



MISSISSIPPI STATE
UNIVERSITY™

The Economic Value of Mississippi State University

EXECUTIVE SUMMARY



MISSISSIPPI

WITH a presence in each of Mississippi's 82 counties, Mississippi State University (MSU) is an integral part of the state, creating opportunities not only for students to achieve their educational and career goals, but also opportunities for every region of the state to grow and prosper. Building on the university's land-grant mission, MSU conducts outreach across the state in support of agriculture, commerce, and community development.

MSU influences both the lives of its students and the state economy. The university supports a variety of industries in Mississippi, serves state businesses, and benefits society as a whole in Mississippi from an expanded economy and improved quality of life. The benefits created by MSU even extend to the state and local government through increased tax revenues and public sector savings.

This study measures the economic impacts created by MSU on the business community and the benefits the university generates in return for the investments made by its key stakeholder groups—students, taxpayers, and society. The following two analyses are presented:



Economic impact analysis



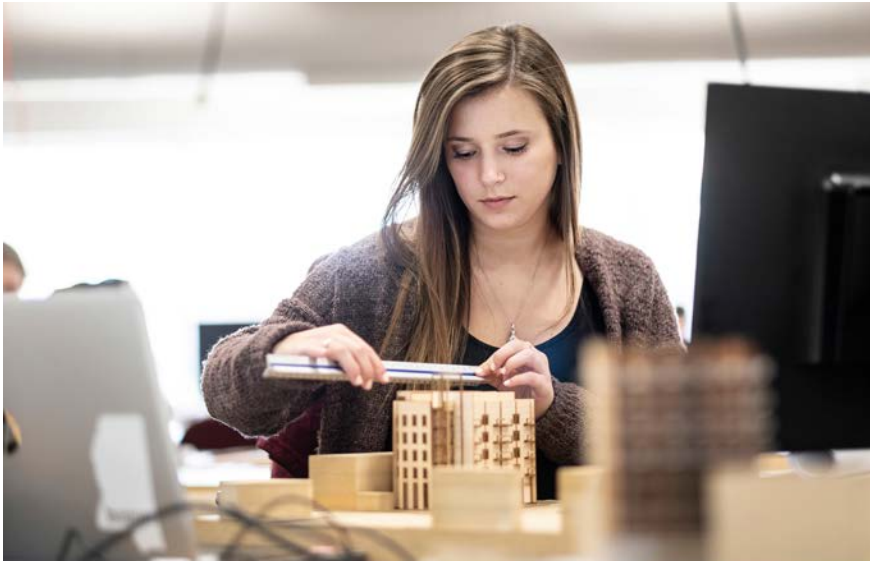
Investment analysis

All results reflect employee, student, and financial data, provided by the university, for fiscal year (FY) 2018-19. Impacts on the Mississippi economy are reported under the economic impact analysis and are measured in terms of added income. The returns on investment to students, taxpayers, and society in Mississippi are reported under the investment analysis.

*MSU helps students reach their **individual potential** and supports **economic development** across the state.*



Economic impact analysis



IMPACTS CREATED
BY MSU IN FY 2018-19

\$1.8 billion

TOTAL IMPACT

- OR -

29,016

JOBS SUPPORTED



\$297.3 million
Operations Spending Impact



\$213.1 million
Research Spending Impact



\$14.8 million
Construction Spending Impact



\$245.3 million
Extension Impact



\$32.6 million
CAVS-E Impact



\$20.8 million
Start-up & Spin-off Company Impact



\$42.5 million
Visitor Spending Impact



\$45 million
Student Spending Impact



\$935.8 million
Alumni Impact

MSU promotes economic growth in Mississippi through both its direct expenditures and through outreach and Extension programs that directly assist key industries and small businesses in Mississippi. The university serves as an employer and buyer of goods and services for its day-to-day and research operations. The Cooperative Extension Service (Extension) and the Center for Advanced Vehicular Systems Extension (CAVS-E) specialize in these outreach activities and support job creation, increased sales and revenues, and growth in the state. Numerous start-up and spin-off companies have formed as a result of programs and knowledge at MSU. The university's reputation and activities attract visitors and students from outside Mississippi, whose expenditures benefit state vendors. With 14,250 Mississippi residents enrolled, more in-state students are enrolled at MSU than any other university in the state, positioning MSU as a primary supplier of trained workers to state industries, enhancing overall productivity in the state workforce.

Operations spending impact



MSU adds economic value to Mississippi as an employer of state residents and a large-scale buyer of goods and services. In FY 2018-19, the university employed 4,169 full-time and part-time faculty and staff (not including research employees), 98% of whom lived in Mississippi. Total payroll at MSU was \$307.1 million (excluding payroll from research employees), much of which was spent in the state for groceries, mortgage and rent payments, dining out, and other household expenses. In addition, the university

spent \$80.8 million on day-to-day expenses related to facilities, supplies, and professional services (excluding research expenditures).

MSU's day-to-day operations spending added \$297.3 million in income to the state during the analysis year. This figure represents the university's payroll, the multiplier effects generated by the in-state spending of the university and its employees, and a downward adjustment to account for funding that the university received from state sources. The \$297.3 million in added income is equivalent to supporting 4,028 jobs in the state.

Research spending impact



As Mississippi's leading research university, MSU is constantly growing its research capabilities, which makes the university and the state a more attractive partner in research and development activities for both government agencies and private industry. Research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. From FY 2014-15 to FY 2017-18, MSU reported \$1.2 billion in research and development expenditures, placing the university in the top 100 nationally by the National Science Foundation. Over the last four years, MSU received 140 invention disclosures, filed 107 new patent applications, and produced 28 licenses.

In FY 2018-19, MSU spent \$141.6 million on payroll to support research activities. This, along with \$122.9 million in other research spending, created a net total of \$213.1 million in added income for the state economy. This added income is equivalent to supporting 3,306 jobs.

Construction spending impact



MSU invests in construction each year to maintain its facilities, create additional capacities, and meet its growing educational demands. In the last decade, MSU has invested more than \$900 million in campus facilities. In addition to the impact created by construction projects, the facilities themselves position MSU to remain competitive in strategic areas that are important to both the university and statewide economic development efforts. Major upgrades of the university's athletic facilities have helped drive growth in visitors to campus. While the amount varies from year to year, these quick infusions of income and jobs have a substantial impact on the state economy. In FY 2018-19,* MSU's construction spending generated \$14.8 million in added income, which is equivalent to supporting 320 jobs.

* Given the high volatility of construction expenditures from year to year, the average amount MSU spent on construction activities over the past five years was used as a proxy for the construction expenditures in FY 2018-19.

MSU research and COVID-19

Even in hard times, MSU is an economic development force in Mississippi. Even though this economic impact study is conducted for FY 2018-19, it is worth noting that most recently, MSU's research teams are working hard to find solutions to real-world problems—including preventing the spread of COVID-19.

For example, researchers in MSU's Paul B. Jacob High Voltage Laboratory answered the call from the Mississippi Institutions of Higher Learning to convert over 550 ventilators from battery power to AC power for use in the state's medical response.

CAVS-E is helping Mississippi hospitals obtain isolation gowns by connecting them with in-state manufacturers capable of making the gowns needed for treating COVID-19 patients.

The Institute for Clean Energy Technology partnered with Blue Delta Jeans to clarify face mask filtration level guidelines to improve consumer safety as this Mississippi company retools to meet the nation's needs for more personal protective equipment.

Extension impact



As a land-grant university, MSU has a long-standing history of using its expertise and resources to benefit the people of Mississippi.

MSU Extension provides direct resources and support in each of the state's 82 counties and supports every stage of growth in Mississippi's top industry—agriculture. Extension's clients include row-crop planters, forest landowners, livestock producers, families and their children, business leaders, and elected local officials.

Due to data limitations, only the impact from Extension's Agricultural and Natural Resources units are measured. The increased productivity of Mississippi farmers and ranchers from working with Extension in FY 2018-19 yielded \$245.3 million in added income for the state, which is equivalent to supporting 4,889 jobs.

It should be noted that this impact is conservative because it does not include other MSU outreach activities. For example, MSU offers a variety of opportunities for forming active, future-focused partnerships that can benefit society. Whether on campus or in the community, just down the road or around the world, MSU is creating and implementing initiatives to aid and serve others. Learning to value community engagement—and using that knowledge to become actively involved—are primary components in carrying out the university's mission of service and outreach. This value from MSU is not quantified in this report.

CAVS-E impact



MSU's CAVS-E unit provides Mississippi's manufacturers, healthcare providers, and service providers with technical expertise, professional development, and on-site consultation for product and process improvement. CAVS-E clients report that these services yield increased sales, lower costs, and improved efficiency. In FY 2018-19, CAVS-E added \$32.6 million in income to Mississippi, which is equivalent to supporting 756 jobs.

Start-up and spin-off company impact



MSU creates an exceptional environment that fosters innovation and entrepreneurship, evidenced by the number of MSU start-up and spin-off companies created in the state. Start-up companies, created specifically to license and commercialize MSU technology or knowledge, have a strong and clearly defined link to MSU. Spin-off companies, created and fostered through university programs or faculty and alumni, have a clear but weaker link to MSU. Efforts are continuously made to keep start-up and other companies in Mississippi by providing office spaces specifically geared toward new businesses in the Thad Cochran Research, Technology, and Economic Development Park.

An innovation and economic prosperity university

Although data limitations prevent a full accounting of MSU's outreach activities, the university is recognized for its commitment to supporting innovation and economic activity. Since 2015, MSU has been designated as an Innovation and Economic Prosperity University by the Association of Public and Land Grant Universities. The designation—attained after a rigorous review process—recognizes MSU for working to advance engagement and economic well-being in the state, region and nation.

Preparing future entrepreneurs

Located in the heart of MSU's campus, MSU's Center for Entrepreneurship and Outreach strives to help students, faculty, and staff at MSU start and grow successful companies. The Center for Entrepreneurship and Outreach supports over 100 student start-up teams every year as they work to launch a new business. Through these efforts, MSU aggressively seeks to unify, grow, and foster culture of entrepreneurship at MSU in the local community and throughout the state.

In FY 2018-19, MSU start-up and spin-off companies added \$20.8 million in income to the Mississippi economy, which is equivalent to supporting 293 jobs. Of this added income, \$15.2 million was due to the start-up companies, with the remainder due to spin-off companies.

Visitor spending impact



Hundreds of thousands of visitors from outside the state were attracted to MSU during the analysis year to attend commencement, sports events, and other activities sponsored by the university. While in the state, visitors spent money for lodging, food, transportation, and other personal expenses. The off-campus expenditures of the university's out-of-state visitors generated a net impact of \$42.5 million in added income for the state economy in FY 2018-19. This \$42.5 million in added income is equivalent to supporting 1,285 jobs.

Student spending impact



Around 26% of students attending MSU originated from outside the state in FY 2018-19, and some of these students relocated to Mississippi to attend MSU. These students may not have come to the state if the university did not exist. In addition, some in-state students, referred to as retained students, would have left Mississippi if not for the existence of MSU. While attending the university, these relocated and retained students spent money on groceries, accommodation, transportation, and other household expenses. This spending generated \$45 million in added income for the state economy in FY 2018-19, which supported 1,115 jobs in Mississippi.

Alumni impact



The education and training MSU provides for state residents has the greatest impact. Since its establishment, students have studied at MSU and entered the state workforce with greater knowledge and new skills. Today, thousands of former MSU students are employed in Mississippi. As a result of their MSU educations, the students receive higher earnings and increase the productivity of the businesses that employ them. In FY 2018-19, MSU alumni generated \$935.8 million in added income for the state economy, which is equivalent to supporting 13,024 jobs.

Total impact

MSU added \$1.8 billion in income to the Mississippi economy during the analysis year, equal to the sum of the operations, research, and construction spending impacts; the Extension and CAVS-E impacts; the start-up and spin-off company impact; the visitor and student spending impacts; and the alumni impact. For



Actively meeting the state workforce demands

Seeking to close the skills gap for qualified software development programmers in the state, MSU is partnering with telecommunications company C Spire to create hundreds of new student academic and computer science career opportunities.

With Mississippi's only accredited programs in veterinary medicine and architecture, MSU is the state's primary source of professionals in these fields. MSU is also a leading source of individuals with degrees in agriculture and engineering.

MSU also offers the state's only petroleum engineering degree program in response to a high demand from industry for graduates with experience in drilling, production, petroleum economics, and reservoir engineering.

context, the \$1.8 billion impact was equal to approximately 1.6% of the total gross state product (GSP) of Mississippi.

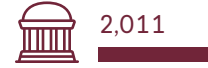
MSU's total impact can also be expressed in terms of jobs supported. The \$1.8 billion impact supported 29,016 state jobs, using the jobs-to-sales ratios specific to each industry in the state. This means that one out of every 55 jobs in Mississippi is supported by the activities of MSU and its students. In addition, the \$1.8 billion, or 29,016 supported jobs, stemmed from different industry sectors. Among non-education industry sectors, MSU's spending and alumni in the Agriculture, Forestry, Fishing, & Hunting industry sector supported 5,608 jobs in FY 2018-19. These are impacts that would not have been generated without the university's presence in Mississippi.

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MSU IMPACTS BY INDUSTRY
(JOBS SUPPORTED)



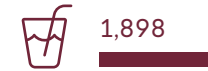
Agriculture, Forestry, Fishing, & Hunting



Government, Non-Education



Health Care & Social Assistance



Accommodation & Food Services



Professional & Technical Services





Investment analysis



An investment analysis evaluates the costs associated with a proposed venture against its expected benefits. If the benefits outweigh the costs, then the investment is financially worthwhile. The analysis presented here considers MSU as an investment from the perspectives of students, taxpayers, and society in Mississippi.

Student perspective

MSU offers a high return on investment for students, who receive higher career earnings and more professional opportunities as a result of their education. In FY 2018-19, MSU served 24,251 credit and 5,318 non-credit students. In order to attend the university, the students paid for tuition, fees, books, and supplies. They also took out loans and will incur interest on those loans. Additionally, students gave up money they would have otherwise earned had they been working instead of attending college. The total investment made by MSU's students in FY 2018-19 amounted to a present value of \$449.8 million, equal to \$205.4 million in out-of-pocket expenses (including future principal and interest on student loans) and \$244.3 million in forgone time and money.

In return for their investment, MSU's students will receive a stream of higher future earnings that will continue to grow throughout their working lives. For example, the average MSU bachelor's degree graduate from FY 2018-19 will see annual earnings that are \$19,400 higher than a person with a high school diploma or equivalent working in Mississippi. Over a working lifetime, the

STUDENTS SEE A HIGH RATE OF RETURN FOR THEIR INVESTMENT IN MSU



13.8%

Average annual return for MSU students



9.9%

Stock market 30-year average annual return

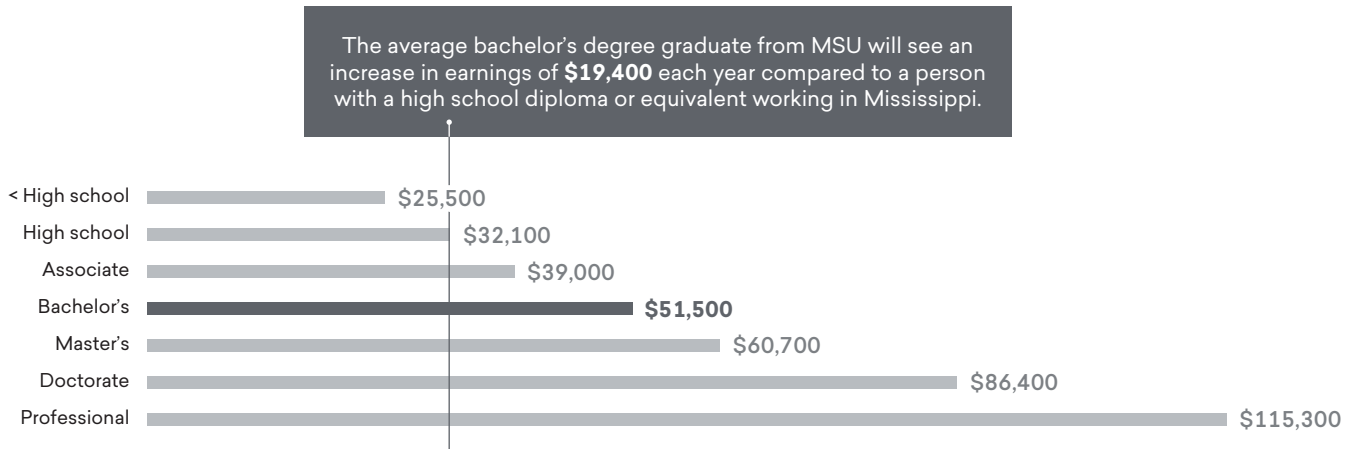


0.8%

Interest earned on savings account (National Rate Cap)

Source: Forbes' S&P 500, 1989-2018. FDIC.gov, 6-2019.

benefits of the bachelor's degree over a high school diploma will amount to an undiscounted value of \$853.6 thousand in higher earnings per graduate. The present value of the cumulative higher future earnings that MSU's FY 2018-19 students will receive over their working careers is \$1.5 billion.



Source: Emsi employment data.

The students' benefit-cost ratio is 3.3. In other words, for every dollar students invest in MSU, in the form of out-of-pocket expenses and forgone time and money, they will receive a cumulative value of \$3.30 in higher future earnings. Annually, the students' investment in MSU has an average annual internal rate of return of 13.8%, which is impressive compared to the U.S. stock market's 30-year average rate of return of 9.9%.

Taxpayer perspective



Taxpayer investments in MSU pay dividends for the state through increased revenue and the opportunities created by the university's educational, research, and outreach efforts. MSU generates more in tax revenue than it takes. These benefits to taxpayers consist primarily of taxes that the state and local government will collect from the added revenue created in the state. As MSU students will earn more, they will make higher tax payments throughout their working lives. Students' employers will also make higher tax payments as they increase their output and purchases of goods and services. By the end of the FY 2018-19 students' working lives, the state and local government will have collected a present value of \$393.6 million in added taxes.

Benefits to taxpayers will also consist of savings generated by the improved lifestyles of MSU students and the corresponding reduced government services. Education is statistically correlated with a variety of lifestyle changes. Students' MSU educations will generate savings in three main categories: 1) healthcare, 2) crime, and 3) income assistance. Improved health will lower

*For every dollar of public money invested in MSU, taxpayers will receive a cumulative value of **\$2.30** over the course of the students' working lives.*

students' demand for national health care services. In addition, students will be less likely to interact with the criminal justice system, resulting in a reduced demand for law enforcement and victim costs. MSU students will be more employable, so their reduced demand for income assistance such as welfare and unemployment benefits will benefit taxpayers. For a list of study references, contact the university for a copy of the main report. Altogether, the present value of the benefits associated with an MSU education will generate \$99.8 million in savings to state and local taxpayers.

In addition to the taxpayer benefits calculated in this report, MSU benefits taxpayers by using university expertise and resources to support the needs of state agencies. For example, MSU is home to the Mississippi State Chemical Laboratory, which supports the Mississippi Department of Agriculture and Commerce by providing the analytical data to ensure the quality, accurate labeling, and safety of all fertilizers, animal feeds, human foods, pesticides, and petroleum products sold in the State of Mississippi.

Total taxpayer benefits quantified in this study amount to \$493.4 million, the present value sum of the added taxes and public sector savings. Taxpayer costs are \$212.1 million, equal to the amount of state and local government funding MSU received in FY 2018-19. These benefits and costs yield a benefit-cost ratio of 2.3. This means that for every dollar of public money invested in MSU in FY 2018-19, taxpayers will receive a cumulative value of \$2.30 over the course of the students' working lives. The average annual internal rate of return for taxpayers is 7.2%, which compares favorably to other long-term investments in the public and private sectors.

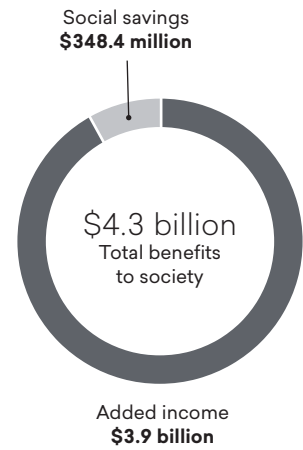
Social perspective



Society as a whole in Mississippi benefits from the presence of MSU in two major ways. Primarily, society benefits from an increased economic base in the state. This is attributed to higher student earnings and increased business output, which raise economic prosperity in Mississippi.

Benefits to society also consist of the savings generated by the improved lifestyles of MSU students. As discussed in the previous section, education is statistically correlated with a variety of lifestyle changes that generate social savings. Note that these costs are avoided by the consumers but are distinct from the costs avoided by the taxpayers outlined above. Healthcare savings include avoided medical costs associated with smoking, alcohol dependence, obesity, drug abuse, and depression. Savings related to crime include reduced security expenditures and insurance administration, lower victim costs, and reduced expenditures by the criminal justice system. Income assistance savings include reduced welfare and unemployment claims. For a list of study references, contact the university for a copy of the main report.

SOCIAL BENEFITS IN MISSISSIPPI FROM MSU



MSU's benefits beyond the state

Not quantitatively measured in this analysis but nonetheless important is MSU's work on solving hunger and poverty. MSU researchers are using unmanned aerial systems, advanced irrigation techniques, and other technologies to help Mississippi farmers increase crop yields. Although they're unable to travel right now, scientists in the Fish Innovation Lab continue work with MSU's partners in developing countries to keep projects on track designed to help small farming communities feed themselves and be more resilient in surviving pandemics like COVID-19.

Altogether, the social benefits of MSU equal a present value of \$4.3 billion. These benefits include \$3.9 billion in added income through students' increased lifetime earnings and increased business output, as well as \$348.4 million in social savings related to health, crime, and income assistance in Mississippi. People in Mississippi invested a present value total of \$996.4 million in MSU in FY 2018-19. The cost includes all the university and student costs.

The benefit-cost ratio for society is 4.3, equal to the \$4.3 billion in benefits divided by the \$996.4 million in costs. In other words, for every dollar invested in MSU, people in Mississippi will receive a cumulative value of \$4.30 in benefits. The benefits of this investment will occur for as long as MSU's FY 2018-19 students remain employed in the state workforce.



Summary of investment analysis results

The results of the analysis demonstrate that MSU is a strong investment for all three major stakeholder groups—students, taxpayers, and society. As shown, students receive a great return for their investments in an MSU education. At the same time, taxpayers' investment in MSU returns more to government budgets than it costs and creates a wide range of social benefits throughout Mississippi.



STUDENT PERSPECTIVE

\$1.5 billion
Present value benefits

\$449.8 million
Present value costs

\$1 billion
Net present value

Benefit-cost ratio Rate of return

3.3

13.8%



TAXPAYER PERSPECTIVE

\$493.4 million
Present value benefits

\$212.1 million
Present value costs

\$281.3 million
Net present value

Benefit-cost ratio Rate of return

2.3

7.2%



SOCIAL PERSPECTIVE

\$4.3 billion
Present value benefits

\$996.4 million
Present value costs

\$3.3 billion
Net present value

Benefit-cost ratio Rate of return

4.3

n/a*

* The rate of return is not reported for the social perspective because the beneficiaries of the investment are not necessarily the same as the original investors.

Conclusion

The results of this study demonstrate that MSU creates value from multiple perspectives. The university benefits state businesses by increasing consumer spending in the state and supplying a steady flow of qualified, trained workers to the workforce. MSU enriches the lives of students by raising their lifetime earnings and helping them achieve their individual potential. The university benefits state and local taxpayers through increased tax receipts and a reduced demand for government-supported social services. Finally, MSU benefits society as a whole in Mississippi by creating a more prosperous economy and generating a variety of savings through the improved lifestyles of students.

About the study

Data and assumptions used in the study are based on several sources, including the FY 2018-19 academic and financial reports from MSU, industry and employment data from the U.S. Bureau of Labor Statistics and U.S. Census Bureau, outputs of Emsi's Multi-Regional Social Accounting Matrix model, and a variety of studies and surveys relating education to social behavior. The study applies a conservative methodology and follows standard practice using only the most recognized indicators of economic impact and investment effectiveness. For a full description of the data and approach used in the study, please contact the university for a copy of the main report.

The results of this study demonstrate that MSU creates value from
multiple perspectives.



Emsi is a labor market analytics firm that integrates data from a wide variety of sources to serve professionals in higher education, economic development, workforce development, talent acquisition, and site selection. Emsi is a leading provider of economic impact studies and labor market data to educational institutions in the U.S. and internationally. Since 2000, Emsi has completed over 2,000 economic impact studies for institutions across three countries. For more information about Emsi's products and services, visit www.economicmodeling.com.