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IMPACTS OF MACOMB COMMUNITY COLLEGE ON THE ECONOMY OF MACOMB COUNTY

INTRODUCTION

Macomb Community College (MCC) is a sizeable institution across a number of dimensions. Its enrollment totals more than 50,000 students, about half of which are in credit-bearing programs.¹ It offers nearly 200 training/education programs with a faculty and support staff of approximately 2,000 professionals. Its four campuses comprise over 40 buildings and a footprint of over 400 acres. Its 2011/2012 budget was approximately \$125 million. Equally important, the college provides cultural opportunities for students and county residents alike. The Macomb Center for the Performing Arts provides a venue for concerts and professional stage productions, and the Lorenzo Cultural Center offers a showcase for multi-dimensional art, cultural, and historical experiences.

Undoubtedly, MCC significantly contributes to the vitality and the quality of life in Macomb County. The purpose of this report is to document the college's economic contributions to the county. We first present an estimate of the economic presence of MCC. This is essentially the level of economic transactions that occur in a year due to the provision of coursework and other learning opportunities to students in exchange for tuition and fees, and due to the employment of faculty and staff as well as the economic spinoffs that occur from these direct transactions.

Next we present an estimate of the economic impact of MCC on Macomb County. Estimating economic impact is a conceptual exercise that involves making valuations of the status quo compared to a counterfactual situation in which the college is absent from the county. If one wanted to estimate the economic impact of a new facility in an area, then it seems straightforward and logical to compare the area's economy before the facility arrives to the economy after the facility is operational. To estimate the economic impact of an existing facility in an area, we compare the area's economy with the facility to the area's economy without the facility.

The third part of the report supplements the economic impact estimates by projecting the loss in productivity and earnings that would occur if the county did not house MCC. In other words, it estimates the loss in earnings that would accompany the loss in skills and knowledge (i.e., human capital) in the counterfactual situation of having no local community college. The fourth section of the report addresses the effects of the presence of the community college on property values (residential and non-residential) and the county's tax base. The final section presents conclusions.

In the appendix, we present an economic impact estimate of the college's planned \$56 million renovation construction.

¹ In this report, the total unduplicated enrollment count at the college—35,097 students—is used in calculating its economic impact.

ECONOMIC PRESENCE

The economic presence of MCC is defined as the level of economic activity in the county that is supported by the existence of the college. As discussed further below, it includes the college's operational expenditures and the consumer expenditures of its staff, faculty, and students.

To measure both the economic presence and the college's economic impact, we used an economic impact model that was constructed for Macomb County by Regional Economics Models, Inc. (REMI) at the request of the Institute. The model is unique; it integrates the standard input-output model used in most economic impact studies with a computable general equilibrium model. It is widely used across the U.S. and in Europe as well. The model is particularly suited to measure the economic impact of higher education institutions because:

- It contains a highly detailed breakdown of expenditures made by higher education institutions. Other models use a more general breakdown that include expenditures made by all education institutions including K–12 public and private schools.
- It allows for estimating the unique consumption expenditures made by students and the college's faculty and staff.
- Finally, it includes a residential component that allows for the modeling of the impact of students, faculty, and staff staying in the county and working outside the county. Other models mistakenly assume that once an employer has left the county, all of the workers would leave as well.

In estimating the economic value of the college's presence in the county, we included the college's ongoing operational budget of \$125 million in expenditures and an estimated \$74.2 million in annual consumer expenditures including books and meals of the college's unduplicated count of 35,000 students.² Offsetting these positive expenditures, we deducted the \$34 million the college receives from local property taxes.

Table 1 displays the estimates derived from the REMI model. The ongoing operations of MCC support 577 jobs in Macomb County outside of the college. Often an employment multiplier is calculated to illustrate the total employment impact of a facility. The multiplier is derived by dividing the total employment impact of the facility, in this case: 2,566, by the facility's direct employment, 1,989. The multiplier for the college's ongoing operation is 1.3. In other words, every 10 employees at the college support another 3 jobs in the county.

² This estimate is based on the article by Geoffrey D. Paulin "Expenditures of College-Age Students and Nonstudents," *Monthly Labor Review*, July 2001, pp. 46–50. He found that in the 1996–1998 period, college students spent \$2,584 per quarter. In our calculations, we subtracted housing expenditures from this total since we assume many MCC students live at home and used an inflation factor of 43.2 percent. Finally, we assumed that MCC students attended three quarters of instruction.

In addition to the jobs created by the operations of MCC, the student expenditures are estimated to create 367 jobs, the plurality of which are in retail trade and health care.

At the same time without the college, property taxes would be lowered in the county. In 2011/2012, \$36.5 million was collected in local property taxes to support the college's operations. Without the college, this sum would be returned to the county residents and businesses. The reduction in property taxes for residents would have a positive impact on consumption expenditures. For businesses, the decrease in property taxes would lower their capital costs on plant and equipment, making the county marginally more cost competitive. As shown in Table 1, the combined impact to residents and businesses of the lower property taxes would generate an estimated 261 jobs. Since this is an offsetting impact to the college's economic presence, it is entered as a negative impact.

Table 1 Economic Presence of Macomb Community College on Macomb County in 2012

	Operations	Student expenditures	MCC millage	Total
Employment				
College employment	1,989			1,989
Indirect	577	367	-261	683
Total	2,566	367	-261	2,672
Earnings by place of work (\$)				
Personal income (\$)	84,278	9,638	-8,339	85,577
Gross regional product (\$)	74,468	22,665	-18,898	78,236
Industry Impact Employment				
Construction	113	12	-54	71
Wholesale trade	15	12	-6	20
Retail trade	94	94	-41	147
Real estate and rental	37	17	-19	34
Administrative	43	16	-14	45
Healthcare	81	92	-44	129
Accommodation and food	37	30	-17	50
Government	54	17	-15	56
Other	103	78	-51	130

NOTE: Monetary entries in the table are in \$000s. Employment estimates are "job-years." The bottom panel of the table displays the industrial distribution of the Indirect Employment. Except for rounding error, the column sum of these entries will equal the Indirect Employment given in the upper panel.

The table shows that 2,672 persons are estimated to be employed in Macomb County due to the presence of the college. County workplace earnings are up by more than \$150 million and personal income of the county residents is enhanced by \$85.6 million due to MCC.³ Finally, Macomb County's Gross Regional Product, which is a measure of value of all goods and services generated in the county, is increased by \$78.2 million.

The supported employment in the county is spread out among a wide range of industries. The 113 construction jobs include those on the college's campus as well as elsewhere throughout

³ Personal income is lower than workplace earnings, in part, because many individuals who work in the county reside outside the county.

the county.⁴ From 2006 to 2010, capital expenditures at the college totaled nearly \$75 million. Combined retailers and health care providers employ more than 270 individuals due to the presence of the college in the county.

ECONOMIC IMPACT

The economic impact of the college estimates the changes in economic activities in the county that are due to the presence of the college. This depends on identifying the most likely consequences to the college's current student body and staff if the college simply did not exist. In short, the economic impact is an effort to measure the difference between the economy with Macomb Community College and one without the college. To estimate its economic impact, we must estimate what would take its place in the county, if anything, and what would happen to its current students, faculty, and staff.

In the case of a major manufacturing plant closing, the most likely event would be that the plant would not be replaced and its jobs and payroll would be lost to the community. In fact, the impacted community is often left with a blighted, abandoned structure for many years. On the opposite end of the scale, the closure of a restaurant or a retail outlet is often caused by or followed by the opening of another competing facility. The net impact is close to zero. Retail outlets and restaurants depend on the local purchasing power of a local area that can only support a certain number of retail establishments.

In preparing the economic impact of Macomb Community College, we made a number of assumptions to derive two scenarios:⁵

- If the county lacked a community college, it would clearly suggest the lack of financial support of the county's residents and businesses for a community college. Therefore, it is unlikely that another community college would open in the county.
- This assumption is also supported by the existence of four community colleges within an easy commute distance to Macomb County residents: Wayne Community College, Henry Ford Community College, Schoolcraft Community College, and Oakland Community College.
- Without Macomb Community College, its current students would have to decide whether to discontinue their education or further their education at one of the surrounding community colleges. We developed two possible scenarios. In the first scenario, which

⁴ For construction, it is important to note that the jobs estimates in this report are "year-long jobs" which means that four, three-month construction jobs equal one year-long job.

⁵ An alternative scenario was seriously considered. Due to Macomb County's population base—840,000 residents—it is likely that another community college or branch(es) from surrounding community colleges would open in the county. In this scenario, only the unique programs of the college would be lost. These include the culinary arts programs, many of its information technology programs, and international and global studies programs. In addition, the programs at the University Center would also be discontinued. Unfortunately, there is insufficient information on the enrollment and size of these impacted programs to carry out this scenario.

we refer to as the higher attendance scenario, we assume that 90 percent of the students would choose to attend a neighboring community college and pay the higher out-of-district tuition and fees. In the second scenario, the lower attendance scenario, we assume that 60 percent would attend a neighboring college because of the higher tuition costs as well as the costs associated with commuting, and/or because surrounding colleges do not offer the courses that the student is interested in pursuing.

- With the expanding enrollment at the surrounding community colleges, we also assume that 50 percent of Macomb Community College’s faculty and staff would be able find employment at one of the surrounding expanding colleges. However, we also assumed that they would also suffer a 20 percent reduction in wages and salaries.

In estimating the college’s economic impact we start with its derived economic presence (Table 1) which reflects the current scenario, and then estimate:

1. **Faculty and staff remaining** – This is the impact of the 50 percent of the college’s staff finding employment at one of the expanding neighboring community colleges at reduced wages and continuing to reside in the county. By continuing to reside in the county, these individuals, through their consumer expenditures, would offset some of the impact of the absence of the college. As shown in Table 2, the impact of these individuals staying in the county is subtracted from the college’s economic presence estimate. It is important to note that although these individuals would remain employed, they are no longer employed in the county and, therefore, are not counted in the county’s employment numbers.
2. **A student adjustment** – This is the economic impact from changes in expenditure patterns of students in the absence of a community college in the county. The 60 or 90 percent of the MCC students who decide to further their education at a neighboring community college will have to pay, on average, an estimated \$1,474 more in tuition and fees annually.⁶ This is the loss of income suffered by each student because they have chosen to attend an out-of-county community college. This can be considered as a cost saving to the county’s residents because MCC is located in the county, and is added to the college’s economic presence.

On the other hand, while it may be an unfortunate circumstance for the 10 or 40 percent of the students to not pursue a college education, it means that their tuition and college-related consumer expenditures would be diverted to other consumer expenditures that would stay in the county. These consumer expenditures would generate a positive short-term, offsetting impact on the county’s economy, which is similar to the impact of the percentage of faculty and staff staying in the county. Likewise, since it is an offsetting impact, the resulting consumer expenditure of the college students staying in county but not going to school would be subtracted from the college’s economic presence estimates.

⁶ This is an average of the extra tuitions and fees that full-time students would have to pay to attend one of the following community colleges: Henry Ford (\$2,098), Schoolcraft (\$1,580), Wayne County (\$992) and Oakland County (\$1,227). The estimated additional cost of attending college in a neighboring community is pro-rated for part-time students as well.

As shown in Table 2, the economic and employment impacts of 50 percent of the college's faculty and staff staying in the county are expressed as negative numbers. If 50 percent of the college's staff were to remain in the county at reduced salaries, 84 jobs would be retained in the county.

Table 2 Economic Impact of Macomb Community College on Macomb County in 2012

	Economic presence	Faculty and staff remaining	Students adjustment		Total economic impact	
			Higher attendance scenario	Lower attendance scenario	Higher attendance scenario	Lower attendance scenario
Employment						
College employment	1,989				1,989	1,989
Indirect	683	-84	66	-208	665	391
Total	2,672	-84	66	-208	2,654	2,380
Earnings by place of work (\$)						
Personal income (\$)	150,342	-3,874	3,061	-9,596	149,529	136,872
Gross regional product (\$)	85,577	-16,117	12,741	-39,907	82,201	29,553
	78,236	-5,219	4,129	-12,924	77,146	60,093
Industry Impact Employment						
Construction	71	-8	7	-20	69	43
Wholesale trade	20	-3	2	-6	20	12
Retail trade	147	-20	16	-49	143	78
Real estate and rental	34	-4	3	-10	34	20
Administrative	45	-4	3	-9	44	33
Healthcare	129	-19	15	-47	125	63
Accommodation and food	50	-6	5	-16	49	28
Government	56	-4	3	-10	55	42
Other	130	-17	13	-42	127	72

NOTE: Monetary entries in the table are in \$000s. Employment estimates are "job-years." The bottom panel of the table displays the industrial distribution of the Indirect Employment. Except for rounding error, the column sum of these entries will equal the Indirect Employment given in the upper panel.

For the college's students, the impact is more complicated. If 90 percent of the college's students undertake their education at a neighboring school, the loss of income due to higher tuition payments more than offsets the increase in county spending of the 10 percent of students who selected not to attend college. Therefore, the impact is slightly positive—66 jobs. However, if 40 percent of the college's students decide to not to attend college due to the absence of Macomb Community College, then the gain to the county of their increased expenditures would more than offset the loss of income suffered by the 60 percent who continued their education at a neighboring college. In net, 208 jobs would be retained in the county. These impacts are subtracted from the college's overall impact to the county to derive its net economic impact.

As shown in Table 2, the employment impact of Macomb Community College on Macomb County in 2012 is between 2,380 and 2,654 jobs. If the college did not exist, in addition to its nearly 2,000 employees, the county would lose between 665 jobs and 391 jobs across a wide range of industries. The college's impact on county wages earnings ranges from \$150 million to \$137 million. The college impact on the area's personal income is not as great because

a large percent of the college's faculty and staff and students are expected to remain in the county. The college's economic impact on county personal income ranges between \$30 million and \$82 million. Finally, the economic impact of the college on the county's Gross Domestic Product—the value of all goods and services produced in the county—ranges from \$60 million to \$77 million.

The economic presence of MCC and its economic impact are sizeable. However, we would add a caveat that these estimates are extremely conservative because they do not include the impact of the higher educational attainment that would be absent in the counterfactual thought experiment of no MCC. The next section of the report analyzes the impact on the future earnings of its 35,000 (unduplicated count of) students attending classes at the college or at its University Center.

HUMAN CAPITAL IMPACT

For the most part, the motivation for students to attend MCC is to obtain skills and knowledge that will pay off for them in the form of better paying jobs and meaningful careers. Many studies have provided empirical estimates of the impact of community college attendance on earnings. For this study, we rely on estimates from Bailey, Kienzl, and Marcotte (2004).⁷ Their main results are as follows:

- For women who start a certificate program, earning a certificate or completing a year of course work without earning a credential imparts a 16 percent earnings advantage over women with just a high school diploma. For men who start a certificate program, however, there is no statistically significant earnings advantage over a high school diploma whether or not a certificate is actually earned.
- For women who start an occupational associate degree program, earning an associate degree conveys a 39 percent earnings advantage over a high school degree. For men, there is a 16 percent earnings advantage.
- For women who start an occupational associate degree program, but who do not get a degree, there is a 10 percent earnings advantage over a high school degree, and for men who do not earn an associate degree, there is a six percent earnings advantage.
- For academically or economically disadvantaged students, there is an earnings advantage for attending a community college whether or not a degree or certificate is earned for males, but women only benefit from a degree.

We combined these estimates with actual median earnings for Macomb County residents aged 25 to 34 from the 2010 Census of Population. In particular, the Census data showed that

⁷ Bailey, Thomas; Gregory Kienzl, and Dave E. Marcotte, "The Return to a Sub-Baccalaureate Education: The Effects of Schooling, Credentials and Program of Study on Economic Outcomes." Report prepared for the National Assessment of Vocational Education, U.S. Department of Education, August 2004.

individuals whose highest level of education was an associate degree had median earnings of \$31,000, and individuals whose highest level of education was a high school diploma had median earnings of \$26,000. The Census did not collect data for certificate earners, so we made the assumption that individuals who had earned a certificate would have median earnings halfway between high school and an associate degree, or \$28,500.

Having MCC in the county is advantageous to employers and county residents who are potential members of the workforce for at least two reasons. First, the college imparts skills and knowledge that enhance workers' productivity and employability. Second, it tends to retain workers in the county. Many local employers interact with the college through internships, advisory committees, or in other ways, which promotes the hiring of MCC students and simultaneously promotes the retention of county residents by providing good employment opportunities within the county.

We used the two scenarios described above in estimating the college's economic impact to estimate the human capital impact of MCC in terms of employment retention and in terms of skill enhancement. The difference between the two scenarios is that in one, we have assumed that a large fraction of students (90 percent) would pursue their community college course work at an alternative institution, and in the other scenario, we have assumed that 60 percent would do so. In both scenarios, we have assumed that the students who would not pursue their education without a local institution would be disproportionately educationally or economically disadvantaged. Consequently, we have assumed a higher credential earning rate among those who would choose to pursue their education outside of the county. Our assumption is that it would be 20 percent (15 percent associate degrees and 5 percent certificates). Our assumption about what the credential earning rate would have been for students who would not pursue their education elsewhere is 12 percent (9 percent for associate degrees and 3 percent for certificates).

Table 3 presents the human capital impacts. The first two columns of results pertain to the first scenario, and the last two columns pertain to the second scenario. The former scenario assumes that MCC educates over 31,000 individuals who would otherwise choose to attend a community college in another county if the MCC opportunities did not exist. Clearly many of MCC's students find employment in and choose to live in Macomb County. But for purposes of this calculation, we have assumed that for 10 percent of the 31,000 students (i.e., over 3,100), the presence of MCC has resulted in the choice to live and work in Macomb County whereas they would have opted to live and work in another county if they had attended an institution outside Macomb County. We offset the earnings of these individuals by 80 percent under the assumption that in the absence of those more than 3,100 workers, employers would have filled 80 percent of their positions with county residents.

The specific estimates in the first column of table 3 were estimated as follows. In this scenario, the assumption was made that 90 percent of the degree-pursuing students would attend alternative institutions outside of Macomb County if MCC was not an option. A further assumption was made that ten percent of those 31,500 students would be enticed to live and receive earnings in an alternative county. The first step was to calculate the loss to the county from these students. With our completion rate assumptions, this means a loss to Macomb County of 472.5 associate degree earners who would have averaged \$31,000 in annual earnings (\$14.65

million), 157.5 certificate earners who would have earned \$28,500 per year (\$4.489 million), and 2,520 individuals with course work, but no degree who would have earned \$28,000 per year (\$70.56 million). The second step was to calculate the offset to these losses because Macomb County employers would hire others, and in particular, we have assumed that 80 percent of those others would be new residents to the county. Therefore the entries in the first column are 20 percent of the losses.

In addition to the employment retention impact, there is a skill enhancement impact of MCC. This refers to the fact that the presence of MCC increases the educational credentials of a share of individuals who would not attend an alternative if it were not available. We have assumed that these individuals would earn the same as an individual whose highest level of education is a high school diploma.

The calculation of the second scenario is identical to the first, except that it assumes that only 60 percent of students would choose to attend another institution in lieu of MCC instead of 90 percent. The employment retention impact is much smaller because a smaller share of students is assumed to attend an alternative institution and therefore be subject to the opportunity of working and living in another county. On the other hand, the skill enhancement impact is much larger because four times as many students would settle for the employment opportunities open to individuals whose highest level of education is a high school diploma.

The total estimated human capital impacts are \$26.330 million and \$43.762 million for the scenarios with 90 percent of student attending an alternative institution and with 60 percent, respectively.

Table 3 Human Capital Impacts

Credential	Scenario 1		Scenario 2	
	90 percent attend alternative institution		60 percent attend alternative institution	
	Employment retention impact	Skill enhancement impact	Employment retention impact	Skill enhancement impact
Associate degree	\$2.930	\$1.595	\$1.953	\$6.300
Certificate	0.898	0.263	0.599	1.050
No credential	14.112	6.552	9.408	24.461
TOTAL	\$17.940	\$8.390	\$11.951	\$31.811

NOTE: Table entries are in \$ million. The Employment Retention Impact is attributed to individuals who would choose to work and live in Macomb County because of the presence of Macomb Community College, whereas they would work and live outside of the county if MCC did not exist. It assumes that 10 percent of the individuals who would attend an alternative institution if MCC was not in existence become employed and live outside of Macomb County and only 80 percent of the job opportunities that they would have had are filled by new or existing residents of Macomb County. The Skill Enhancement Impact refers to the increased levels of earnings of individuals because of the skills and credentials earned at MCC that would not have been earned if MCC did not exist because the individuals would not attend an alternative institution.

REAL PROPERTY VALUE IMPACTS

Having a public institution of higher education in one's community is an amenity. For students who choose to attend, it provides subsidized courses of instruction that may lead to a credential, both of which—course work and credential—are valued in the labor market. Furthermore, it provides all residents with cultural and artistic opportunities, and for community members who take advantage of them, such institutions usually offer community interest courses and activities. Finally, institutions of higher education usually have considerable “green space” and, oftentimes, interesting architecture that enhances the physical appearance of the locality.

On the other side of the ledger, however, the presence of an institution of higher education may cause traffic congestion if it has a substantial number of commuters, excessive noise from students, or deteriorating housing if the institution attracts young renters.

Both the amenities and the disamenities will affect property values. Vandegrift, Lockshiss, and Lahr (2009)⁸ provide empirical estimates of the effects of the presence of an institution of higher education on property values and tax base. Under the assumption that the parameters from this study hold for Macomb Community College, we estimate that the presence of the college has a minimal effect on residential property values, but it increases commercial and industrial property values by about 13.5 percent. The lack of an impact on housing prices comes from offsetting effects—having a community college increases property values—but when enrollment exceeds 15,000 students, the residential property values are hurt by the disamenities caused by so many students.

According to the Michigan Department of Treasury State Tax Commission, the 2011 Taxable Valuation of Commercial and Industrial Real Property in Macomb County is \$5.485 billion. Assuming that the aforementioned study's parameters hold true for Macomb County, then 13.5 percent of that value (or \$740 million) can be attributed to the presence of MCC.

CONCLUSIONS

- Macomb Community College (MCC) serves the educational needs of thousands of Macomb County residents and is an important center of learning and culture for the county. It is also a significant contributor to the economic vitality of the county. If the county's economy was thought of as a pie, the size of the slice that is due to the presence of MCC is almost \$85.6 million in annual personal income and over \$78.2 million in annual gross regional product in Macomb County.
- The economic impact of MCC measures how much larger the Macomb County economic pie is due to the community college. We developed two scenarios for the

⁸Vandegrift, Donald, Amanda Lockshiss, and Michael L. Lahr, “Town Versus Gown: The Effect of a College on Housing Prices and the Tax Base,” MPRA Paper No. 18998, July 7, 2009 (online at <http://mpra.ub.uni-muenchen.de/18998/>).

county, one with the MCC and the other without the college. We estimate that the pie is between \$30 million and \$82 million larger in personal income and between \$60 million and \$77 million larger in gross regional product due to college.

- The human capital impact of MCC refers to the increase in earnings of county residents because of the enhanced skills of the workforce that are gained with pursuit of course work and attainment of credentials. In our two scenarios, we estimate that this impact would be between \$43.8 million and \$26.3 million.
- Summing the economic and human capital impacts suggests that MCC's impact on the Macomb County economy is between approximately \$74 million and \$108 million annually.
- County residents annually pay approximately \$34 million in property taxes to support MCC, so their return on investment is between \$2.18 and \$3.18 for each dollar of taxes they pay.
- The presence of a community college with its learning and cultural activities as well as ample "green" space is an amenity for county residents and property owners. Using estimates from the literature, we calculate that this amenity value results in an increase in the county tax base of approximately \$740 million due to the presence of MCC.

APPENDIX

Economic Impact of the Planned \$56 Million in Renovation Construction at Macomb Community College

The planned \$56 million in renovation construction at MCC will generate a positive short-term impact to the Macomb County economy. However, all of this impact will be erased in the later years as the county's residents and businesses pay off the ten-year construction bond. Of course, this is an incomplete analysis because it does not take into consideration the positive impact of the training and education activities that the renovation will allow. Moreover, it does not include the potential increase in productivity that renovations will generate as they will enhance the usage of the existing facilities.

In preparing the economic impact of the planned \$56 million renovation construction project, the following assumptions were applied:

- Construction activity is spread out evenly over four years: 2013–2016.
- The annual interest rate on the bond will be 4.5 percent, which will require an annualized payment of \$7.08 million to pay off the loan in 10 years.
- Bond payments will be divided between the county's homeowners, 32 percent, and businesses (including rental management), 68 percent. For homeowners, bond payment is modeled as an annual lump-sum tax that is "paid out" by foregoing consumption and savings. For the business community, the bond payment is modeled as a tax on its capital stock in the county.

The renovation project's impact on employment and income is shown below in Table A-1. The employment and income impact estimates in the table show the annual net difference between two separate forecasts: Macomb County with an approved millage for renovation construction at the college and a control forecast without the millage. The annual job gains or losses are not additive, unless they are counted as job years. For instance, a new job that lasts for four years can be described as the generation of four "job years."

During the construction phase, 2013 through 2016, between 129 and 118 year-round jobs will be created at the various construction sites on campus.⁹ Due to both the consumption expenditures of these workers and the county's construction supply companies providing materials and services to the construction teams, between 38 to 46 indirect jobs would be created in the county. Therefore, the overall employment impact of the construction activity, alone, is between 174 and 156 year-round jobs in the county from 2013 to 2016. The annual employment multiplier of the on-campus construction activity is 1.3. For every 10 on-site construction jobs,

⁹ Because the Institute's economic impact model (REMI) is an annual model, it generates estimates on the number of year-round jobs. A year-round job can be full-time or part-time and can be composed of two or more short-term jobs which are common on construction sites. For example, four construction workers on the job site for three months each would be counted as one year-round job.

Table A-1 Economic Impact of Planned Renovation Construction at Macomb Community College

EMPLOYMENT	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Construction spending										
Direct employment	129	125	122	118	0	0	0	0	0	0
Indirect employment	46	45	42	38	-8	-11	-11	-10	-8	-7
Total employment	174	169	163	156	-8	-11	-11	-10	-8	-7
Impact of millage increase										
Millage impact on businesses	-36	-47	-54	-57	-58	-58	-56	-53	-51	-48
Millage impact on residential	-14	-14	-14	-13	-13	-12	-11	-11	-10	-10
Net employment impact	125	108	96	86	-79	-81	-78	-74	-69	-64
PERSONAL INCOME (Thousands of Dollars)										
Construction spending										
Wage and salary disbursement (\$)	6,770	7,180	7,430	7,560	330	-60	-300	-420	-460	-450
Personal income (\$)	6,320	6,920	7,340	7,650	1,050	640	370	210	150	140
Impact of millage increase										
Business										
Wage and salary disbursement (\$)	-1,246	-1,796	-2,171	-2,424	-2,589	-2,689	-2,687	-2,644	-2,569	-2,476
Personal income (\$)	-1,152	-1,747	-2,186	-2,510	-2,758	-2,960	-3,033	-3,067	-3,067	-3,040
Residential										
Wage and salary disbursement (\$)	-457	-514	-544	-563	-568	-566	-555	-540	-532	-523
Personal income (\$)	-2,655	-2,735	-2,789	-2,823	-2,842	-2,865	-2,857	-2,861	-2,850	-2,846
Net annual impact wage and salary (\$)	5,067	4,870	4,715	4,573	-2,827	-3,315	-3,542	-3,604	-3,561	-3,449
Real NPV (\$)	1,259									
Net annual impact personal income (\$)	2,513	2,438	2,365	2,317	-4,550	-5,185	-5,520	-5,718	-5,767	-5,746
Real NPV (\$)	-17,868									

another 3 jobs are created in the county. The construction phase will also generate more than \$6.3 million in annual income per year and more than \$6.7 million in wages and salaries.¹⁰

After the construction phase is completed in 2016, the county will suffer a minor loss of jobs due to the construction project's impact on area wages (the increased activity in the years 2013 to 2016 will tend to increase wages) and the loss of population as a small percentage of the project's construction and construction supply workers and their families leave the county.

Not surprisingly, the annual \$7.08 million increase in property taxes to retire the \$56 million construction bond in ten years will have a negative impact on the county economy due to the following:

- Reduction of household spending in the county; and
- Increase in capital costs for the county's business community.

Although the annual cost per household of the proposed construction project is modest, \$8.94, it will cut into consumer spending, resulting in a loss of county jobs in retail and consumer services. The employment impact is small; no more than 14 jobs will be lost. The impact on wages and salaries is also small; although the impact on personal income is much higher.

The estimated impact on the county's business community is larger, however. In short, the cost of doing business will increase slightly, causing the area's more marginal businesses to downsize and reduce their workforce. In addition, it will discourage companies from moving into the county. In 2013, it is estimated that 36 jobs will be lost in the county due to an increase in business property taxes. In 2014, this grows to a loss of 47 jobs and up to 58 jobs in 2017.

In order to estimate the impact of the construction project for the 10-year repayment period, we generate the net present value of both the wages and salaries and personal income that would be generated in the county for the 10-year period. These income streams are discounted by 2.5 percent annually.

The net present value (NPV), over the 10-year repayment period, of the construction project in terms of wages and salaries generated in the county is positive, \$1,259,000; however, since many of these wage and salary earners reside outside the county, the NPV of the county's personal income is negative -\$17,868,000. However, this should not be surprising. The renovation construction is not meant to be a job generator, but to increase the county's capacity to educate and train area residents.

¹⁰ The difference between the two is that personal income excludes wages and salaries earned by workers who live outside of Macomb County and includes the decline in government public assistance services.