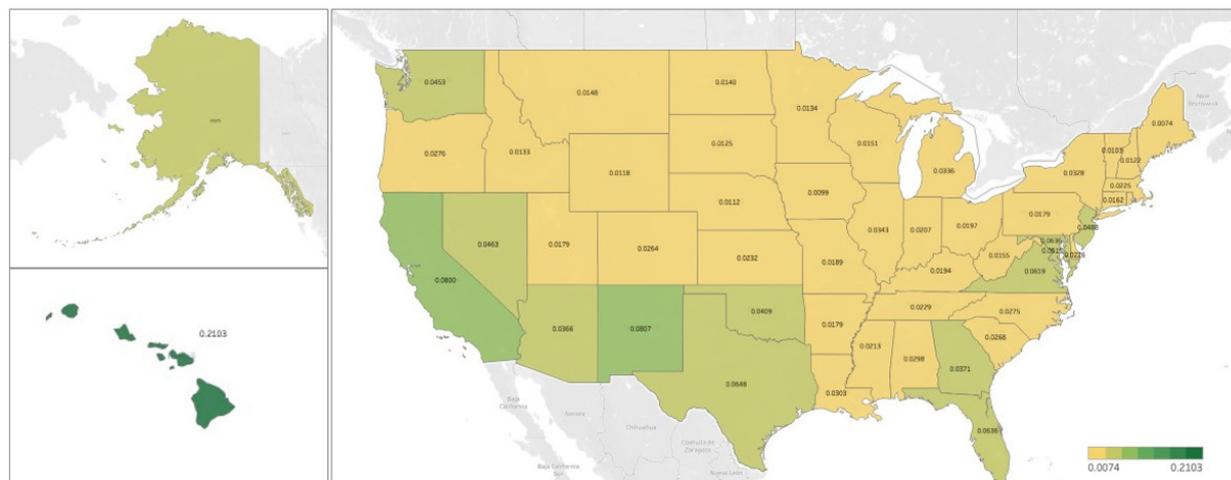
Source: BEA, authors' calculations

Figure 24. Services-to-Manufacturing Ratio by State, 2012



Source: BEA, authors' calculations

Figure 25. Ratio of MBE Payroll to All Firm Payroll, 2012



Source: Census SBO, authors' calculations

- African American: Health Care and Social Assistance (29.9 percent) and Professional, Scientific, and Technical Services (12.6 percent);
- Asian: Accommodation and Food Services (24.1 percent), and Retail Trade (19.3 percent);
- Native Hawaiian and Other Pacific Islander: Construction (16.1 percent), and Professional, Scientific, and Technical Services (12.8 percent);
- American Indian and Alaska Native: Construction (18.8 percent), and Professional, Scientific, and Technical Services (13.8 percent);
- Hispanic: Construction (13.5 percent) and Accommodation and Food Services (13.2 percent).

State-level value-added estimates largely reflect their respective populations; however, the industries from which that value-added is drawn vary widely from state-to-state. For instance, in the Nursing and Residential Care Facilities industry (a sub-section of Health Care and Social Assistance) the share of value-added from state-to-state ranges from 0.345 in the District of Columbia to 1.27 percent in Connecticut. The (non-government/mining/farms) industries with the largest variation in state-to-state shares of value-added are Accommodation (10.93 percent in Nevada and 0.28 percent in Delaware), Real Estate (17.73 percent in Hawaii and 7.09 percent in North Dakota), and Insurance Carriers and Related

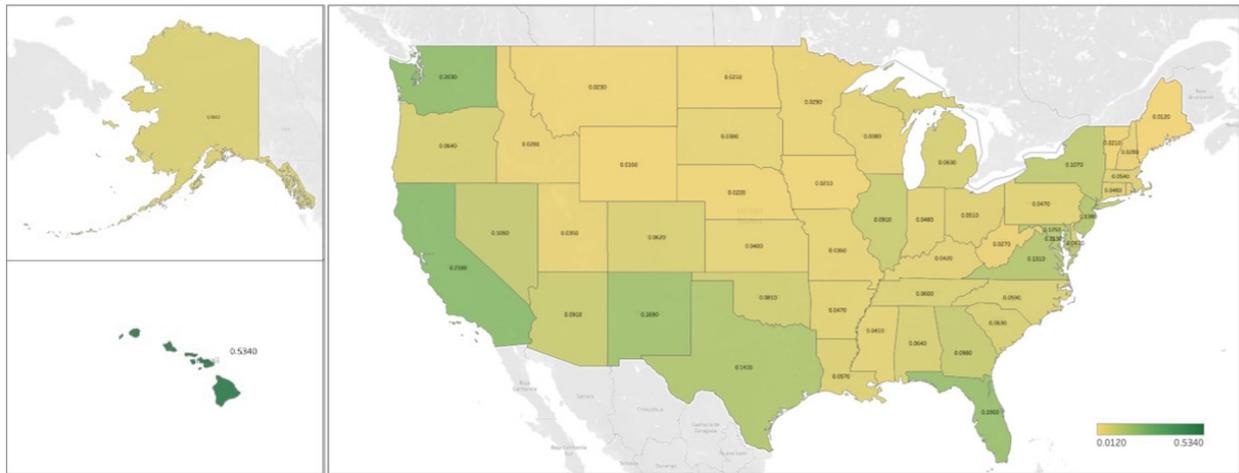
Activities (9.85 percent in Delaware and 0.583 percent in Alaska).

MBEs tend to be concentrated in industries with a high labor to capital ratio and in services industries. States with a higher ratio of services to manufacturing are likely to have a higher than average value-added by MBEs because of those sectors. Excluding the District of Columbia³³ the ratio of the share of GDP in services sectors over the share of GDP in manufacturing sectors varies. The ratio ranges from 2.21 to 1 in Indiana to 38.89 to 1 in Hawaii. Fourteen states have an above average service-to-manufacturing ratio: Hawaii, Alaska, New York, Florida, Nevada, New Mexico, Maryland, Delaware, Montana, Rhode Island, Colorado, New Jersey, North Dakota, and Arizona.³⁴

Compared to the top states for number of MBEs, three of the top five states (NY, FL, NJ) have above average services-manufacturing ratios, and one additional state (CA) is above the median. This is to be expected; the industries, population, and value-added are all aligned in these states. However, the states where MBEs are growing the fastest are not represented on this list: only ND is in the top five for MBE growth and has an above average services to manufacturing ratio. One additional state (WY) is above the median for services-manufacturing. This could be due to the relatively small minority population in these states, even though MBEs are growing.

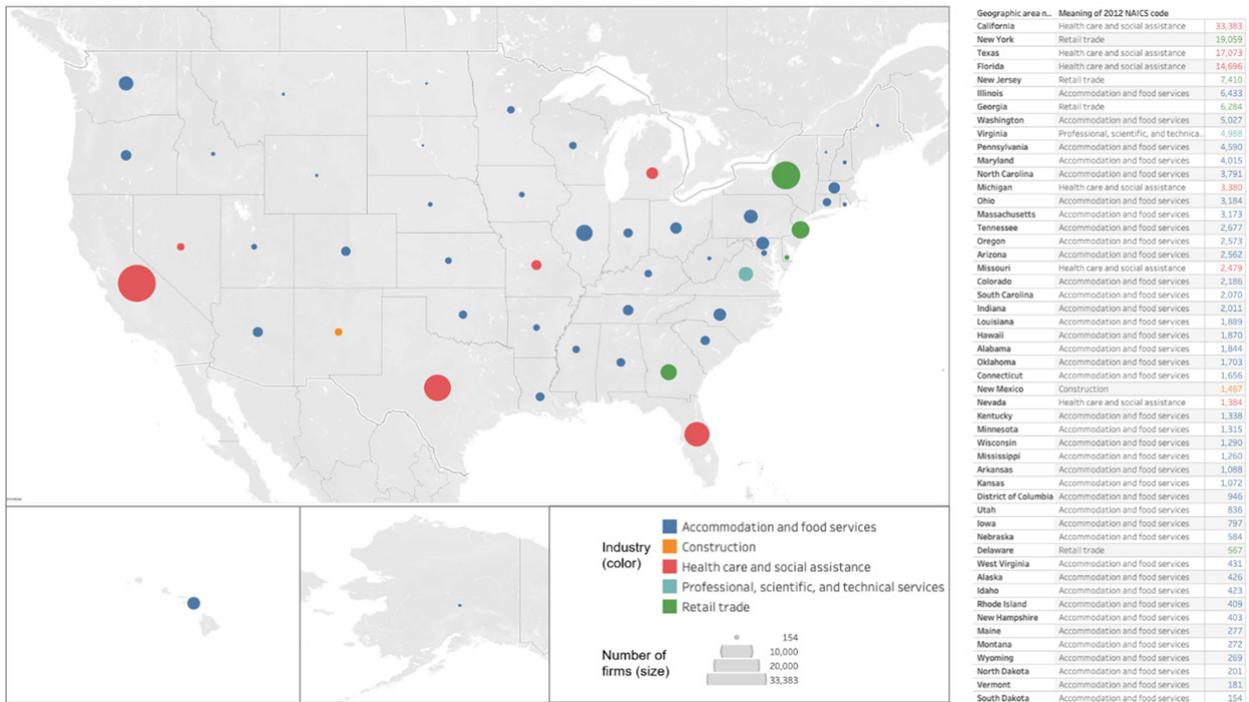
The same trends can be found in the state-level SBO data on payroll and gross

Figure 26. Ratio of MBE Gross Receipts to All Firm Gross Receipts, 2012



Source: Census SBO, authors' calculations

Figure 27. Top MBE Sector for Each State by Number of Firms, 2012



Source: Census SBO, authors' calculations

receipts: the total value of the payroll and gross receipts aligns with the size of the minority population, but the shares are much more reflective of industry concentration.

The top state and industry for MBE annual payroll is Health Care and Social Assistance in California. California makes up seven of the top ten state-industries for payroll. Health Care and Social Assistance in California is followed by Professional, Scientific, and Technical Services, Wholesale Trade, Accommodation and Food Services, Manufacturing, Retail Trade, and Administrative Support Services. Also included in the top ten state-industries for payroll are Texas (Health Care and Social Assistance), Virginia (Professional, Scientific, and Technical Services), and Florida (Health Care and Social Assistance).

As a percentage of the total within each state, MBE payroll concentration is much more varied. In Virginia, Professional, Scientific, and Technical Services makes up 45.66 percent of total payroll. Professional, Scientific, and Technical Services makes up five of the top ten states in payroll concentration, including Vermont, Maryland, the District of Columbia, and New Jersey. Accommodation and Food

Services makes up three of the top ten states for MBE payroll in Maine, Wyoming, and Mississippi. Also included in the top ten state-industries for payroll concentration are West Virginia Health Care and Social Assistance and South Dakota Retail Trade.

MBE gross receipts; however, reflect the difference in labor intensive industries versus capital-intensive industries. California makes up five of the top ten states for employer firm gross receipts in the Wholesale Trade, Retail Trade, Manufacturing, Accommodation and Food Services, and Health Care and Social Assistance industries. Wholesale Trade in Florida, Texas, and New York and Retail Trade in Washington in Texas make up the rest of the top ten.

In terms of share gross receipts by state, the top industries are Retail Trade, Wholesale Trade, and Accommodation and Food Services. The states are more spread out in Washington, South Dakota, New Jersey, South Carolina, Vermont, Wyoming, Nevada, Florida, and Maine. The top state-industry share in gross receipts is Retail Trade in Washington at 66.47 percent.

Figure 28. Industry Breakdown of the Fastest Growing MBE States by Gross Receipts, US\$, 2012

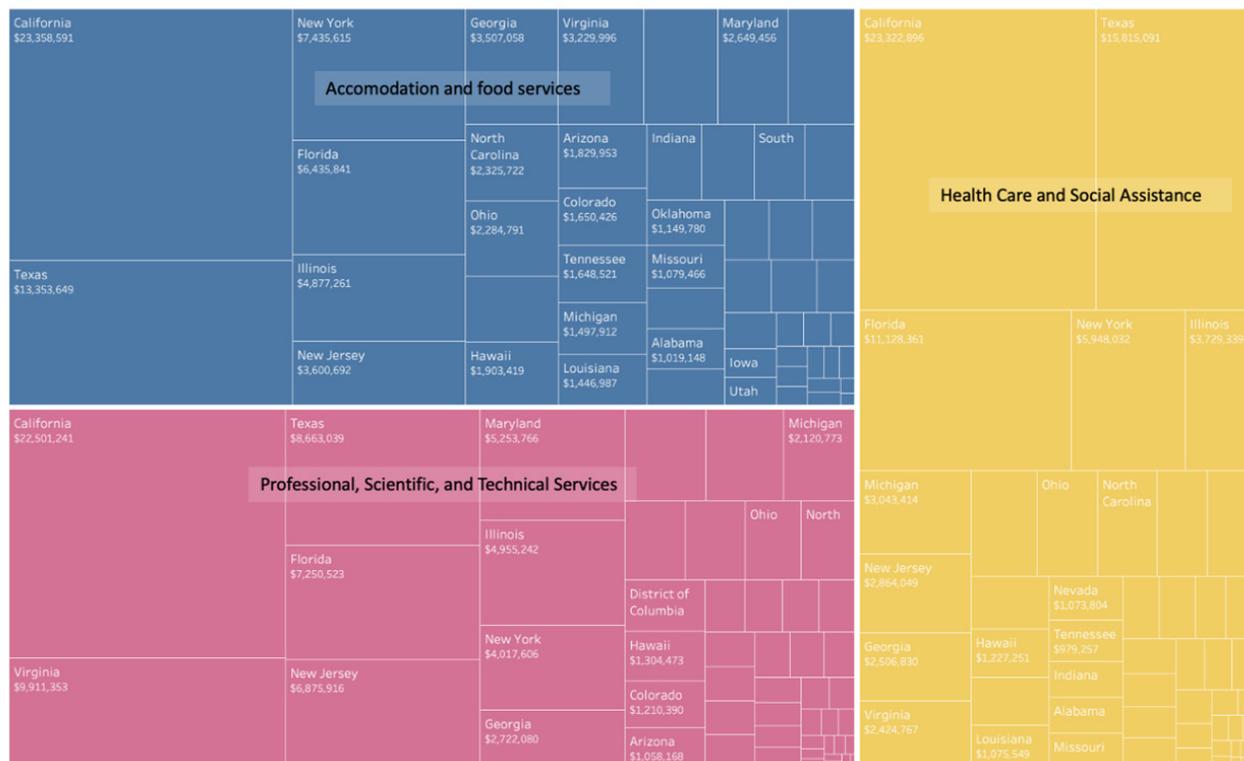


Source: Census SBO, authors' calculations

In states where MBEs have the largest share of total employer firms, the top industries by number of employer firms are Accommodation and Food Services (in the first 16 states) and Health Care and Social Assistance. In states where MBEs are growing the fastest, the top industries (by share of payroll and gross receipts within the states) are:³⁵

1. North Dakota
 - a. Payroll: Accommodation and Food Services (16.16 percent), Transportation and Warehousing (15.18 percent), and Professional, Scientific, and Technical Services (12.93 percent)
 - b. Gross Receipts: Accommodation and Food Services (14.58 percent), Transportation and Warehousing (12.90 percent), and Wholesale Trade (11.79 percent)
2. Wyoming
 - a. Payroll: Accommodation and Food Services (37.34 percent), Construction (19.32 percent), Health Care and Social Assistance (9.19 percent)
 - b. Gross Receipts: Accommodation and Food Services (36.62 percent), Construction (18.00 percent), and Retail Trade (10.58 percent)
3. Arkansas
 - a. Payroll: Accommodation and Food Services (23.8 percent), Construction (14.48 percent), and Manufacturing (13.8 percent)
 - b. Gross Receipts: Wholesale Trade (19.66 percent), Manufacturing (19.25 percent), and Retail Trade (16.95 percent)
4. Kansas
 - a. Payroll: Health Care and Social Assistance (20.70 percent), Accommodation and Food Services (15.97 percent), and Construction (14.96 percent)
 - b. Gross Receipts: Wholesale Trade (17.15 percent), Retail Trade (15.98 percent), and Accommodation and Food Services (14.64 percent)
5. Vermont
 - a. Payroll: Professional, Scientific, and Technical Services (37.33 percent), Wholesale Trade (21.85 percent), and Accommodation and Food Services (15.01 percent)
 - b. Gross Receipts: Wholesale Trade (38.67 percent), Professional, Scientific, and Technical Services (11.93 percent), and Accommodation and Food Services (10.51 percent)

Figure 29. Gross Receipts of Key MBE Value-added Industries by State, US\$, 2012



Source: Census SBO, authors' calculations

Table 13: Sectoral Distribution of MBEs and Non-MBEs, 2012 (%) (share of firms)

NAICS 2-digit sector	Hispanic	Asian (non-Hispanic)	African American (non-Hispanic)	American Indian & Alaska Na- tive (non- Hispanic)	Native Hawaiian & Other Pacific Is- lander (non- Hispanic)	Total Minor- ity	Non-minority
Accommodation & Food Services	13.2	24.1	6.4	5.4	9.1	18	7.4
Administrative Support & Waste Management	8.8	2.2	9.8	7.7	6	5.4	6.3
Agriculture, Forestry, Fishing & Hunting	0.2	0	0.1	1	0	0.1	0.4
Arts, Entertainment, & Recreation	0.8	0.5	1.8	1.1	3.8	0.8	1.9
Construction	13.5	2.2	6.9	18.8	16.1	6.8	13.6
Educational Services	0.7	1.1	1.5	1	1.9	1	1
Finance and Insurance	3	1.6	3.9	4.9	2.4	2.4	4.5
Health Care & Social Assistance	10.5	14.5	29.9	11	11.8	15	9.9
Information	0.8	0.7	0.9	1	1.1	0.8	1.3
Manufacturing	3.6	2.5	1.2	4.4	5	2.8	5.1
Mining	0.2	0	0	1.2	0.5	0.1	0.4
Other Services (except Public Administration)	8.1	9.6	6.9	7.3	7.6	8.7	6.6
Professional, Scientific & Technical Services	10.3	10.6	12.6	13.8	12.8	10.8	15.3
Real Estate, Rental & Leasing	3.5	2.5	2.7	3.6	3.7	2.9	5.3
Retail Trade	11.5	19.3	7.3	10.1	10.3	15.2	11.7
Transportation & Warehousing	5.3	1.4	5.9	3.6	4.6	3.3	3.1
Utilities	0	0	0	0.1	0	0	0.1
Wholesale Trade	5.9	7.1	2.1	4	3.1	6	5.7

Source: Census SBO, authors' calculations



Value-added Across Industries

The aggregate value-added contribution of MBEs in 2012 across industry sectors was concentrated in Professional, Scientific, and Technical Services (15.1 percent of all MBE value-added), Health Care and Social Assistance (12.9 percent), and Accommodation and Food Services (12.0 percent).

The SBO data show that employer MBEs and non-MBEs are concentrated in different industries. MBEs are more labor intensive on average, with payroll shares in gross receipts of 19.1 percent in 2007 and 18.8 percent in 2012, compared to 16.6 percent in 2007 and 16.1 percent in 2012 for all firms. This is also true for employer nonminority firms, with labor shares in costs of 19.4 percent in 2007 and 19.1 percent in 2012. Publicly held firms explain the lower aggregate shares, with labor shares in costs in 2007 and 2012 of 15.1 percent and 14.6 percent, respectively.

MBE gross operating surplus is more concentrated in Professional, Scientific, and Technical Services (13.7 percent of all MBE GOS), Manufacturing (13.4 percent), Wholesale Trade (11.7 percent), and Accommodation and Food Services (8.7 percent). For non-MBEs, gross operating surplus is particularly large in Manufacturing (20.0 percent of all non-MBE GOS) and Real Estate and Rental and Leasing (11.7 percent). This is not to say, though, that MBEs have a larger share of all GOS produced in the sectors minority firms are more concentrated. For instance, the lead source of MBE GOS in 2012 comes from Professional, Scientific, and Technical Services, but in absolute dollar value, this MBE sector produced \$18.4 billion (out of the total \$134.7 billion GOS produced by minority firms), whereas non-MBE GOS for this same sector was \$117.2 billion (out of the total \$1,452.7 billion GOS produced by nonminority firms).

MBE compensation of employees are led by the Health Care and Social Assistance industry sector (17.4 percent out of all MBE compensation of employees), despite the same sector having a much lower share of MBE gross operating surplus, at 6.0 percent of all MBE gross operating surplus. This is an indication of the labor-intensive feature of the Health Care and Social Assistance industry sector.

For minority firms, value added in 2012 was mostly produced by Professional, Scientific, and Technical Services (15.1 percent of all MBE value added), Health Care and Social Assistance industry sector (12.9 percent), Accommodation and Food Services (12.0 percent), and Wholesale Trade (10.8 percent). In comparison, non-MBEs' value-added percent share were led by Manufacturing (14.1 percent of all non-MBE value added) and Professional, Scientific, and Technical Services (10.4 percent).

Estimated MBE gross operating surplus is more concentrated in Professional, Scientific, and Technical Services (13.7 percent of all MBE gross operating surplus), Manufacturing (12.5 percent), Wholesale Trade (10.9 percent), and Accommodation and Food Services (8.3 percent). For non-MBEs, gross operating surplus is concentrated in Manufacturing (18.2 percent of all non-MBE gross operating surplus), and Real Estate and Rental and Leasing (15.7 percent). Furthermore, MBEs do not necessarily have a larger share of within-sector gross operating surplus in sectors where they are more concentrated. For instance, while the leading source of gross operating surplus for MBEs in 2012 comes from Professional, Scientific, and Technical Services, the MBE sector produced \$25.1 billion in this sector compared to \$124.4 billion from non-MBEs in the same sector.

Compensation of employees by industry in MBEs are led by Health Care and Social Assistance (17.4 percent of all MBE compensation of employees), although the same sector has a much lower share of gross operating surplus at 5.7 percent.

Value-added, depicted as the sum of gross operating surplus, cost of employment, and indirect taxes, is reflected in minority firm surplus and employment. In 2012, minority firm value-added was concentrated in professional, scientific, and technical services at 15.0 percent of MBE value-added. Health care and social assistance followed at 12.1 percent, accommodation and food services at 11.5 percent, and wholesale trade at 10.6 percent. In comparison, non-MBE value-added was concentrated in manufacturing (13.6 percent) and professional, scientific, and technical services (10.3 percent).

The same exercise with 2017 American Business Survey data is done for comparison (Table 16) and that shows similar results.

Table 14. Estimated Value-added, Gross Operating Surplus, and Compensation of Employees by Sector and Race, Percent, 2012

Sector	Component	MBE	Non-MBE
Accommodation and food services	Total Value-Added	11.99%	4.81%
	Gross operating surplus	8.73%	3.00%
	Compensation of Employees	12.50%	5.41%
Administrative and support and waste management and remediation services	Total Value-Added	7.38%	6.56%
	Gross operating surplus	6.28%	4.79%
	Compensation of Employees	8.59%	8.25%
Agriculture, forestry, fishing and hunting	Total Value-Added	0.14%	0.19%
	Gross operating surplus	0.14%	0.17%
	Compensation of Employees	0.15%	0.22%
Arts, entertainment, and recreation	Total Value-Added	1.00%	1.51%
	Gross operating surplus	1.05%	1.36%
	Compensation of Employees	0.94%	1.53%
Construction	Total Value-Added	6.18%	9.99%
	Gross operating surplus	7.03%	9.74%
	Compensation of Employees	6.44%	11.24%
Educational services	Total Value-Added	0.57%	0.47%
	Gross operating surplus	0.14%	0.10%
	Compensation of Employees	0.82%	0.73%
Finance and insurance	Total Value-Added	2.04%	4.97%
	Gross operating surplus	2.22%	4.64%
	Compensation of Employees	2.06%	5.43%
Health care and social assistance	Total Value-Added	12.88%	7.26%
	Gross operating surplus	5.96%	2.88%
	Compensation of Employees	17.41%	10.61%
Information	Total Value-Added	3.80%	4.95%
	Gross operating surplus	7.20%	8.06%
	Compensation of Employees	2.26%	3.19%

Management of companies and enterprises	Total Value-Added	1.26%	1.54%
	Gross operating surplus	0.50%	0.52%
	Compensation of Employees	1.72%	2.28%
Manufacturing	Total Value-Added	8.14%	14.13%
	Gross operating surplus	13.42%	19.99%
	Compensation of Employees	6.07%	11.39%
Mining, quarrying, and oil and gas extraction	Total Value-Added	1.11%	2.35%
	Gross operating surplus	2.51%	4.57%
	Compensation of Employees	0.40%	0.91%
Other services (except public administration)	Total Value-Added	2.50%	1.94%
	Gross operating surplus	1.60%	1.07%
	Compensation of Employees	3.08%	2.59%
Professional, scientific, and technical services	Total Value-Added	15.11%	10.41%
	Gross operating surplus	13.65%	8.07%
	Compensation of Employees	17.15%	12.76%
Real estate and rental and leasing	Total Value-Added	3.18%	6.00%
	Gross operating surplus	7.26%	11.74%
	Compensation of Employees	1.28%	2.61%
Retail trade	Total Value-Added	8.65%	8.90%
	Gross operating surplus	7.01%	6.18%
	Compensation of Employees	7.68%	8.54%
Transportation and warehousing	Total Value-Added	3.15%	3.39%
	Gross operating surplus	3.45%	3.18%
	Compensation of Employees	3.11%	3.61%
Utilities	Total Value-Added	0.10%	0.24%
	Gross operating surplus	0.18%	0.35%
	Compensation of Employees	0.04%	0.11%
Wholesale trade	Total Value-Added	10.82%	10.38%
	Gross operating surplus	11.67%	9.60%
	Compensation of Employees	8.29%	8.59%

Source: Census SBO and BEA data for 2012, authors' calculations

Industry composition of MBEs does not fully explain why gross operating surplus shares in gross receipts are lower in employer MBEs compared to non-minority firms. Apart from African American-owned employer firms, which are heavily concentrated in Health Care and Social Assistance, employer MBEs are not predominantly operating in industries that are characterized by lower GOS shares in costs. One possibility is related to firm size: larger firms tend to have more established brands that allow greater product differentiation in markets, allowing them to extract a premium from consumers that flows into GOS and profits. In a sense, the brand itself is a capital good that can earn a return.

Average levels of labor compensation are also partly attributable to differences in industrial composition and to the occupational composition of their workforces. Data shows that MBE firms maintain workforces that contain more part-time workers on average, contributing to the finding that average labor compensation levels are lower in MBE firms.

Economic Growth and Population Dynamics

In the remainder of this report, a simple linear extrapolation model that makes use of much of the data reported above is applied to investigate a simple question in several parts. This set of questions follows from trends evident in the data and an extension of much of the discussion in earlier parts of the report:

Quantitatively, what are the consequences for future U.S. economic growth of the lower levels of business performance for MBEs?

Macroeconomic growth is about *changes in the supply and nature of factors that generate economic activity, and changes in the relationships between those factors*. That last element - changes in the relationships between growth factors – is by far the most challenging part of the puzzle. For this report, it will be put aside.

The simplest way to think about GDP growth is to think of economic activity as “output” and asking how that output is created. Simplifying, assume that GDP is produced by combinations of labor and capital, and the methods by which they are applied is a set of techniques we

will call “technology”. This enables a notional “production function” to be defined,

$$GDP = f\{L, K\}$$

That is, GDP is created by combining amounts of labor, L , and capital, K , via production techniques that reflect technology represented by f (for “function of”). This simple piece of explains how GDP is made, i.e., by combining amounts of inputs subject to some sort of technology or production technique. If you have more labor or capital, or more of both, you get more GDP. Additionally, it says that an improvement in technology – and increase in f – also leads to more GDP. It is reasonable to think of the increase in f as an increase in productivity.

Now, move from a static world – that is, asking what GDP is if you have a given amount of L , K , and a given technology – to a dynamic world. In the dynamic world, the question to be answered is this – how does GDP change if there are changes in labor, capital, and technology?

The use of labor inputs changes over time primarily due to changes in population growth. Capital accumulation, on the other hand, is fundamentally driven by the economic performance of the economy. Investment is the manifestation of a trade-off between current and future consumption: society is essentially making decisions about forgoing some consumption today by saving, so as to invest those savings in increased production capacity that produces more income and consumption in the future. In this sense, investment is a fundamentally dynamic activity – i.e., a function of time – involving the forming of expectations of the future with respect to all the factors that support forming them.

Most fundamental to longer run economic growth, though, is technological progress. Technological progress is manifested in economic growth as changes in productivity. Tying this all back into MBE performance, consider the following questions:

- (i) What is the comparative level of productivity and rate of productivity growth for minority labor and capital versus the national average?
- (ii) If these metrics differ from the national average, what are the consequences of the growth of the population share of minority

Table 15. Intermediate Costs and Components of Value-Added 2012 (US\$ million), Employer MBEs (%)

Industry group	Total Intermediate	Compensation of employees	Taxes on production and imports, less subsidies	Gross operating surplus	Total costs	Total value added
Total for all sectors	100.00	100.00	100.00	100.00	100.00	100.00
Mining, quarrying, and oil and gas extraction	0.56	0.40	1.37	2.51	0.87	1.11
Utilities	0.05	0.04	0.30	0.18	0.08	0.10
Construction	6.41	6.44	0.93	7.03	6.28	6.18
Wholesale trade	7.05	8.29	27.52	11.67	9.16	10.82
Information	4.23	2.26	2.93	7.20	3.99	3.80
Real estate and rental and leasing	4.29	1.28	2.67	7.26	3.67	3.18
Professional, scientific, and technical services	10.50	17.15	4.53	13.65	13.08	15.11
Management of companies and enterprises	1.23	1.72	0.47	0.50	1.24	1.26
Administrative and support and waste management and remediation services	5.19	8.59	1.97	6.28	6.41	7.38
Educational services	0.46	0.82	0.32	0.14	0.53	0.57
Health care and social assistance	11.13	17.41	3.44	5.96	12.11	12.88
Arts, entertainment, and recreation	0.87	0.94	1.32	1.05	0.94	1.00
Accommodation and food services	12.89	12.50	20.36	8.73	12.38	11.99
Agriculture, forestry, fishing and hunting	0.05	0.15	0.07	0.14	0.10	0.14
Manufacturing	20.73	6.07	4.34	13.42	13.68	8.14
Retail trade	6.20	7.68	22.55	7.01	7.57	8.65
Transportation and warehousing	4.35	3.11	2.37	3.45	3.68	3.15
Finance and insurance	2.10	2.06	1.17	2.22	2.07	2.04
Other services (except public administration)	1.71	3.08	1.37	1.60	2.15	2.50

Sources: BEA Input-output accounts, Census SBO, authors' calculations

cohorts in the U.S., and the resulting growth in the national share of business ownership and of the labor force?

Asking these questions naturally follows from the data, the empirical realities that provide the motivation for research into MBE performance, and the development of policy interventions to promote and support it.

The importance of the work of organizations like the MBDA flows directly from evidence that minority businesses have lower levels of performance compared to the national average by a range of metrics. Likewise, data on labor markets reveals that minority workers have lower average outcomes in terms of productivity and incomes than the national average. Basic arithmetic then leads to concern for the implications of a growing share of the population exhibiting lower-than-average productivity. The main implication is that if this trend continues as the demographic change occurs, the average level of productivity in the economy will decline and GDP growth will slow.

An important caveat is that the data do not suggest that the productivity of minorities is lower as such – but rather minorities tend to be in occupations that exhibit lower productivity. Minorities have historically had lower participation rates in advanced education and training that underpins higher-productivity occupations. Likewise, higher productivity enterprises tend to be those with access to newer technology, embodied in both more sophisticated capital and more educated/ more highly trained workers. Access to these high technology factors – particularly capital – requires access to sufficient levels of finance, higher than for lower technology alternatives, and the evidence for the higher costs of capital for minority entrepreneurs is well established. In addition, and related to the previous point, minority enterprises are over-represented in lower productivity sectors. These compositional effects flow both from legacy social issues and from the gaps in opportunity that were discussed earlier in the report. In both cases, there is potential for policy interventions to ameliorate their impacts. Nevertheless, right now these productivity differences exist, and the implications are a matter of arithmetic.

The IGM is built to provide some simple analysis of the implications of the data. More specifically, to investigate the data to find answers to questions like:

1. If a productivity gap exists, and if so, how large is the gap, and if catch-up is underway?
2. How fast catch-up is occurring, and if it is keeping pace with the increasing population share of minorities in such a way that GDP growth is not impeded?
3. “What-if scenarios,” such as if minority productivity levels converge with the national average, what might happen to GDP?

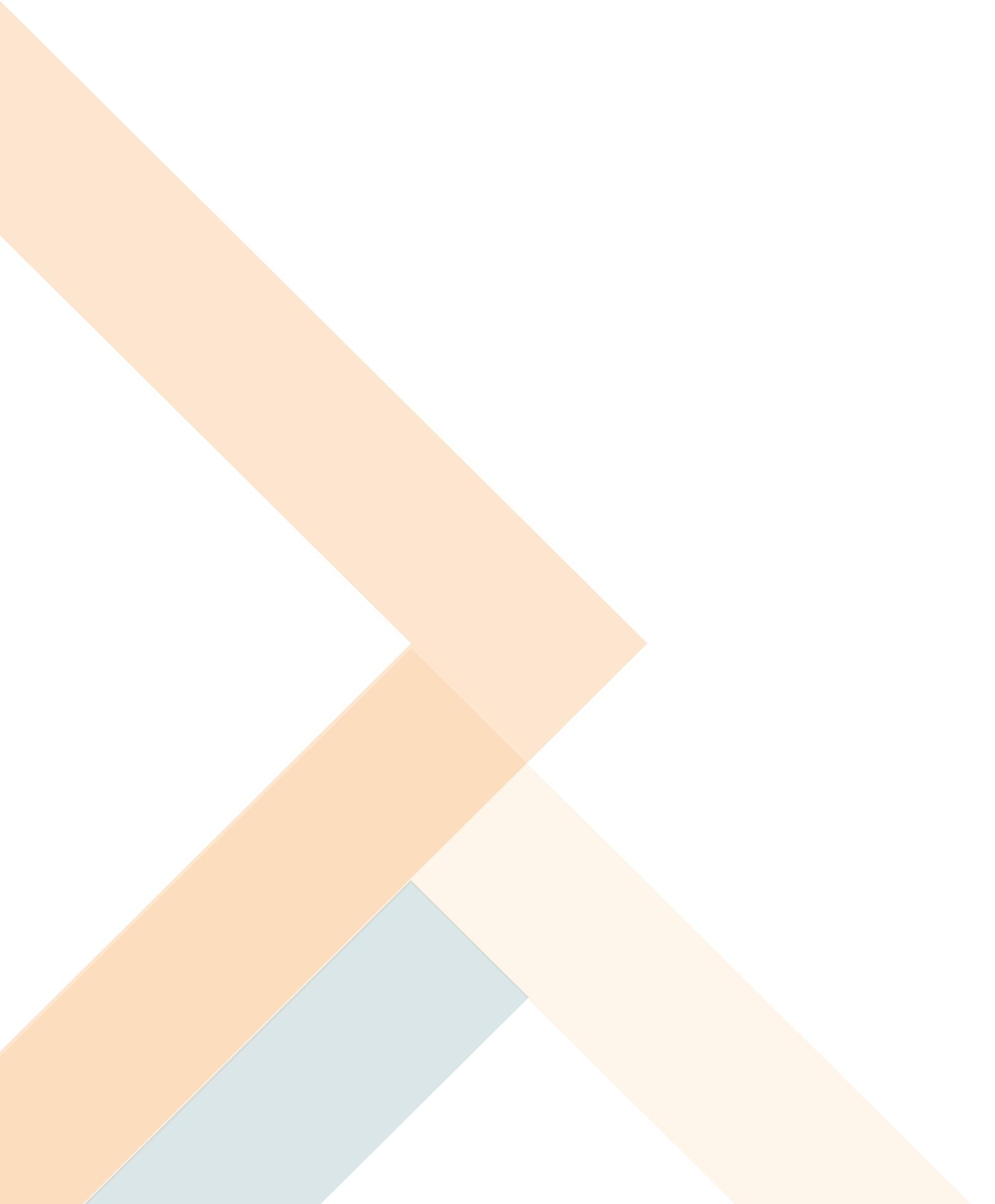
The IGM is purposely simplistic, for two reasons. One, it is designed to be accessible to a wide range of users. Second, it ingests data in its raw form, and applies simple analytical functions so as not to veer too far into speculation. For example, as has been previously discussed, by making use of the SBO data for splitting national accounts data the model database is constrained by having to fit trends to data series that have only three observations collected five years apart in periods of economic history providing very different underlying macroeconomic contexts. With only these data from which to estimate and extrapolate trends, it is not possible to determine whether the underlying trends are linear or non-linear. In this way, the interpretation of the results is also simpler to intuit.

In many ways, the results of the IGM are only the first step. The next step includes taking this sort of analysis to its logical conclusion. Excellent tools are available: for example, sophisticated, detailed dynamic Computable General Equilibrium models are capable of generating simulations of changes in entire economic systems with high levels of sectoral, occupational and a huge range of other data. These and other tools stand ready to undertake the analysis that will inform policy making, and as of now lack only the necessary data. A dedicated research and development exercise that extends the creation of IO tables for racial cohorts as described above would provide the necessary information. In the meantime, the IGM has some lessons to offer about what the data says, and about its implications for the evolution of the U.S. economy, and about – at a high level – what needs to change to address the problems it illuminates.

Table 16. Intermediate Costs and Components of Value-Added 2017 (US\$ million), Employer MBEs (%)

Industry group	Total Intermediate	Compensation of employees	Taxes on production and imports, less subsidies	Gross operating surplus	Total costs	Total value added
Total for all sectors	100.00	100.00	100.00	100.00	100.00	100.00
Mining, quarrying, and oil and gas extraction	0.00	0.18	0.00	0.00	0.15	0.25
Utilities	0.01	0.01	0.04	0.03	0.02	0.01
Construction	7.84	7.38	0.24	7.21	7.24	7.75
Wholesale trade	5.86	6.28	18.56	8.30	6.07	5.80
Information	1.31	1.69	1.48	2.93	2.08	1.30
Real estate and rental and leasing	1.06	1.18	0.95	1.63	4.55	1.06
Professional, scientific, and technical services	16.00	17.57	4.51	24.25	13.81	15.82
Management of companies and enterprises	0.61	0.50	0.09	0.27	1.39	0.61
Administrative and support and waste management and remediation services	7.46	7.05	1.38	6.95	6.33	7.38
Educational services	0.78	0.77	0.06	0.86	0.93	0.78
Health care and social assistance	19.16	16.76	1.02	12.77	11.77	18.93
Arts, entertainment, and recreation	0.75	0.86	1.17	1.28	0.92	0.74
Accommodation and food services	18.12	16.43	35.54	14.24	17.86	17.93
Agriculture, forestry, fishing and hunting	0.96	1.01	0.08	1.28	0.32	0.95
Manufacturing	7.12	6.43	1.27	5.47	8.24	7.05
Retail trade	8.17	7.75	30.41	7.71	9.08	8.09
Transportation and warehousing	3.05	2.90	2.76	2.90	4.67	3.03
Finance and insurance	1.74	1.72	0.43	1.92	1.11	1.71
Other services (except public administration)	0.00	3.53	0.00	0.00	3.47	0.82

Source: ABS and BEA data for 2017, authors' calculations



Current and Historical Trends

The IGM utilizes current and historical data on the U.S. economy that includes macroeconomic data, industry data, and data describing the demographic composition of firms. The historical period 2010 through 2019 is used to project productivity over 41 years from 2020 to 2060. In the model, long-term economic performance as measured by GDP growth is primarily determined by (i) changes labor supply and participation, and (ii) the change in labor productivity.³⁶

Data Used in Building the Baseline

The IGM utilizes annual Current Population Survey (CPS) estimates published by the Census Bureau. Workforce characteristics and employment projections from the Bureau of Labor Statistics (BLS) and Bureau of Economic Analysis (BEA) are harmonized with the CPS statistics to provide information on income, hours, population statistics, and demographic characteristics.³⁷ Specifically, for full and part-time workers, weekly hours worked and median weekly wage rates are extracted for seven demographic groups: non-Hispanic white (NH; non-minority), Hispanic (H) white, African American (AA), Alaska Indian and American Natives (AIAN), Asian, Native Hawaiian and other Pacific Islanders (NHPI), and two or more races. The model spans 51 years from 2010 to 2060.

The IGM uses the various linkages between labor markets to project the productivity of demographic groups. Ten-year historical trends are applied to the projection period from 2020 to 2060, using Census population projections as an anchor for other demographic projections such as the adult population (and a sub-category of the civilian non-institutional adult population) and labor participation projections. BLS provides employment projections to 2028 and that projection is extended out to 2060 in this report. Unemployment rates of all groups for 2015 are benchmarked as a long-run unemployment rate under the non-accelerating inflation rate of unemployment (NAIRU).

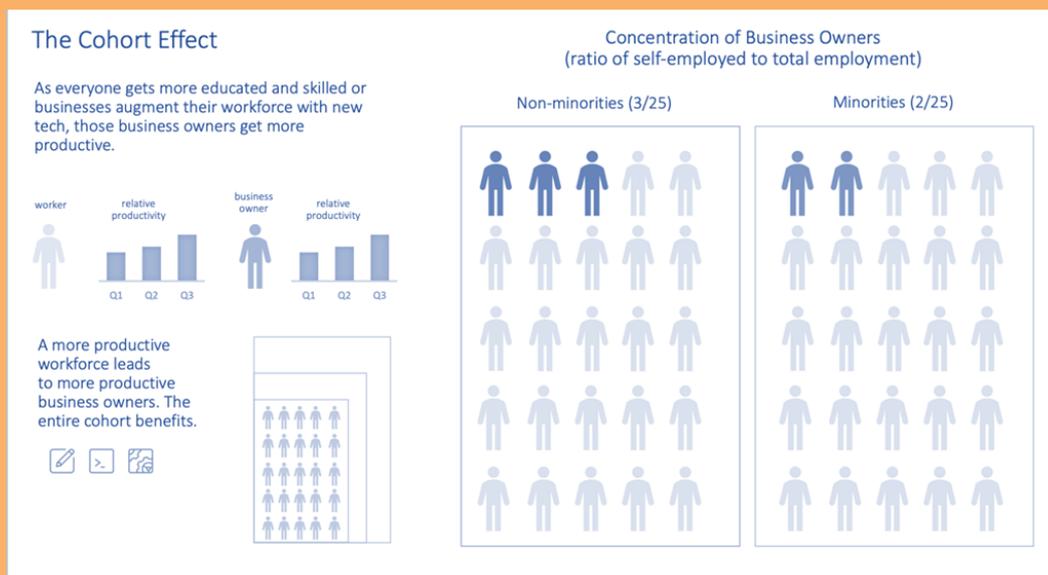
Classifiable business employment data from the 2012 Survey of Business Owners was used to measure the productivity index, as well as other features, of minority and non-minority business owners. The ratio of classifiable business employment to total employment from this data is applied to the period 2020 to 2060. In this way, the IGM model projects the productivity and GDP shares of MBEs without artificially growing the number of MBEs. This reflects some implications of historical data, namely, that the productivity of MBEs will catch up more slowly than the employment shares of MBEs.

Box 1: Connecting the Inclusive Growth Model to Minority Enterprises

The Inclusive Growth Model (IGM) contains baseline results for both employer minority business owners as well as minority labor. The available data on productivity informing the IGM is better suited to data on labor rather than business owners. Because we observe similar trends in minority labor as we do in employer minority businesses, to shock labor is to shock business owners.

Business owners are drawn from a pool of their demographic's labor force. For instance, if the entire pool of a specific demographic becomes more educated, we can assume that business owners also become more educated. This cohort effect is illustrated in the figure below.

As we shock the labor productivity of minorities, we are showing different ways that the entire labor pool of minorities can close the gap between themselves and the labor pool of non-minorities. Thus, we are also showing ways the MBE and non-MBE gap can close.



Key Variables in the IGM

Given that the main components of GDP are gross operating surplus, compensation of employees, and indirect taxes, then projecting growth in GDP must be sourced from the growth of these components. Value-added can grow in one of three ways: 1) increasing the population; 2) increasing labor force participation; and 3) the amount produced per hour (productivity).³⁸ The IGM uses these three variables to estimate growth in value-added. Census and BEA data are used to calculate growth rates in the population, by race, and labor force participation.

The productivity of MBE business owners in period t (S_t) is defined as total sales divided by employees in period t :

$$S_t = \frac{\text{sales}_t}{\text{employees}_t}$$

The growth rate of MBE productivity in period t , then, is calculated as:

$$\text{Growth rate of MBE productivity}_t = \left(\frac{S_t}{S_{t-1}} \right) - 1$$

The key variables in the calculation of business owner productivity and GDP contributions are the ratio of classifiable business employment to total employment (to find employees), the ratio of sales to payroll (to derive sales per employee), inflation-adjusted nominal output per employment, and finally the productivity-adjusted GDP contribution per unit of classifiable business employment.

Labor productivity in period t (LP_t) is defined as income divided by hours worked in period t :

$$LP_t = \frac{\text{income}_t}{\text{hours worked}_t}$$

The growth rate of worker productivity in period t , then, is calculated as:

$$\text{Growth rate of worker productivity}_t = \left(\frac{LP_t}{LP_{t-1}} \right) - 1$$

It is commonly recognized that the wage share of GDP in the United States has been

decreasing, even as labor productivity grows. To control for the differences in overall productivity growth and wage growth, the labor productivity growth rate also includes the productivity and wage growth gap, such that:

$$\begin{aligned} \text{Growth rate of worker productivity}_t = & \\ & \text{hourly wage growth rate} - \\ & (\text{inflation rate} + \text{wage share of GDP growth rate}) \end{aligned}$$

The key variables in the calculation of labor productivity and GDP contributions are gross domestic product, hours worked, the hourly wage rate (calculated as the wage share of GDP multiplied by GDP per hour worked), the nominal hourly wage growth rate, the inflation rate, and the wage share of GDP growth rate.

Hours worked are used rather than an average annual wage rate to define labor productivity because of the differences in part-time and full-time employment between minority and non-minority businesses that could potentially bias the baseline. For instance, consider two businesses of comparable size (same number of employees, and same hourly wages), but one firm has a larger share of part-time employees. Using data on annual income paid per worker would downward bias the productivity of the firm with more part-time workers. The same holds for individual labor and workforce statistics; if real wages (wages per hours worked) are not used, a potentially biased baseline could result to the extent the part-time composition varies across minority and non-minority businesses.

Capabilities and Limitations of the IGM

The IGM is a linear trend analysis tool to estimate when parity will be reached between minorities/MBEs and non-minorities/non-MBEs in population, employment, productivity, or GDP contributions. The projections are linear, that is, based on the historical data from 2010 to 2019, the IGM illustrates future trends in a linear fashion. In other words, we expect the rates of change in the future reflect those of the past.

The IGM benefits from transparency of the model structure where the results and processes are easily interpreted, and the results are not sensitive to the modeler's choices of behavioral elasticities. But the framework and modeling approach with

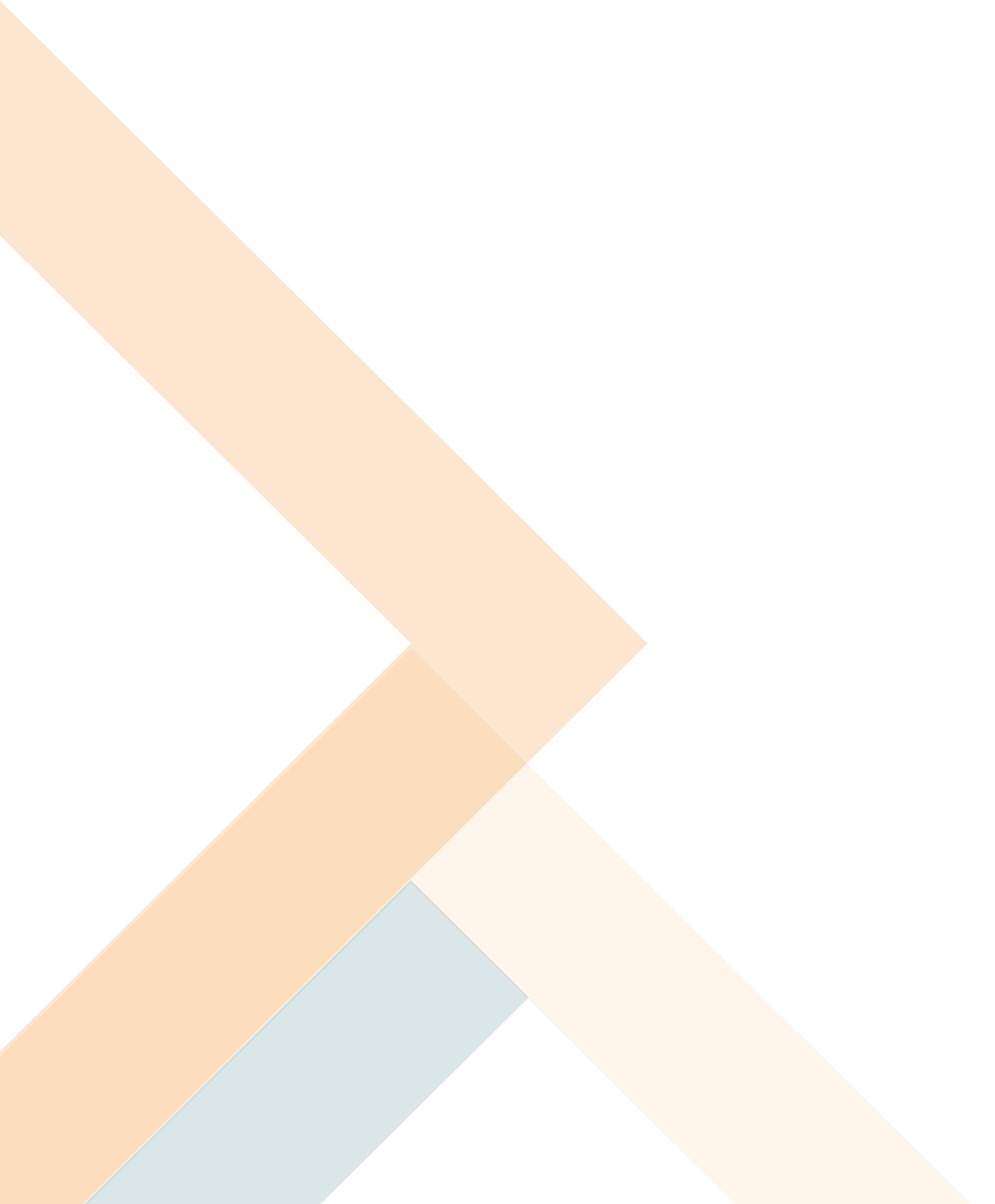
respect to the baseline and simulations has its limitations. While the transparency and limited role of subjective behavioral elasticities is a strength, it may also be a limitation—the user cannot (easily) change the behavioral parameters. To the extent that future trends diverge from historical rates of change, baseline trends can be modified with new data or a shock to key variables in the model. Modifications to the baseline include shocks to unemployment, labor productivity levels (a one-time shift), or labor productivity growth. For instance, employment and productivity changes from COVID-19 could be incorporated into the baseline as a modified trend or as a temporary shock to employment or productivity as an alternative scenario.

This analysis is based on linear extrapolations of labor productivity rates and sectoral and occupational compositions. That is, the analysis considers the implications of current patterns continuing. While this is one possible scenario, it is also possible the future will unfold in non-linear ways. For instance, it is possible the rate at which MBEs move into higher productivity sectors and minorities move into higher productivity occupations will speed up, in which case the actual time it takes the GDP to employment parity between minority and non-minority to converge will be less than what is projected. It is also possible the rate at which MBEs and minorities move into higher productivity sectors and occupations will slow down, in which case it will take longer for that gap to close. Notwithstanding, the linear assumption is a good starting point for building the baseline.

The results are useful for policy analysis because of the determination of long-term trends. The transparent Excel-based framework can experiment “what-if” scenarios in user-friendly ways.

As population changes over time, the factors that determine productivity changes across MBEs, minority workers, and the economy will not only be demographic changes but also the extent to which MBEs and minorities can access those higher productivity sectors and occupations. While one exercise to consider is all minorities immediately switching into higher productivity jobs, such as some studies do,³⁹ this report and the IGM explores the paths that can get us there over time.





Baseline Results: Minority Business Enterprises by 2060

This section describes the baseline results for minority businesses and workers. As the analysis below shows, the population of minorities increases over time, and their GDP contribution rises but not at the rate of their population growth. Minority GDP contribution is not expected to catch up to their population growth until 15 years after they become the majority. Unless MBE and minority productivity increases at a higher rate, their GDP contribution will not match their growth in terms of employment contributions until well after minorities become the majority of population and workforce.

Population

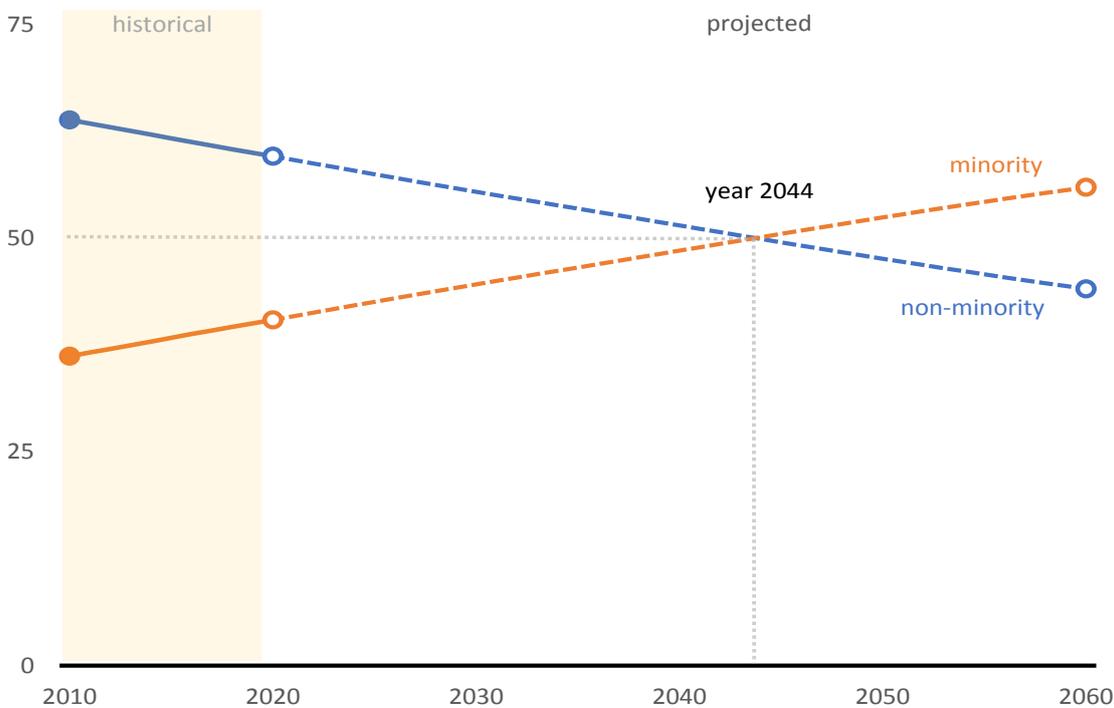
The population growth rate of minorities was already significantly higher than that of non-minorities. That growth rate, while decreasing over time, will still average 1.4 percent from 2020 to 2060 compared to -0.2

percent for non-minorities. Using the IGM, the minority population is projected to exceed the non-minority population by 2044 as shown in Figure 2 (and by 2050 if one considers only the civilian non-institutional adult population⁴⁰ which is not shown here). These results are similar to those of the U.S. Census Bureau’s National Population Projection Report (Census 2017), which predicts that the U.S. population will become ‘minority white’ in 2045.

Employment

Over the projection period, the unemployment rates of minority groups is 5.4 percent on average, consistently higher than the unemployment rates non-minority workers, which is 4.1 percent on average. This is true even as the gap between minority and non-minority unemployment rate decreases over time.

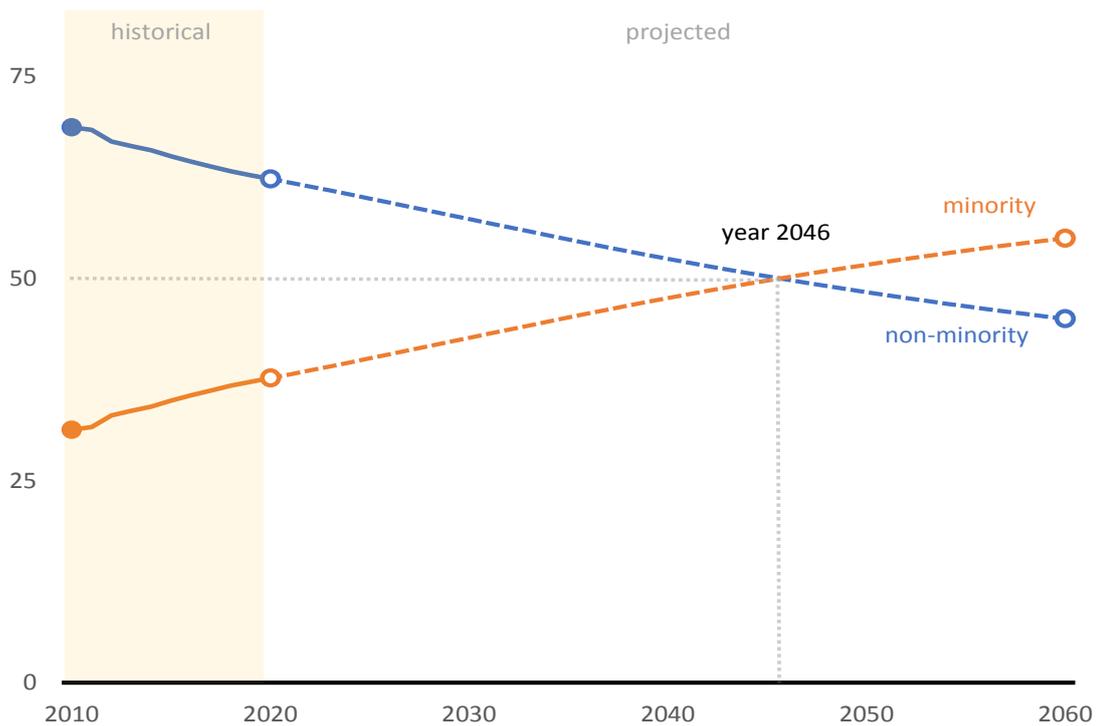
Figure 30. Population shares of minority and non-minority groups (%)



Source: Census, authors’ calculations

Data note: the closed and un-filled 2020 data represent the first year of IGM projections.

Figure 31. Employment shares (%)



Source: BLS, BEA, Census, authors' calculations

Employment shares are expected to grow parallel with growth in population shares. Minority employment is projected to exceed non-minority employment as a majority after 2046 (Figure 31). Minority employment is projected to grow 1.6 percent on average. Non-minority employment is projected to decrease at an average of 0.2 percent.

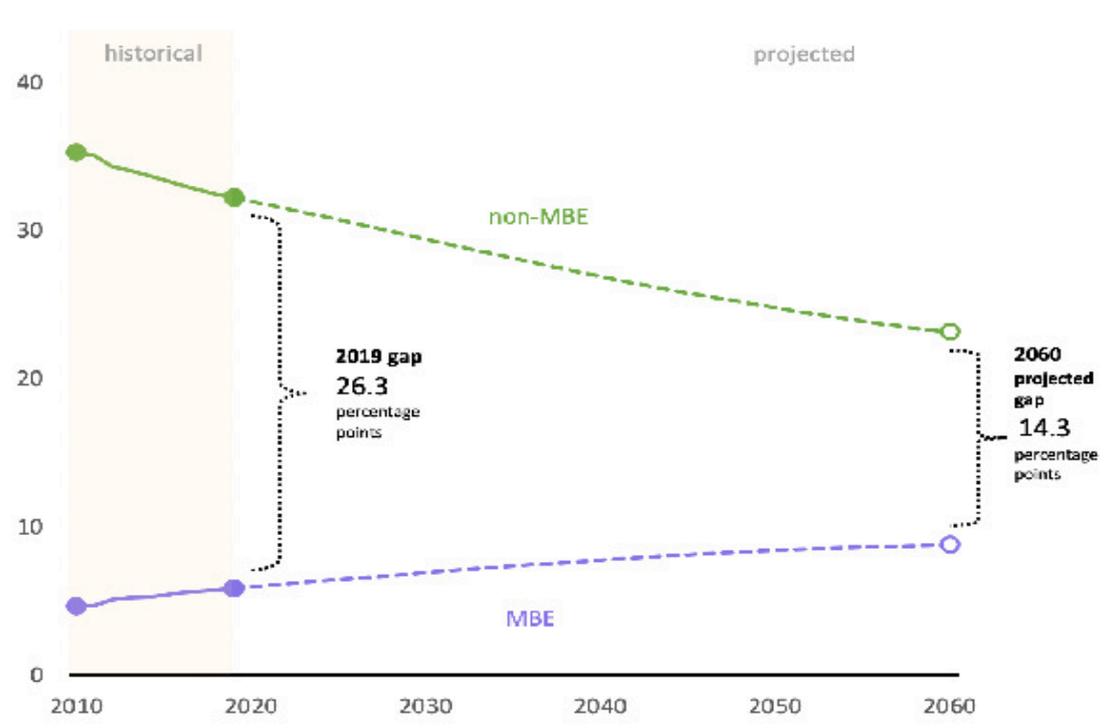
The share of the workforce employed by classifiable MBEs (the employment contribution of minority classifiable businesses) will increase from 5.9 percent in 2020 to 8.8 percent in 2060. This is true even as the total employment contributions of non-minority classifiable businesses are projected to decrease from 31.9 percent in 2020 to 23.1 percent in 2060. The gap is expected to narrow from 26.3 percentage points in 2020 to 14.3 percentage points by 2060 (Figure 32).

Labor Force Participation

Minority labor force participation will catch up to non-minority labor force participation in 2045 and then surpass it, with projections at 64.9 percent for minorities and 61.3 percent for non-minorities in 2060. This result reflects the 2.5 percent average growth in labor

“Minorities are a growing share of the U.S. employment and by 2046 will reach 50 percent then surpass the non-minority share”

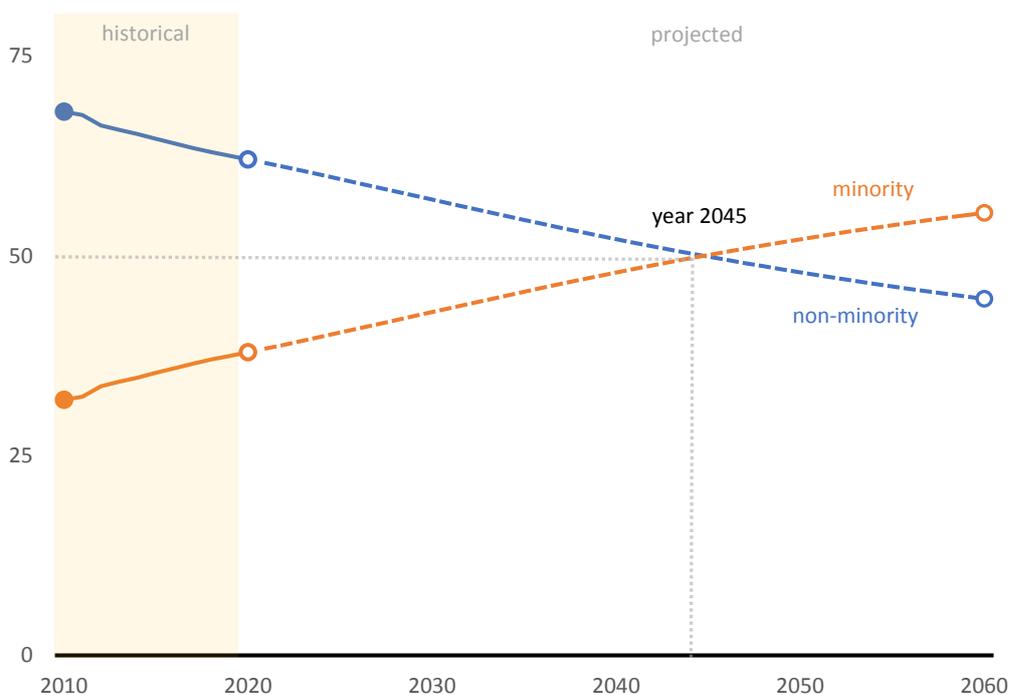
Figure 32. Total employment contributions of classifiable businesses (%)



Source: BLS, BEA, Census, authors' calculations

Data note: While this supporting evidence does not speak directly to the issue, the assumption can be made from this data that minority businesses tend to hire minority labor, even if they are hiring outside of their own minority group. The closed and filled-in 2019 data markers represent BLS historical data.

Figure 33. Labor force participation shares (%)



Source: BLS, BEA, Census, authors' calculations

participation of minority groups over the past nine years, as well as the historical negative growth rates of the non-minority group, which is on average -0.25 percent.

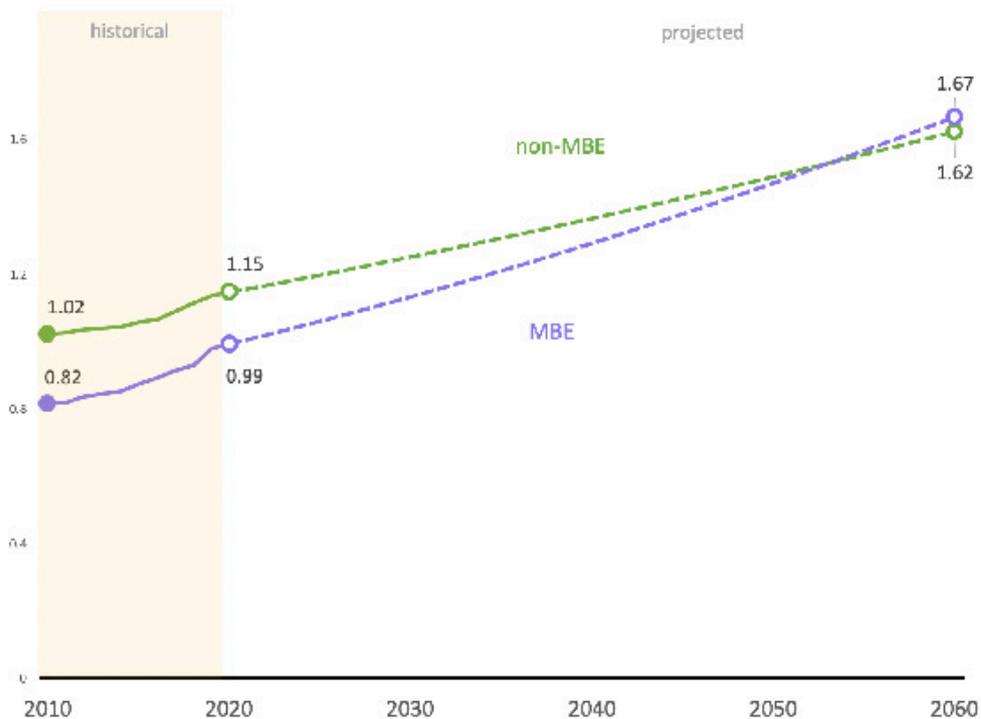
Productivity

The productivity gap between employer minority and non-minority businesses will narrow over and intersect in 2053 if current linear trends continue (Figure 34). The productivity index for classifiable employer businesses is calculated as total sales per employee.

The productivity gap between minority and non-minority workers (Figure 35), however, stays constant. The productivity index for workers is calculated as the real hourly wage rate. The productivity gap may reflect several factors including the different wages received by minority and non-minority employees, and by the full-time versus part-time composition of the minority labor force. Data indicate part-time

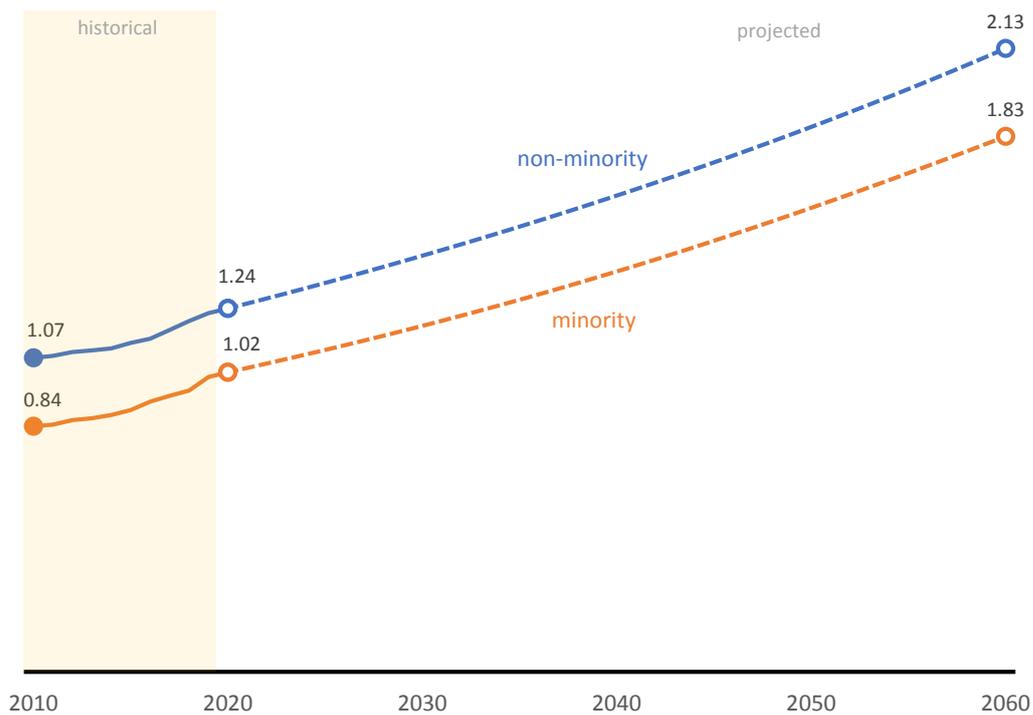
minority worker wages are expected to grow more slowly than part-time non-minority wages, and hence the worker productivity gap stays constant (even widens slightly). These findings underscore the importance of policies that facilitate or even incentivize minority productivity as well as minority workers moving out of part-time employment into full-time employment.

Figure 34. Productivity index for business owners in classifiable businesses



Source: Authors' calculations
 Data note: MBE firms do not necessarily hire minorities.

Figure 35. Productivity index for workers



Source: Authors' calculations.



GDP Contributions⁴¹

The contribution to U.S. GDP by employer MBEs is expected to increase three-fold from 2020 to 2060, from 2.6 percent to 7.5 percent. This is compared to non-minority employer business GDP contributions, which will increase by less from 15.9 percent to 19.3 percent (Figure 36). Non-minority businesses continue to grow in terms of contribution to GDP despite decreasing numbers of classifiable businesses because of higher levels of productivity compared with MBEs.

The productivity gap driving the opportunity gap between MBEs and non-MBEs could lead to a persistent loss of \$5.3 trillion to the U.S. economy per year by 2060, or about 11 percent of the total economy.⁴²

GDP-employment parity is the ratio of a group's GDP contributions to their employment. For instance, if a group is 50 percent of the workforce, and that workforce is contributing 50 percent to GDP, then the GDP-employment parity will be 1 for that group. Figure 37 shows the GDP-employment parity for MBEs and non-MBEs.

The GDP-employment parity for MBEs is less than that for non-MBEs, and the lower level will persist to at least 2053. In 2020, GDP-employment parity is 0.43 for MBEs and 0.50 for non-MBEs. By 2060, the parities are 0.86 and 0.84, respectively.

Note that the GDP contributions of classifiable non-minority and minority businesses are projected to be lower than their employment contributions because the business productivity of classifiable businesses is lower than non-classifiable business productivity until 2053. In other words, the sales of an employee at a classifiable business (typically small firms) yields on average a lower GDP contribution than the sales of an employee in non-classifiable businesses (typically larger firms). This finding on GDP contributions despite growing productivity levels underscores the importance of policies that grow the size and productivity of minority business enterprises, as well as observing the sectoral compositions.

Minority workers' GDP contributions will continue to be lower than that of non-minorities' GDP contributions due to the lower productivity of minority employment. Minority GDP contributions are not projected to catch up

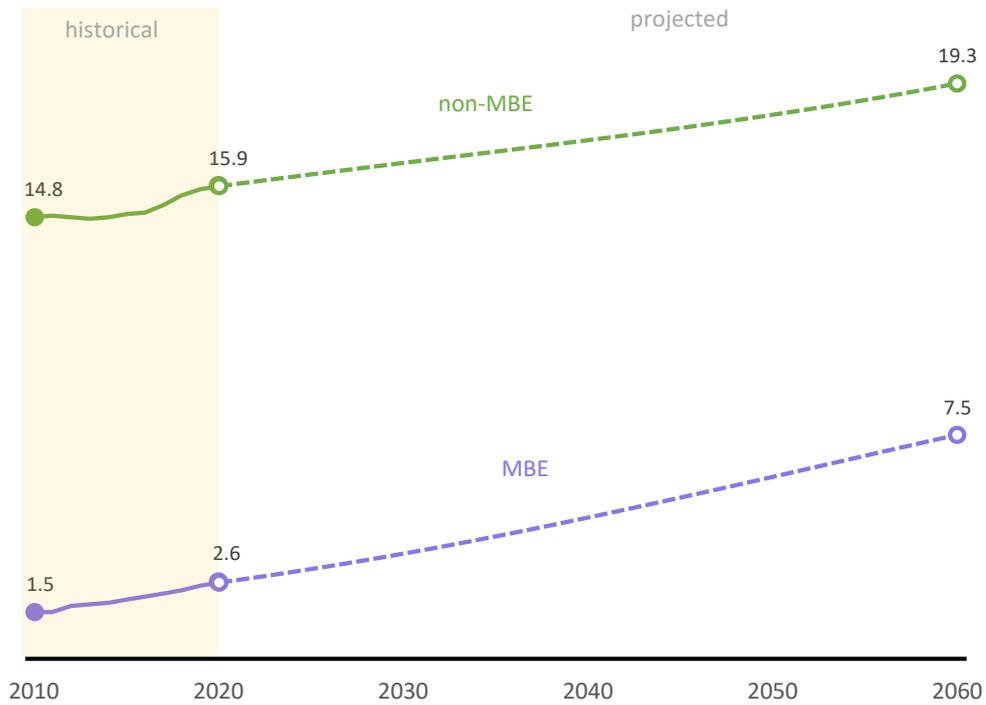
with that of non-minority until 2059, which is 13 years after minority employment overtakes non-minority (Figure 38).

The minority employment share continues to increase until at least 2060, and while the minority GDP contribution also increases over this period, there remains a gap between the minority employment and GDP contribution (Figure 39).

The GDP to employment parity of minorities will be less than unity (when there is a one-to-one relationship between GDP contribution shares and employment shares). For example, in 2059, minorities are contributing 50 percent to the economy but are 56 percent of employment (Figure 40).

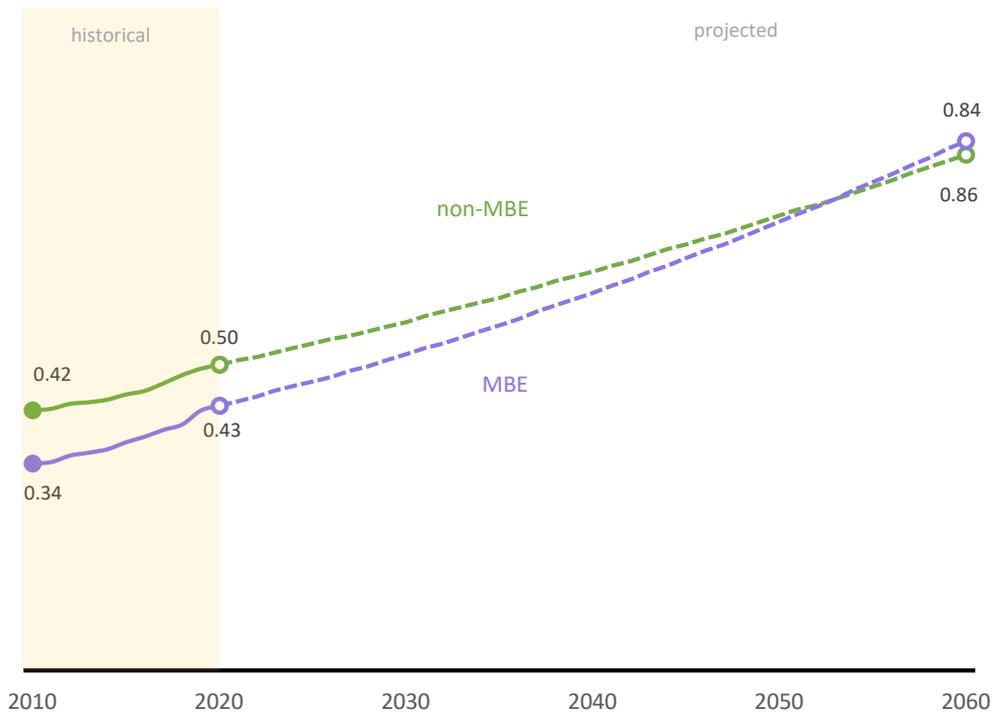
“The MBE contribution to U.S. GDP is projected to increase three-fold from 2020 to 2060, from 2.5 percent to 7.4 percent”

Figure 36. GDP contributions of classifiable businesses (%)



Source: Census SBO, authors' calculations
 Data note: MBE firms do not necessarily hire minorities.

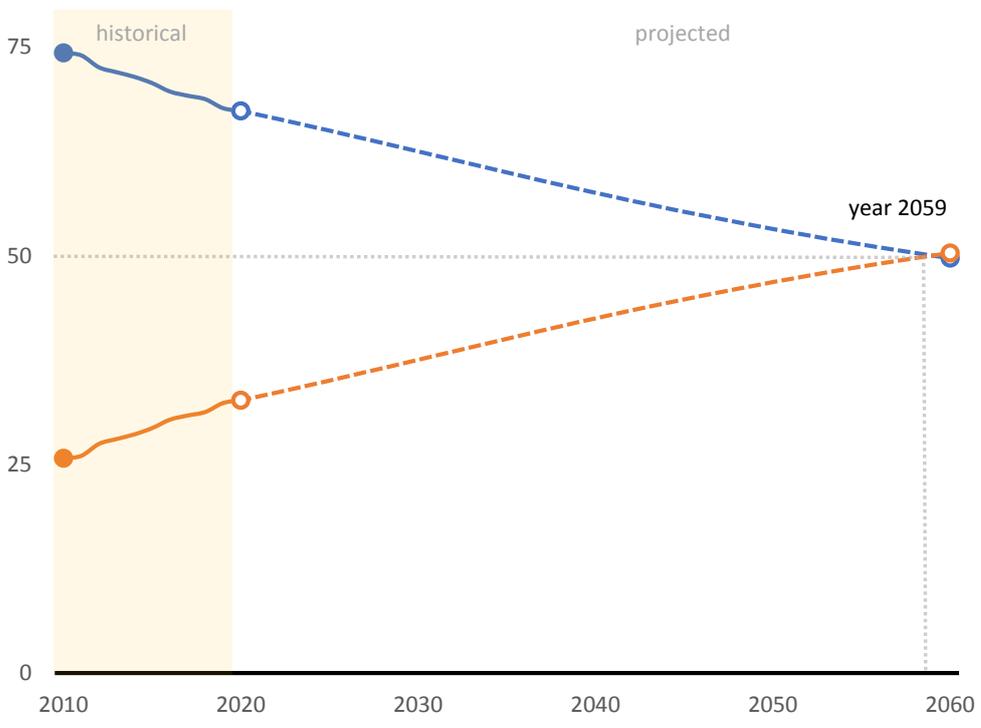
Figure 37. GDP-Employment parity, classifiable businesses



Source: Census SBO, authors' calculations
 Data note: Calculated as the ratio of GDP contributions to employment contributions.

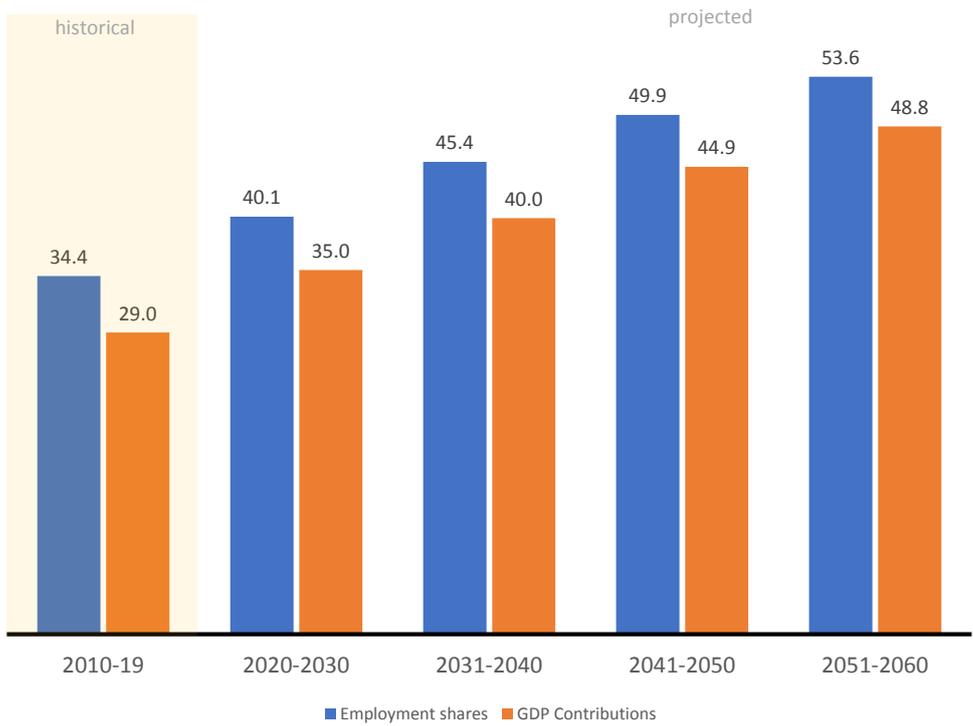
“The gap between minority employment and minority contribution to GDP has narrowed but not closed. With current MBE and employment trends, the gap is not expected to close until 2059”

Figure 38. GDP contribution shares (%)



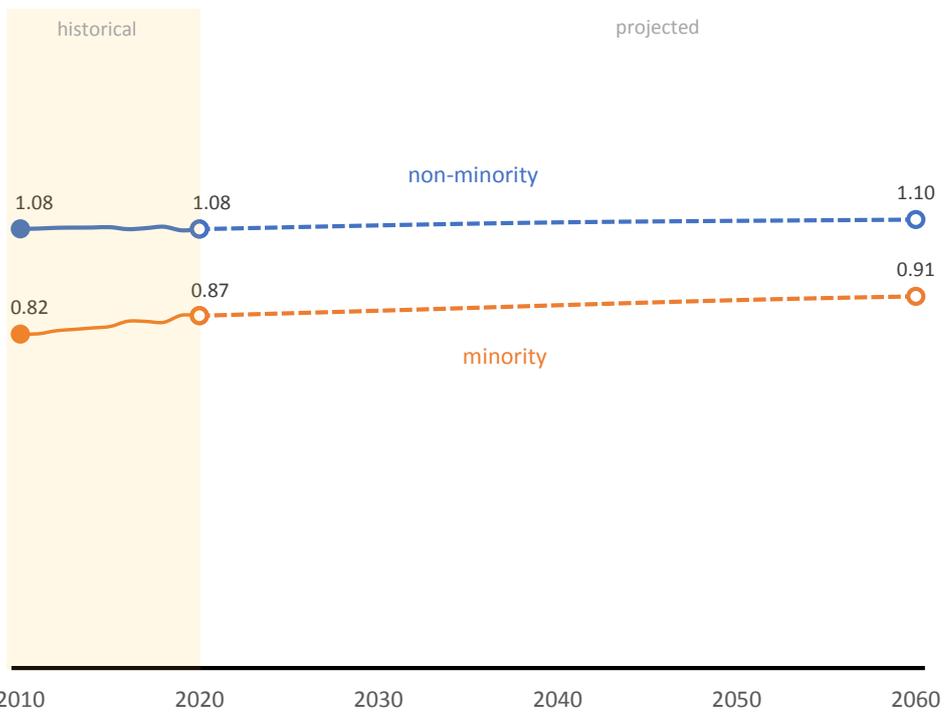
Source: Authors' calculations

Figure 39. Minority employment shares and GDP contributions, historical and projected (%)



Source: Authors' calculations

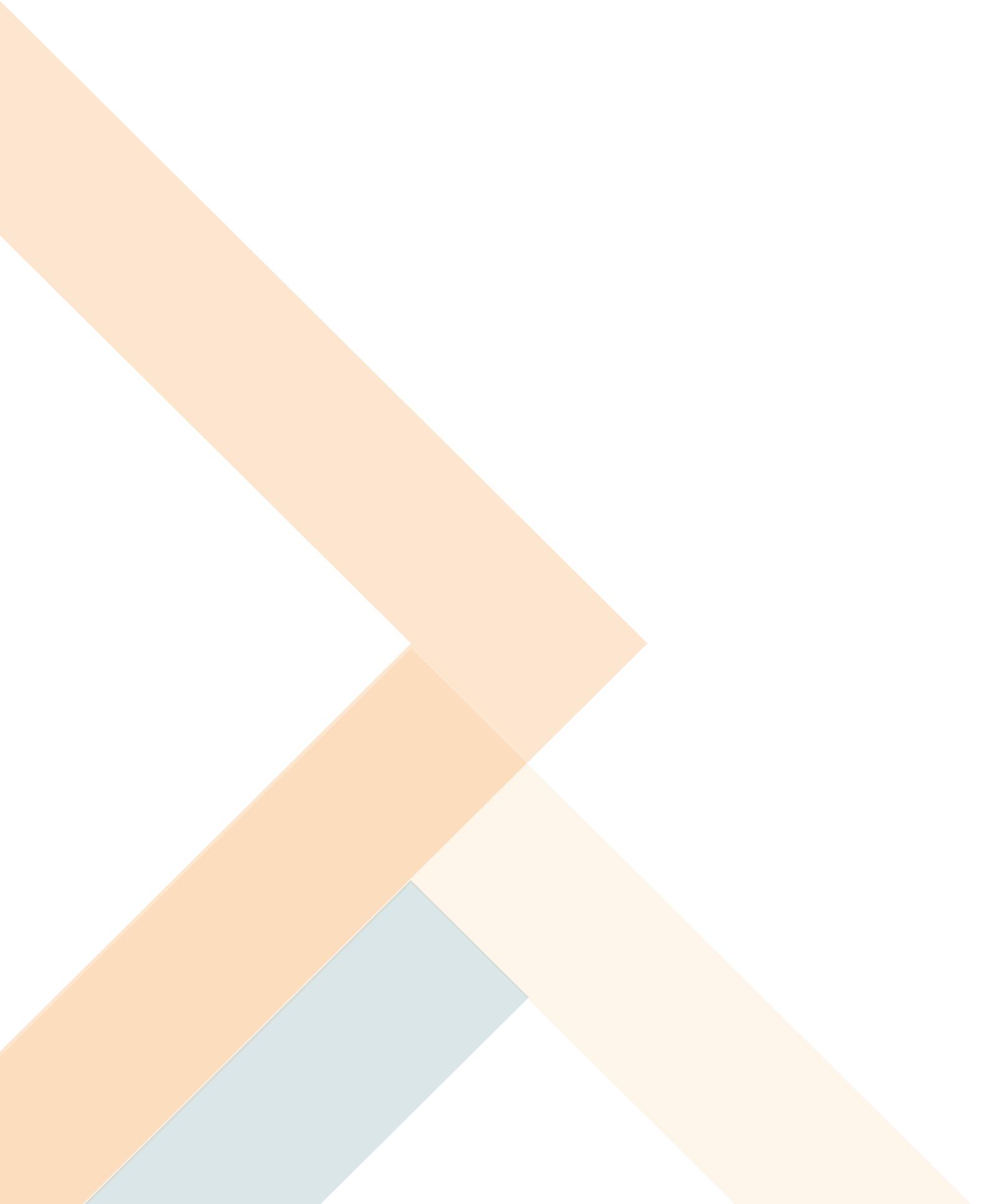
Figure 40. GDP-Employment share parity



Source: Authors' calculations

Data note: Calculated as the ratio of GDP shares to Employment Shares.





Concluding Remarks

This report can be used by federal policymakers and private sector actors as well as academia to support evidence-based discussions regarding the current and future contributions of MBEs to the U.S. economy. The findings shine a light not only on the implications for U.S. economic growth should the productivity gap remain, but also to track progress over time as the data in the model is updated annually.

The findings in this report offer a baseline for ongoing comparative analysis examining the changing economic landscape and contributions to the U.S. economy by minority businesses. MBDA focuses on promoting the productivity and well-being of minority businesses in the United States.

The population of minorities is on pace to catch up to that of non-minorities in 2044, and minority workers will exceed non-minority workers by 2046. While minority workers are moving into occupations characterized by higher productivity and MBEs are moving into sectors characterized by higher productivity, this increase in productivity has not kept pace with the increase in demographics.

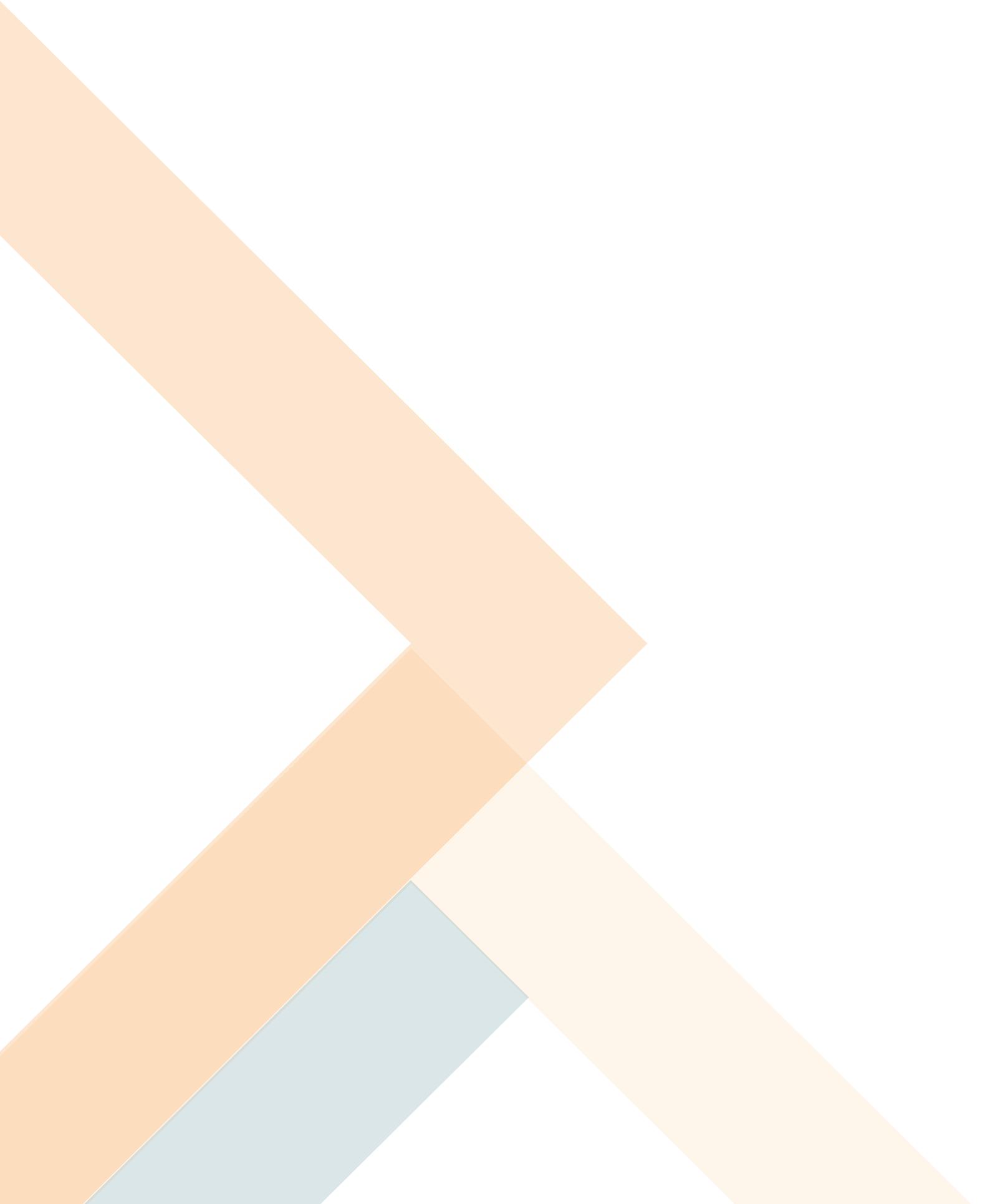
The analysis presented in this report indicates that unless MBE and minority productivity increases at a higher rate than historical trends, their GDP contribution will not match their growth in terms of employment contributions until well after minorities become the majority of population and workforce. MBEs and minority workers as a growing share of the economy with lower productivity has implications for U.S. GDP growth and the overall size of the U.S. economy.

The economic policy challenge is to identify underlying drivers of MBE and minority productivity and policy efforts that can accelerate parity of MBE and minority GDP contributions. If nothing changes, MBEs and minorities are not projected to reach GDP contribution parity with non-minorities until 15 years after population and 13 years after employment reach the same levels. But parity is accelerated with higher productivity levels. Identifying policy levers and private sector initiatives that support higher productivity growth of minority businesses must be a policy imperative.



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End Notes

1. Classifiable firms are closely held enterprises that can be meaningfully distinguished by the race and ethnicity of ownership. Widely held firms, like those listed on financial exchanges, are not deemed classifiable under this definition.
2. For the purposes of this report and for the Inclusive Growth Model, MBDA utilizes data on employer MBEs, and excludes non-employer MBEs.
3. The “opportunity gap” refers to the difference between MBE and non-MBE value-added contributions to GDP and is based on linear trends.
4. For the purposes of this report and for the Inclusive Growth Model, MBDA utilizes data on employer MBEs, and excludes non-employer MBEs.
5. The Current Population Survey (CPSA) at the Bureau of Labor Statistics and the annual EEO-1 survey released by the Equal Employment Opportunity Commission (EEOC) speak to occupation and industry information. While the latter focuses on occupational information only, the former provides both occupation and industry information. There are two differences in the data between the surveys. The first difference is that EEOC data provides a complete decomposition of a minority group into its ethnic and race oriented sub-groups. The CPSA minority group data overlaps ethnic-oriented data and race-oriented data. The second difference is in their occupation classifications. The EEOC’s classification is more skill and task oriented—which is more relevant to assessing the implications of emerging technologies on minority employment. While this supporting evidence does not speak directly to the issue, the assumption can be made from this data that minority businesses tend to hire minority labor, even if they are hiring outside of their own minority group.
6. William Frey, “Declines in white youth population are countered by gains in other racial groups,” The Brookings Institute, (July 2019), <https://www.brookings.edu/research/less-than-half-of-us-children-under-15-are-white-census-shows/>.
7. U.S. Small Business Administration, “Crossing the Employer Threshold: Determinants of Firms Hiring their First Employee,” by Robert W. Fairlie, (Santa Cruz, December 2013), <https://www.sba.gov/sites/default/files/rs418tot.pdf>.
8. The Kauffman Index of Entrepreneurial Activity showed U.S. entrepreneurial activity rose in 2009 to the highest rate in 14 years, despite the Great Recession. The greatest increase was seen in African Americans and older Americans. See Kauffman Foundation. See also Christopher Dawson, Andrew Henley and Paul Latreille, “Why Do Individuals Choose Self Employment?,” (Discussion Paper, Institute for the Study of Labor, Bonn, Germany); MarketWired, “Despite Recession, U.S. Entrepreneurial Activity Rises in 2009 to Highest Rate in 14 Years,” [marketwired.com](http://www.marketwired.com/press-release/despite-recession-us-entrepreneurial-activity-rises-2009-highest-rate-14-years-kauffman-1263796.htm), <http://www.marketwired.com/press-release/despite-recession-us-entrepreneurial-activity-rises-2009-highest-rate-14-years-kauffman-1263796.htm>; U.S. Department of Commerce, Minority Business Development Agency, “The State of Minority Business Enterprises: An Overview of the 2012 Survey of Business Owners,” (Washington, D.C. 2018).
9. For completeness, there is third definition sometimes applied, particularly in economic modeling, that is called “GDP at factor-cost” that excludes the indirect taxes and focuses on the payments to primary factors (labor and fixed factors such as capital and land).
10. If the goal is to understand MBE contributions to macroeconomic aggregates defined by value-added concepts, like GDP, and to distinguish their differences to non-minority firms, the problem is significant. The MBE-reporting data sources also lack detail on MBE intermediate inputs and sales destination, limiting the scope for placing MBEs in the supply chain. For examining the MBE contribution to GDP, the ideal data would have the value-added, intermediate input costs, and implicit supply-chain information contained in the input-output data but split-up by the race and

ethnicity of workers and business owners. The value-added data would then provide a link from MBEs directly to GDP, and the details of the costs and sales of MBEs in the intermediate and sales data would contain information on the participation of MBEs in supply chains and provide deeper insights into their cost structures that reflect production technologies.

11. This misunderstanding is rife in economic commentary on business news channels and other public forums, where observers may quote a number for a company's sales or turnover and then incorrectly tout this as representing some percentage of GDP.
12. "The North American Industry Classification System (NAICS) is a 2- through 6-digit hierarchical classification system, offering five levels of detail. Each digit in the code is part of a series of progressively narrower categories, and the more digits in the code signify greater classification detail. The first two digits designate the economic sector, the third digit designates the subsector, the fourth digit designates the industry group, the fifth digit designates the NAICS industry, and the sixth digit designates the national industry. The 5-digit NAICS code is the level at which there is comparability in code and definitions for most of the NAICS sectors across the three countries participating in NAICS (the United States, Canada, and Mexico). The 6-digit level allows for the United States, Canada, and Mexico each to have country-specific detail. A complete and valid NAICS code contains six digits." Source: U.S. Census Bureau, available at <https://www.census.gov/eos/www/naics/faqs/faqs.html>.
13. There are several other issues with the allocation of firms to an ethnicity and race in the surveys including: a) In the SBO (2002) respondents were given the option of selecting a race or Hispanic. SBO (2007 and 2012) required a race and ethnicity. Moreover, no estimates of total minorities and nonminorities were provided. This makes comparison between the 2002 and 2007 & 2012 data problematic. For this reason, we include the 2002 data for those interested, however, we do not examine growth rates between 2002 and 2007. b) The owner/s of at least 51 percent may identify with multiple races and ethnicities. For this reason, totals are not always the sum of their elements. Instead, we use the U.S. Census Bureau's estimated totals of minorities obtained from the SBO and ASE, which takes this into account.
14. Christopher Dawson, Andrew Henley and Paul Latreille, "Why Do Individuals Choose Self Employment?," (Discussion Paper, Institute for the Study of Labor, Bonn, Germany); Pew Research Center, "Federal officials may revamp how Americans identify race, ethnicity on census and other forms," by D'vera Cohn (Washington, D.C., October 2016), <http://www.pewresearch.org/fact-tank/2016/10/04/federal-officials-may-revamp-how-americans-identify-race-ethnicity-on-census-and-other-forms/>.
15. See: <https://www.census.gov/programs-surveys/sbo/technical-documentation/methodology/2012-sbo-methodology.html>.
16. There is no clear answer to this aggregation issue when dealing the classification of firms as entities within industry groups. This is not meant to imply that Census has erred here in any way.
17. This assumption allows us to calculate industry shares for firm-number data and provides a reasonable indication of proportions.
18. According to the U.S. National Bureau of Economic Research (the official arbiter of U.S. recessions) the recession began in December 2007 and ended in June 2009, and thus extended over eighteen months.
19. GDP can be measured in nominal (current dollar) or real (constant dollar) terms, and (normally) is reported for 12-month periods that can have different starting and end dates. Data from the input-output accounts for GDP aligns perfectly with national accounts data, and to data reported in international databases like the World Bank's World Economic Outlook.

20. GDP, as a production-side metric, is less satisfactory as a measure of economic welfare than variables like gross national income (GNI). For the U.S., however, GDP and GNI track closely together over time.
21. “Suggests” is a term used intentionally and tentatively, as two data points for MBEs in the SBO is certainly not ideal. Nevertheless, this is not surprising, and provides some support for the potential to use movements in annual data for metrics like total costs and GDP from the IO tables to fill-in some of the context for datasets like the SBO data that are available less frequently.
22. Access to more comprehensive cost-related data distinguishing minority ownership groups would provide an interesting source of comparison with the nonminority business cohort - it is likely to reveal more about the differences in the MBE development experience historically and, most importantly, provide key insights for policy development.
23. The GDP deflator is a price index that captures only domestically produced goods. It is valid in adjusting GDP, but less so for measures such as total costs, gross receipts and intermediate inputs as the latter includes imported goods. Calculated using GDP deflator indexes sourced from the St. Louis Fed. See: <https://fred.stlouisfed.org/series/GDPDEF>.
24. The SBO is also reported in current dollars.
25. The SBO 20-sector data is not exactly aligned with NAICS 2-digit classifications. The remapping accounts for differences.
26. Other out of scope 3-digit sectors included Rail Transportation, the central banking component of Federal Reserve banks, credit intermediation, and related activities (a 6-digit sector called Monetary authorities and depository credit intermediation), and Funds, Trusts and Other Financial Vehicles. Adjustments for higher-order omission of sectors (like the 6-digit central banking sector) were made by subtracting the appropriate proportion from the more aggregated 2 or 3-digit sector.
27. This report does not (generally) calculate, or refer to, growth rates in reported metrics between 2012 (SBO, 2012) and 2014/15 (ASE, 2014 and 2015) because the data are sourced from different surveys that use differing methods to compile the data, particularly in relation to gross sales receipts and numbers of employees. Extracting insights from comparisons between different datasets is difficult as the datasets collect data in different ways: the SBO is primarily a survey-based dataset, while the ASE collects data from administrative sources. Drawing conclusions from comparisons between these datasets warrants caution (see U.S. Census Bureau “2017 Annual Survey of Entrepreneurs: Guidance for Data Users”). Both SBO and ASE datasets also diverge in absolute terms from data reported by the Small Business Administration for the same period, although trends and broad rates of change are reasonably consistent.
28. Population-adjusted annual growth rate accounts for firm-number growth over-and-above growth in the respective populations.
29. Vermont, Alaska, Oregon, Wyoming.
30. For more information on parity ratios, see U.S. Department of Commerce, Minority Business Development Agency, “The State of Minority Business Enterprises: An Overview of the 2012 Survey of Business Owners,” (Washington, D.C. 2018).
31. The relative shares of gross operating surplus and labor compensation in total value-added.
32. The category “Other Services” includes establishments not provided for elsewhere in the classification system that are engaged in activities such as equipment and machinery repair, promoting religious activities, grant-making, advocacy, providing dry-cleaning and laundry services, personal care services, and dating services. “Other services” does not include Public Administration.

33. The services to manufacturing ratio in the District of Columbia is 317.91. The next highest ratio is 38.89 in Hawaii.
34. The top half of states in terms of services-to-manufacturing ratio is respectively: Hawaii, Alaska, New York, Florida, Nevada, New Mexico, Maryland, Delaware, Montana, Rhode Island, Colorado, New Jersey, North Dakota, Arizona, South Dakota, Virginia, Wyoming, Massachusetts, Maine, New Hampshire, Georgia, California, Connecticut, Pennsylvania, and West Virginia.
35. Note that some industries are omitted in the SBO for anonymity of firm owners.
36. These two variables represent main components of value-added: gross operating surplus, compensation of employees, and indirect taxes.
37. Detailed descriptions of data sources are included in the IGM technical summary.
38. On the margin, productivity may also increase the growth rate of gross operating surplus.
39. McKinsey, "Automation and the Future of the African American workforce," (2018) <https://www.mckinsey.com/featured-insights/future-of-work/automation-and-the-future-of-the-african-american-workforce>.
40. The civilian noninstitutional population refers to people 16 years of age and older residing in the 50 States and the District of Columbia who are not inmates of institutions (penal, mental facilities, homes for the aged), and who are not on active duty in the Armed Forces.
41. In *The State of Minority Business Enterprises: An Overview of the 2012 Survey of Business Owners*, MBE contributions to the overall economy are calculated as value-added. As such, the dollar values of GDP contributions here may differ from the contribution estimates in the State of MBEs report.
42. The figure \$5.3 trillion is the difference between the non-MBE contribution to the economy and the MBE contribution to the economy in 2060. This difference is largely driven by the persistent productivity gap between MBEs and non-MBEs.
43. See white paper on "Minority Businesses and the Productivity Imperative."



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