Economic Impact Estimates of a Public Early Childhood Program

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REMI Webinar

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Disclaimer: What Do I Know about Economics, Economic Development or Early Childhood Development?

"A little learning is a dangerous thing; drink deep, or taste not the Pierian spring: there shallow draughts intoxicate the brain, and drinking largely sobers us again." ***Alexander Pope, 1709***

Pope is saying that a little learning or knowledge (the "shallow draughts") will only befuddle ("intoxicate the brain"), misleading us into thinking we know more than in fact we do. Remedy for this problem lies in continuing to learn ("drinking largely") at the "Pierian spring," the spring sacred to the Muses and considered the source of the knowledge of art and science.

The ancient Greek philosopher Aristotle summed it up when he noted "The more you know, the more you know you don't know." But he wasn't the first to do so. A couple of centuries earlier, the Chinese philosopher Confucius had observed, "Real knowledge is to know the extent of one's ignorance."

I confess to you that I my economic/economic development understanding and more particularly early childhood development have been "shallow draughts" but I continue to drink largely in both fields.

What Prompted This Study?

Moody's Analytics Describes Mississippi's Weaknesses as:

- Low per capita income.
- Low educational attainment.
- Weak and worsening migration.
- Prone to floods and tornadoes.
- Extremely low economic vitality.
- Uneven distribution of wealth and income.

US News and World Reports State Rankings for 2018 listed Mississippi as:

- 50th in healthcare
- 46th in education
- 48th in economy
- 49th in opportunity
- 49th in infrastructure
- 16th in crime
- 45th in financial stability
- 6th in quality of life

24/7 Wall Street Ranked Mississippi 48th overall in 2017

- 2016 Unemployment: 5.8% (7th highest)
- Pension funded ratio: 61.8% (9th lowest)
- Credit rating and outlook: Aa2/Negative
- Poverty: 20.8% (the highest)

I could go on with many other socioeconomic metrics compiled by well-meaning organizations, but you get the idea of what prompted this study.

Why does Mississippi's economy continue to perform so poorly over such a long period of time?

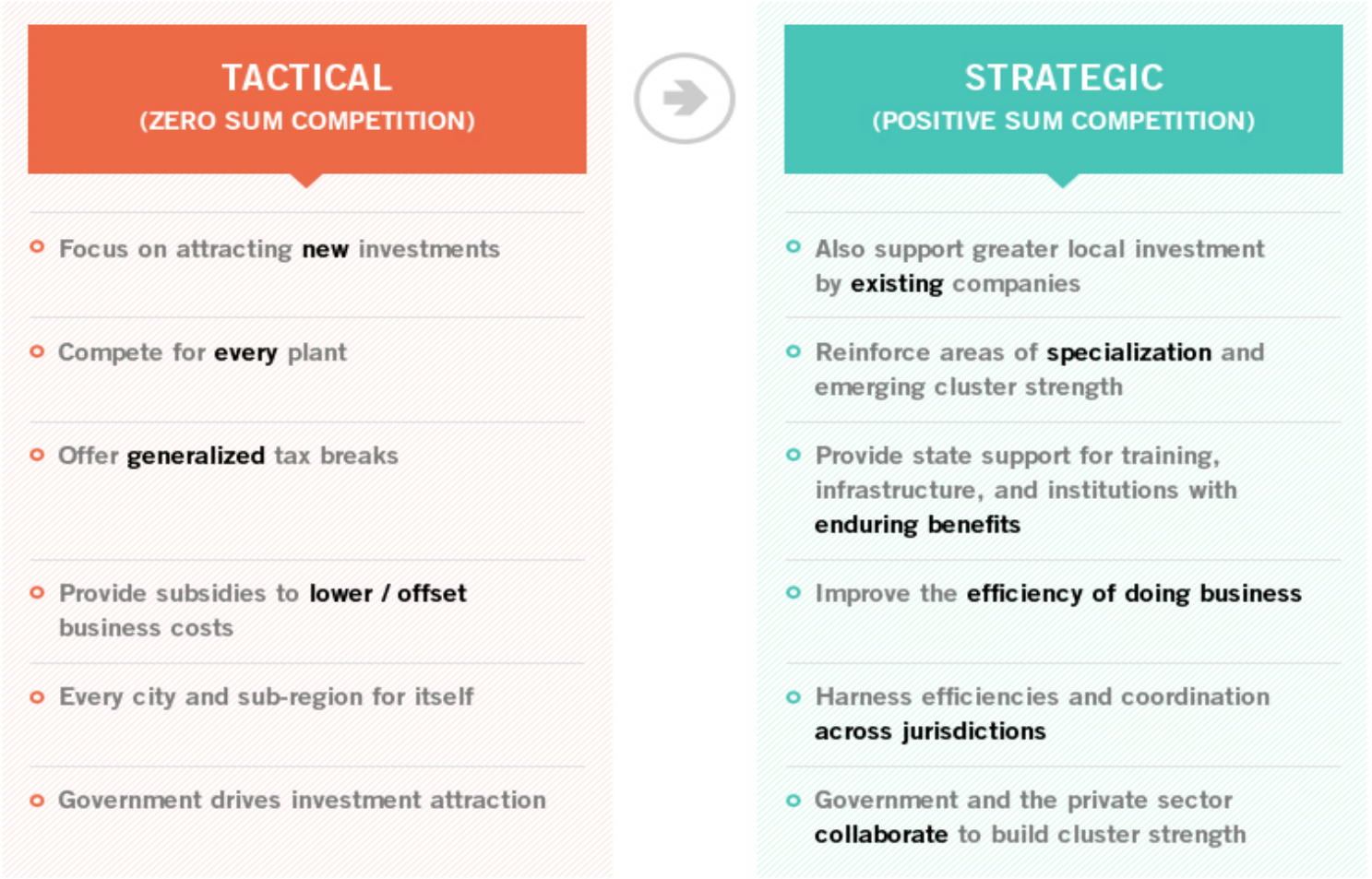
Economic Development vs Economic Growth

In simple terms, in an economy;

- Economic growth is the increase in a area's total output or gross domestic product (GDP) or per capita income.
- Economic development is usually indicated by an increase in citizens' quality of life - social, cultural, political, moral and economic factors.
- Economic development efforts are more comprehensive (qualitative) than economic growth efforts (quantitative).
- Economic growth doesn't necessarily equal economic development. While it is a well observed phenomenon that human development incomes are highly correlated with economic measures like GDP, that doesn't mean that improvements in GDP cause, or even correlate with, improvements in human development indicators.

- Let's think about improving <u>both</u> economic growth and citizens' qualities of life.

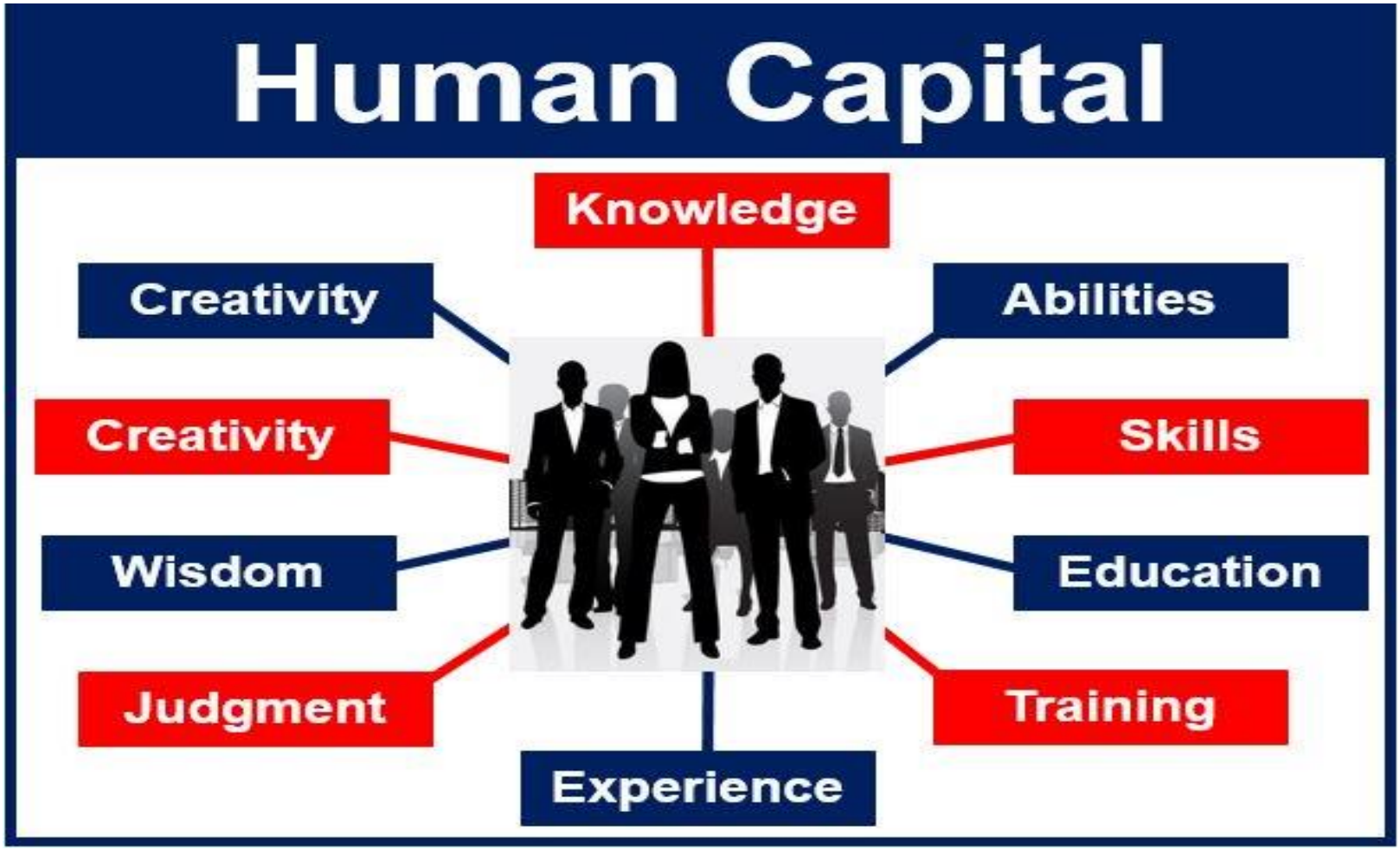
Economic Strategies



Source: Harvard Business School, Institute for Strategy and Competitiveness

Economic Growth and Human Capital

- There is a rich body of literature in human capital and economic growth.
- The idea that human capital plays an important role in explaining income differences has been present in economists' thinking for a long time.
- Such can even be traced to the work of Adam Smith and Alfred Marshall.
- Joseph Mincer first used the term "human capital" in 1958, although it was not until the 1960s that Gary Becker and Theodore Schultz developed a theory of human capital.
- Various models attempting to explain economic growth include the Solow and Swan models (neoclassical growth theory), and the endogenous growth models of Lucas, Romer, and Barro.
- All of this is to say that human capital has been and continues to be studied in the effort to understand the nuances of economic growth.



Human capital refers to the production factors, coming from human beings used to create goods and services. Knowledge, skills, habits, social and personality attributes and individual creativity form part of the human capital that contributes to the creation of goods and services.

Early Childhood Development Importance

"Recent studies of early childhood investments have shown remarkable success and indicate that the early years are important for early learning and can be enriched through external channels. Early childhood investments of high quality have lasting effects…. In the long run, significant improvements in the skill levels of American workers, especially workers not attending college, are unlikely without substantial improvements in the arrangements that foster early learning. We cannot afford to postpone investing in children until they become adults, nor can we wait until they reach school age — a time when it may be too late to intervene. Learning is a dynamic process and is most effective when it begins at a young age and continues through adulthood. The role of the family is crucial to the formation of learning skills, and government interventions at an early age that mend the harm done by dysfunctional families have proven to be highly effective."

— Nobel Prize-winning Economist James Heckman, University of Chicago

“The highest rate of return in early childhood development comes from investing as early as possible, from birth through age five, in disadvantaged families.

Starting at age three or four is too little too late, as it fails to recognize that skills beget skills in a complementary and dynamic way.

Efforts should focus on the first years for the greatest efficiency and effectiveness. The best investment is in quality early childhood development from birth to five for disadvantaged children and their families.”

James J. Heckman, December 7, 2012

High Quality Early Childhood Education is Essential for a Productive Workforce

1. Using federal, state, and private resources for early childhood education helps grow the economy by prepare young children to succeed in school and become better citizens; students from a high quality, early childhood development program earn more, pay more taxes, are more likely to be better educated and possess higher skills; are less likely to be incarcerated, less likely to be in poverty, and have better health.

2. Research from other ECD programs estimated that for each dollar invested in high quality early education and development, more than $6.00 accrue to the state in the form of future reductions in costs related to poor education, incarceration, poverty, health and lost productivity in the economy.

3. A formal early education and development industry is economically important. It can often exceed the number of employees and revenues than other industry sectors that receive more state government attention and resources.

4. An added bonus for a high quality early childhood development program is the help afforded to parents in becoming productive participants of the economy and the help given to them in fulfilling parts of their parental responsibilities.

Expected Short Term Benefits to Mississippi

- Provide jobs that directly employs more than 18,000 people statewide;
- Enable other business sector employers to attract and retain employees.
- Early education employees consume in local communities and pay local and state taxes;
- Early education learning centers purchase goods and services in local communities;

Expected Longer Term Benefits to Mississippi

- Lowers future costs for remedial and special education, and lessens grade repetition
- Improves high school graduation rates and produces workers with better skills;
- Prepares students with the ability to meet future labor force demands;
- Produces higher personal incomes through better jobs that result in more tax payments;
- A long-term outcome of an ECD program due to better learning and improved behavior is the reduction in the number of single mother births thus lowering state costs for births and child support;
- Lowers criminal justice and incarceration costs;
- Lowers the number of people who will live in poverty thus lowering future state welfare costs;
- Improves health outcomes in individuals thus lowering future state Medicaid cost;

Economic Impact Estimates Using the REMI model of Mississippi

- Mississippi used the 160 sectors, one region model of the state's economy for the ECD analysis.
- Version 2.0.3 was used to model the impacts.

These are conservative, thoughtful estimates, not predictions

- The baseball great and sometimes philosopher, Yogi Berra is quoted as saying “It's tough to make predictions, especially about the future.” Later he modified that quote somewhat by saying “… never make predictions, especially about the future”.

- Mississippi will continue to have an economy if nothing is done in the way of beginning a public, federal, state and privately funded high quality early childhood program, but the characteristics of the children and of a future economy will probably be less desirable and a large portion of the state’s citizens will continue to have a less desirable, lower standard of living.

Basis for the Inputs to the REMI model

- The economic impact analysis considers the direct impacts related to additional teachers and staff, the direct spending by an early childhood program in the way of supplies, materials, operating costs, etc., the rehabilitation of early childhood centers, the ability of parents of early childhood participants to become productive participants in the state's economy, state government spending and federal government spending.

- The economic impact analysis also considers the long-term, lagged effect impacts related to early childhood educated children being better educated with less lost time in educating them, more innovative and entrepreneurial, less likely to become inmates in the state's incarceration system, less likely to be in poverty, less likely for female participants to be single mothers, better health outcomes and an increase in the productivity of the participants when entering the state's workforce.

Specific Estimates for the Inputs (1)

Note: I have an Excel spreadsheet that I developed for each of the 28 inputs to the REMI model.

- The current 5 year average for the number of babies born each year is 38,837 with an estimated 61% of the children born to low-income mother. Thus there are 26,391children born annually to low-income mothers that are potential participants in the formal early childhood education program. This economic impact analysis considers children 0 to 36 months of age.

- The early childhood education research literature indicate that children from birth to 36 months of age benefit most from an early education program, thus there are 47,381 low-income children that could be served annually. If 1/3rd of these children are enrolled in the program, 7,896 children age 0 to 12 months of age and 15,792 children 13 to 36 months of age would be early childhood program participants, for a total of 23,688 children participating annually.

Specific Estimates for the Inputs (2)

- The costs of a quality early childhood education programs in out-of-home settings vary based on the market rate of child care expenses to support a quality program in the state or location within the state. For the basis of this analysis the amount of $6,350 is used for calculations. Thus, annual early childhood education program costs are estimated at $150.42 million. It is estimated that $35.0 million of this amount could be spent from a variety of federal and other state funds, leaving an additional amount for the state portion of the program at $115.42 million annually.

- For the use of the REMI model, the annual cost of the early childhood education program can be paid for by using resources from other state program costs, by increasing taxes or by some combination of both funding possibilities. In actuality, the remaining annual cost of approximately $115.42 million could be acquired through parent income, a tax credit to families choosing the high quality care program, grants to stimulate the development of high quality infant and toddler care and education, partnerships with Early Head Start, or a combination of various funding sources. For the use of the REMI model, the analysis will include reducing government spending (in other program areas without defining those program areas) and by increasing state taxes. No economic impact estimates of a combination of the two funding possibilities are provided.

Specific Estimates for the Inputs (3)

- The early childhood program will be operated 10 hours per day (normally 7:30 am to 5:30 pm), 5 days per week, twelve months of the year. Early childhood education literature suggests that up to 4 babies (0 to 12 months old) be assigned to a teacher, and up to 7 toddlers (13 to 36 months old) be assigned to a teacher. Thus, 1,974 baby teachers and 2,256 toddler teachers are needed for the program. Average compensation for teachers (pay plus benefits) with a minimum of a 2 year degree in child development technology or higher with a concentration in infant/toddler development is estimated at $27,000 annually. Total annual teacher compensation is estimated to be $114.21 million.

- Program administrative costs beginning in the second year of the program are estimated to be 7.5% of total program costs with 85% of the administrative cost consisting of compensation for administrators. Infant/toddler ECD programs can be combined for administrative purposes where one administrator supervises, with the help of a lead teacher at each location requiring up to 189 administrators, but no less than 150 administrators would be paid an average annual compensation (pay plus benefits) of $50,750. Each administrator would oversee about 22 teachers and 125 students. Total annual administrative compensation is $9.59 million. Administrative operating expenses are estimated to be $1.69 million annually. All administrators would hold a 4 year degree in child development, early childhood education or related field with early care and education administration experience.

Specific Estimates for the Inputs (4)

- The annual program costs for ongoing professional development of teachers and administrators, supplies, materials, utilities, etc. are estimated at $26.62 million. On-going annual professional development costs for administrators and teachers are estimated at $2.2 million and are included in the $26.62 million annual program costs.

- For a meaningful high quality early childhood education program, the 4,230 teachers and 189 administrators will be provided an intensive 5 months training program in the first year of the program. The teachers will be compensated for the 5 months and provided with tuition and training materials. First year teacher salaries are estimated to be $47.59 million and first year training costs are estimated to be $4.23 million. On-going professional development costs for the administrators and teachers are included in the on-going program costs list in #7 above.

Specific Estimates for the Inputs (5)

- Rehabilitation construction costs for early childhood facilities in the first year of the program are estimated at $41.65 million. This is based on 395 buildings housing an average of no more than 60 students each in 2,425 square feet of space. Rehabilitation costs are estimated at $43.50 per square foot.

- The buildings' rehabilitation costs of $41.65 million will be paid for through a bond issue estimated at 3.25% interest for 20 years.

- Mothers of children 0 to 36 months old enrolled in an early childhood education program will be more likely to participate in the workforce. It is estimated that half of the mothers (11,844) of children in the program will enter the workforce who previously were either not working, working part-time or could be enrolled in a workforce training program.

Specific Estimates for the Inputs (6)

- Children in an early childhood educational program age 0 to 36 months have been shown to have improved educational outcomes. It is estimated that half of the children in the program (3,948) will now graduate from high school, and of that number, 1,777 (45%) will go directly into the workforce, 987 (25%) will complete a two-year workforce training program, then enter the workforce and 592 (15%) will complete a four-year college degree then enter the workforce. At each level of educational attainment/workforce skills development entering the workforce, workers will be compensated at higher rates than if the person had not participated in the early childhood program and not completed high school.

- The early childhood education research literature indicates that participants in a high quality childhood education program are more innovative and entrepreneurial. It is estimated that one percent of the students annually (79) will start a new business venture creating an additional 3 jobs after they have been in the workforce for 10 years.

- It is estimated that $35 million of a variety of federal and other state childcare funds can be used to offset part of the state's annual costs in providing a high-quality early childhood education and development program.

Specific Estimates for the Inputs (7)

- In addition to better student graduation rates in high school, the educational process will become more efficient. It is estimated that half of children age 0 to 36 months in a high quality early childhood education program (3,948) will graduate "on time" and save one year of state annual school funds per student. The saving to the K-12 system of state funds is estimated to be $28.34 million annually.

- Children 0 to 36 months old in a high quality early childhood education program will be less likely to be involved in criminal activities requiring incarceration. Annually, it is estimated that 790 students would not be in the state's incarceration system that would have otherwise been if not a participant in the early childhood program. The saving to the state incarceration system budget is estimated to be $11.33 million annually.

- Children 0 to 36 months of age in a high quality early childhood education program will be less likely to be living in poverty. It is estimated that 75% or 5,922 children will not be living in poverty once through high school and participating in the workforce. The saving to the state for funding of poverty related programs is estimated to be $15.99 million annually

Specific Estimates for the Inputs (8)

- Female children 0 to 36 months of age in a high quality early childhood education program will be less likely to give birth as a single mother later in life. It is estimated that 60% of the females (2,369) in the early childhood education program will not be a single mother. The saving to the state for funding of single mother births and on-going support for the children born to single mothers is estimated to be $21.69 million annually.

- Children 0 to 36 months of age in a high quality early childhood education program will be more likely to have better health outcomes. It is estimated that annually, two-thirds of the children (5,290) in the early childhood education program will not be using state health resources for health care concerns. The savings to the state for funding of health care needs is estimated to be $19.34 million annually

- Increasing the worker productivity (output per man-hour of work) is an important part of growing an economy and increasing the standard of living for workers and their families. For the second generation of workers that are children of the beginning children in a state early childhood education program, it is estimate that the annual gain in productivity is two percent.

- No estimate is made of future program cost increases due to teacher and administrative compensation increases and other program cost increases.

REMI PV input table

Table 1: REMI inputs; PV is a policy variable used in the model.			
PV1: 1 Remove from State spending on going program costs		$115,420,076	
PV1: 1 Remove from State spending first year costs		$93,464,758	
PV1a: or increase state taxes for 1 yr and ongoings costs			
PV2: Subtract proposed teacher compensation difference from that based on model average compensation for teachers		2nd year and on teacher compensation adjustment	1st year compensation adjust
REMI Model compensation amount for 2016 is $28110	$28,110	-$4,695,340	-$1,956,392
PV3: Add infant teachers jobs		1974	
PV3: Add 1 to 4 Y.O. teachers jobs		2256	4230
PV4: Subtract Adm compensation difference in model (2016) $91680	$91,680	-$7,733,778	
PV5: Add administration jobs begin 2019 (sector: mgt of companies)		189	
PV6: Add supplies, matrial etc consumption (2019)		$ 26,619,827	
PV7: Add training costs for first year (2018)		$ 4,230,036	
PV8: Add construction costs as consumption(2018)		$41,646,818	
PV9: Bond annual payments (P & I)		($2,864,422)	
PV10: Reduce government spending for bond pmts		$2,864,422	
PV11: Add mothers increase in income	# emp	Ave annual wage % improvement from part-time or not working	Equivalent jobs
compensation employee equivalent	11844	70	8291
Begin impact in the year 2037 (from 2019) for entering WF, then 2 yrs, then 4 years. Model as an increase in consumption		Ave annual wage improvement compared to dropping out of HS	
PV12: Into WF in 2037	1777	$12,500	$22,207,688
PV13: into WF in 2039	987	$20,000	$19,740,167
PV14: into WF in 2041	592	$27,500	$16,285,638
Begin the impact of entreprenuers 10 years after completing HS (begin in 2047) in order for them to complete education and gain some work experiences	# firms	# employees	
PV15: Start new companies each 3 employees	79	237	
PV16: federal civilian gov't spending increase (begin in 2019)		$35,000,000	
PV17: Reduce government spending for k12 (begin 2033)		$28,337,405	
PV18: Increase annual wage improvement grad ontime	3948	$12,500	$49,350,419
PV19: Reduce government spending for incarceration (2034)	20	$2,266,961	
PV19a: Reduce spending in sector-waste mgt, remediation, etc	80	$9,067,843	
PV20: Reduce prison population (begin in 2034)		790	
PV21: Increase annual wage improvement for not in prison	711	$22,000	$15,634,213
PV22: Reduce government spending for poverty reduction		$15,989,536	
PV23: Increase annual wage improvement over poverty level	5922	$12,500	$74,025,628
PV24: Reduce government spending for single mother births(2030)		$21,658,122	
PV25: Increase annual wage improvement not single mom (2036)	2369	$12,500	$29,610,251
PV26: Reduce government spending for better health outcomes (2029)		$19,342,897	
PV27: Increase annual wage improvement over dropouts (2037)	5290	$12,500	$66,129,561
PV28: Increase % worker productivity (begin 2037)		2	

REMI Model Results (1)

- The annual cost of the early childhood education program can be paid for by reducing other state program costs, by increasing taxes or some combination of both funding possibilities.
- The analysis will include (1) reducing government spending (in other program areas) and (2) by increasing state taxes.
- No economic impact estimates of a combination of the two funding possibilities are provided.

REMI Model Results (1)

Table 3: ECD Program Estimated Economic Impact with Reduce Government spending							
	Increase in Gross Domestic Product	Increase in Total Employment (gov't and non-farm)	Increase in Private Non-Farm Employment	Increase in Personal Income	Increase in Compensation	Increase in Personal Consumption Expenditures	Increase in State Sales Taxes on Consumption (at effective rate of 6.22%)
Year	Millions of Fixed (2015) Dollars	Individuals (Jobs)	Individuals (Jobs)	Millions of Current Dollars	Millions of Current Dollars	Millions of Fixed (2015) Dollars	Millions of Fixed (2015) Dollars
2018	35.46	1,281.00	2,290.00	26.15	72.02	21.45	0.47
2019	248.24	5,420.00	6,391.00	376.78	453.84	280.93	7.18
2020	281.95	5,870.00	6,726.00	430.48	491.04	303.02	7.73
2021	295.03	6,010.00	6,796.00	469.32	516.86	318.18	8.11
2022	296.52	5,966.00	6,704.00	499.96	537.61	327.22	8.34
2023	291.55	5,844.00	6,552.00	523.16	553.09	333.79	8.51
2024	284.34	5,692.00	6,381.00	542.76	566.82	339.51	8.67
2025	275.53	5,529.00	6,208.00	559.74	578.83	342.86	8.76
2026	267.53	5,384.00	6,056.00	574.88	589.55	346.17	8.85
2027	261.64	5,269.00	5,932.00	591.85	602.46	349.74	8.95
2028	258.21	5,184.00	5,840.00	610.57	617.18	354.76	9.09
2029	236.09	4,818.00	5,674.00	610.43	627.68	349.37	8.96
2030	212.38	4,436.00	5,514.00	606.80	638.34	342.06	8.79
2031	212.59	4,407.00	5,479.00	626.14	656.72	346.87	8.92
2032	215.30	4,409.00	5,470.00	649.72	678.70	353.12	9.08
2033	207.70	4,226.00	5,555.00	657.72	706.02	400.05	10.28
2034	197.85	4,080.00	5,461.00	665.03	746.96	398.20	10.25
2035	203.69	4,121.00	5,479.00	692.58	774.11	404.82	10.43
2036	218.51	4,265.00	5,598.00	767.36	843.70	432.12	11.15
2037	260.68	4,501.00	5,946.00	998.84	1,070.62	554.04	14.31
2038	273.25	4,605.00	6,019.00	1,044.46	1,114.14	561.97	14.55
2039	287.95	4,731.00	6,114.00	1,094.37	1,161.46	591.46	15.36
2040	295.76	4,786.00	6,115.00	1,141.47	1,203.59	598.72	15.60
2041	304.69	4,844.00	6,147.00	1,190.54	1,249.57	622.21	16.26
2042	307.25	4,832.00	6,114.00	1,234.79	1,290.55	627.27	16.45
2043	309.50	4,816.00	6,079.00	1,280.30	1,332.56	632.28	16.64
2044	311.99	4,803.00	6,047.00	1,327.73	1,376.17	637.57	16.85
2045	314.92	4,795.00	6,021.00	1,377.43	1,421.73	643.12	17.06
2046	318.39	4,791.00	6,000.00	1,429.95	1,469.46	648.99	17.29
2047	341.36	4,957.00	6,142.00	1,500.94	1,532.60	661.07	17.68
2048	346.95	4,972.00	6,134.00	1,561.86	1,585.20	668.74	17.95
2049	352.46	4,985.00	6,127.00	1,625.46	1,639.50	676.70	18.24
2050	358.04	4,997.00	6,121.00	1,692.03	1,695.75	685.00	18.53
2051	363.83	5,011.00	6,116.00	1,762.50	1,754.21	693.80	18.84
2052	369.85	5,027.00	6,113.00	1,836.97	1,815.01	703.07	19.17
2053	376.09	5,043.00	6,111.00	1,915.64	1,878.30	712.82	19.51
2054	382.58	5,062.00	6,110.00	1,998.86	1,944.25	723.11	19.86
2055	389.29	5,081.00	6,111.00	2,086.87	2,012.99	733.98	20.24
2056	396.18	5,101.00	6,113.00	2,180.07	2,084.54	745.26	20.63
2057	1,189.48	11,644.00	12,408.00	9,428.42	10,410.77	2,678.83	75.18
2058	1,259.11	12,140.00	12,764.00	9,673.34	10,590.84	2,648.11	74.66
2059	1,248.12	11,952.00	12,500.00	9,811.71	10,668.55	2,611.62	73.92
2060	1,189.69	11,376.00	11,896.00	9,868.50	10,676.89	2,557.46	72.68

REMI Model Results (2)

Table 4: ECD Program Estimated Economic Impact with Increased taxes							
	Increase in Gross Domestic Product	Increase in Total Employment (gov't and non-farm)	Increase in Private Non-Farm Employment	Increase in Personal Income	Increase in Compensation	Increase in Personal Consumption Expenditures	Increase in State Sales Taxes on Consumption (at effective rate of 6.22%)
Year	Millions of Fixed (2015) Dollars	Individuals (Jobs)	Individuals (Jobs)	Millions of Current Dollars	Millions of Current Dollars	Millions of Fixed (2015) Dollars	Millions of Fixed (2015) Dollars
2018	96.03	2,374	2,313	77.31	75.52	13.85	-0.33
2019	312.87	6,633	6,303	438.46	455.21	268.60	6.12
2020	335.94	6,948	6,520	490.02	488.79	287.83	6.61
2021	340.21	6,979	6,497	526.70	511.18	300.49	6.93
2022	334.05	6,839	6,331	554.55	528.62	306.70	7.09
2023	322.94	6,643	6,125	575.54	541.23	311.26	7.22
2024	310.82	6,434	5,915	593.24	552.49	315.27	7.33
2025	298.20	6,226	5,712	608.35	562.29	316.77	7.38
2026	287.30	6,047	5,541	622.12	571.21	318.65	7.44
2027	279.04	5,903	5,405	637.80	582.55	320.86	7.50
2028	273.79	5,796	5,305	655.41	595.97	324.64	7.60
2029	249.04	5,395	5,131	653.04	604.99	317.44	7.44
2030	222.77	4,977	4,964	646.94	614.16	308.27	7.22
2031	222.04	4,938	4,932	665.20	631.52	311.97	7.32
2032	224.02	4,930	4,927	687.69	652.61	317.10	7.46
2033	214.28	4,715	5,011	693.01	678.74	362.76	8.62
2034	213.71	4,690	5,008	733.35	724.11	375.25	8.95
2035	218.39	4,715	5,030	759.96	750.83	379.88	9.09
2036	232.01	4,843	5,150	833.89	819.73	405.99	9.78
2037	271.95	5,049	5,492	1,062.98	1,045.35	526.28	12.89
2038	283.12	5,136	5,561	1,106.89	1,087.63	532.80	13.11
2039	296.67	5,247	5,656	1,155.15	1,133.77	561.17	13.88
2040	303.52	5,289	5,657	1,200.62	1,174.73	567.19	14.09
2041	311.54	5,335	5,691	1,247.90	1,219.61	589.60	14.73
2042	313.23	5,312	5,660	1,290.32	1,259.48	593.47	14.88
2043	314.76	5,287	5,628	1,333.96	1,300.45	597.34	15.05
2044	316.63	5,266	5,601	1,379.43	1,343.05	601.51	15.22
2045	319.01	5,250	5,579	1,427.08	1,387.63	605.94	15.40
2046	321.99	5,240	5,563	1,477.39	1,434.37	610.69	15.60
2047	344.48	5,399	5,710	1,546.11	1,496.55	621.70	15.96
2048	349.63	5,408	5,708	1,604.56	1,548.19	628.27	16.20
2049	354.70	5,415	5,706	1,665.38	1,601.48	635.09	16.45
2050	359.82	5,421	5,704	1,728.83	1,656.66	642.19	16.71
2051	365.16	5,429	5,705	1,795.93	1,714.00	649.78	16.98
2052	370.71	5,438	5,706	1,866.69	1,773.62	657.80	17.27
2053	376.47	5,449	5,709	1,941.27	1,835.66	666.25	17.57
2054	382.43	5,461	5,713	2,019.99	1,900.27	675.16	17.89
2055	388.55	5,473	5,717	2,102.96	1,967.54	684.42	18.21
2056	394.83	5,486	5,723	2,190.61	2,037.51	694.04	18.55
2057	1,187.09	12,019	12,019	9,432.18	10,361.64	2,625.15	73.02
2058	1,256.05	12,508	12,378	9,670.19	10,539.89	2,592.64	72.45
2059	1,244.40	12,312	12,117	9,801.03	10,615.72	2,554.31	71.65
2060	1,185.34	11,730	11,517	9,849.51	10,622.14	2,498.31	70.35

Analysis of Results (1)

- There are estimated annually, 118,453 Mississippi children 0 to 5 years old who are born to low income mothers that could substantially benefit educationally, socially, and health-wise from a high quality early childhood education and development (ECD) program.

- A state-fund ECD for one-third of the infants (0 to 12 months old) and toddlers (13 to 36 months olds) for a total of 23,688 children annually will cost an estimated $150.42 million each year of which $35 million could be paid with from a variety of federal and other state funds.

- The net state funded portion of the ECD program is estimated to cost $115.42 million for the first full ten years of the program. After 10 years, the collective effects of the program on the children participants will begin to save other state agencies state program funds through improved child educational outcomes, incarceration reduction, poverty reduction, single mother birth reduction and health outcomes. By the 19th year of the program (the first year of the full effects on the initial group of children entering the program in 2019) the net state funded portion of the ECD program is estimated to cost $18.76 million, an 84% reduction from the beginning state cost.

Analysis of Results (2)

- Results from the REMI model for each of the methods of paying for the ECD program are relatively close in values. No attempt is made to place a value judgment on which method is a better way to pay for the ECD program.

- One important observation gleaned from the REMI model output from the output estimates of each method of paying is that there is a significant time-lag for the effects of the ECD program on the participants before they begin to make greater contributions to the Mississippi economy.

- Beginning the program in 2018 with teacher training and facilities rehabilitation efforts allows the first full program participants to graduate from high school in 2035. The first cohort of ECD participants will enter the workforce after graduating from high school, opt to become more qualified through workforce training and/or continue education in the community college and university system.

Analysis of Results (3)

- Some modest increases in state gross domestic product, personal income and compensation occur from 2035 to 2056, but significant increases occur in the economy after the year.2056 when the first group of students in the high quality ECD program begins to enter the workforce and/or become more skilled workers. The ECD program participants then begin to contribute significantly to the economy.

- Choosing a discount rate to evaluate the cost to benefit of the ECD proposed program is based on the Social Rate of Time Preference (SRTP). SRTP is a measure of society's willingness to postpone private consumption now in order to consume later. An indicator of SRTP is the earning rate on personal savings (i.e., by individuals). Since personal savings rates are at a historic low currently, a discount rate of 2% is chosen for the estimation of the cost to benefit analysis.

Analysis of Results (4)

- The estimated total benefit increase in Mississippi gross domestic products discounted at 2% over the 42 years of the analysis is $9,753.45 million from 2018 to 2060. The estimated total ECD program costs discounted at 2% over the same time period is $1,737.20 million. Thus the benefit/cost ratio is 5.6 for the effects of the ECD program on state gross domestic product.
  Note: This compares favorably with Dr. Heckman's estimated cost to benefit of 8.

- For perspective on the estimated cost to benefit ratio (CBR) for a high quality ECD program in Mississippi, a typical highway transportation project might have a CBR of 1.5, a specialized public project similar to a mass transit system might have a CBR of 1.25 and a large state incentivized economic development project might have a CBR of 6.0.

Thanks for attending the webinar.

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