

ECONOMIC IMPACTS OF INDUSTRIAL PARKS: EVIDENCE FROM VIRGINIA'S TOBACCO REGION MEGASITE PROGRAM

REMI Webinar

December 17, 2020



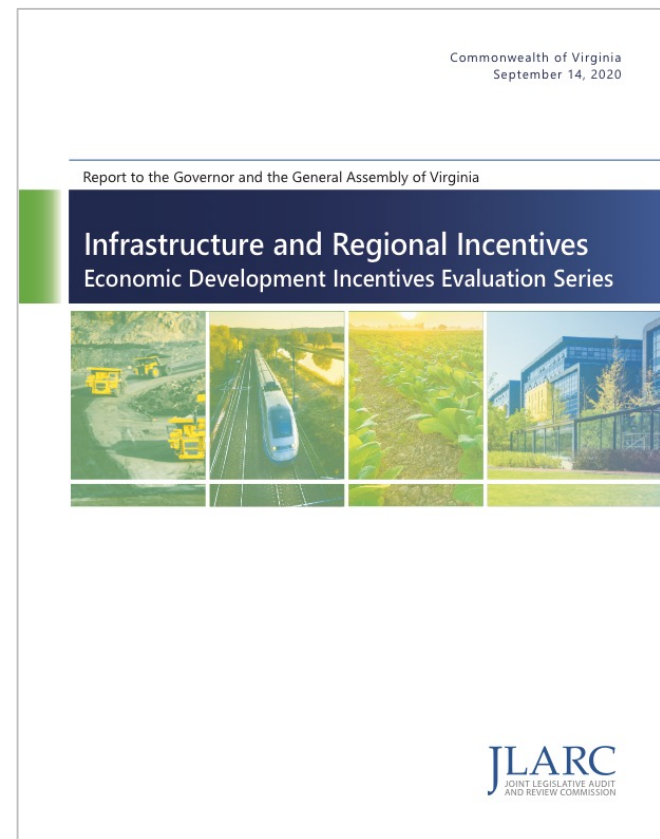
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OUTLINE OF PRESENTATION

- Study Background
- Literature: Rationale and economic development effects
- Tobacco Region Megasite Program
- Data and Method
- Economic and Tax Revenue Impact Results
- Summary and Remaining Questions
- **Acknowledgements:** This research was completed with the assistance of contract funding from the Commonwealth of Virginia's Joint Legislative Audit and Review Commission (JLARC) to evaluate state economic development incentives. The views do not reflect those of JLARC or its staff.



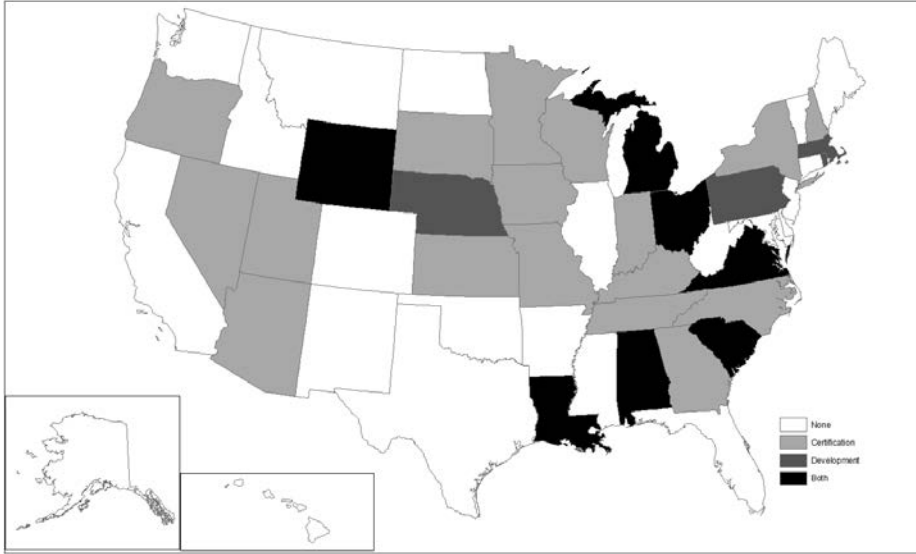


BACKGROUND AND LITERATURE



STATE INDUSTRIAL PARK INVOLVEMENT HAS INCREASED

- Industrial park development is primary/only economic development policy in many rural localities.
- Site certification--North Carolina offered one of the first site readiness programs in 2001 and by 2008, 15 states had such a program (Site Selection 2013). Approximately half of states now operate a program.
- In addition, at least 11 states (including Virginia) have site development programs that provide funding for industrial site development to bring them to higher levels of site readiness



RATIONALE FOR PUBLIC INVESTMENT

- Imperfect information (reduced search costs)
- Regulatory lags and land assembly cost uncertainty (land ownership and land use fragmentation)
- Quasi public goods (roads, bridges, other infrastructure)
- Reduce environmental externalities by land-use segregation (e.g., congestion, pollution)
- Agglomeration economies (industrial clusters)

LITERATURE REVIEW

- Bartik (2020). ***Public infrastructure and land development*** provide better return on investment than tax incentives.
- Chappel (2014). Establishments located in industrial zones in the San Francisco Bay area were more likely to expand than those located elsewhere. Zones assist growth by providing more "flex" space that aids industrial expansion.
- Kriesel and McNamara (1991). Industrial site quality (as reflected in the estimated price of local industrial parks) is associated with a higher likelihood of attracting a manufacturing plant.
- Luger and Goldstein (1991). Research park success varies. Research park counties grew faster than their matches when the parks were older, university-owned, and provided garbage collection services (a proxy for park provided services).
- Peddle (1984). Communities with industrial parks had more manufacturing firms than those without.

INDUSTRIAL PARK SELECTION

- Peddle (1988) finds that industrial parks are more likely to be built in particular types of places, including newer communities with greater highway, rail, and airport accessibility, higher population and population growth, lower population density, and the availability of public fire protection.
- Peddle (1990). Particular types of firms may be attracted to established industrial parks, such as relatively small businesses (20 to 100 employees), more capital intensive and less energy intensive firms, and light industry.
- Results indicate that population growth, flatter terrain, lower population density, highway access, rail access are positively and statistically significantly associated with the inventory of Virginia industrial site acreage.



TOBACCO REGION MEGASITE PROGRAM

VIRGINIA INDUSTRIAL PARK INVESTMENT PROGRAMS

- Several funding programs: Tobacco Region Megasite Program, Virginia Business Readiness Program, GO Virginia, Economic Development Access Program (speculative access roads)
- State government industrial park spending forms approximately 4% of all economic development incentive spending (including grants and tax expenditures exemptions=\$2.3 billion) over FY10-FY18 period
- Virginia spending is probably representative of southern region (e.g., megasite locations)



Source: *Site Selection Magazine* (2016)

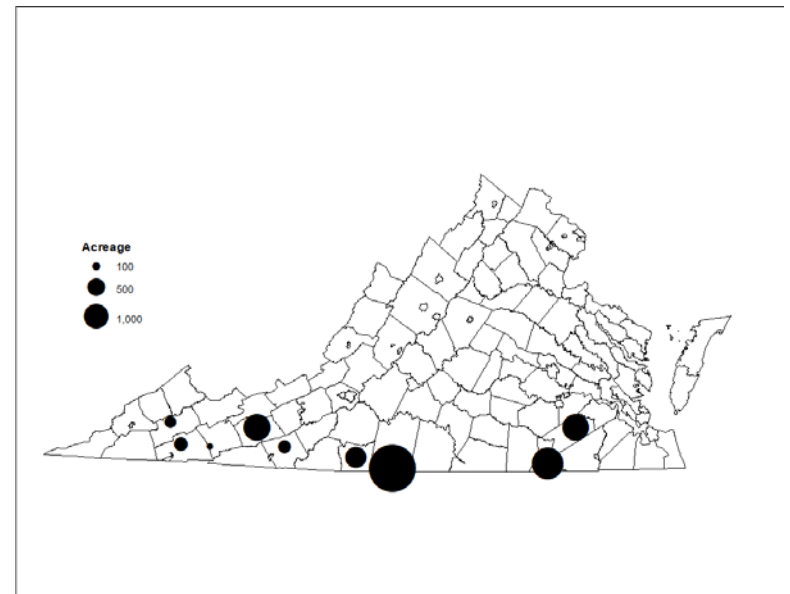
TOBACCO REGION REVITALIZATION COMMISSION

- Established in 1999 with part of state Tobacco Master Settlement Agreement (MSA) Funds
- Assist transition of tobacco growers to other products and promote regional development
- Various programs: Education, R&D, industrial incentives, agribusiness, *megasites*



NINE FUNDED INDUSTRIAL PARKS IN TOBACCO REGION THROUGH MEGASITES PROGRAM

- Nine funded parks
- Only four are actual megasites (1,000 acres or more)
- Parks began opening to business 2013 to present
- Program motivated by automotive megasite study conducted in 2005
 - It concluded that none of the candidate sites were ideal for automotive megasite



TOBACCO REGION MEGASITES VS. NATIONAL MEGASITES

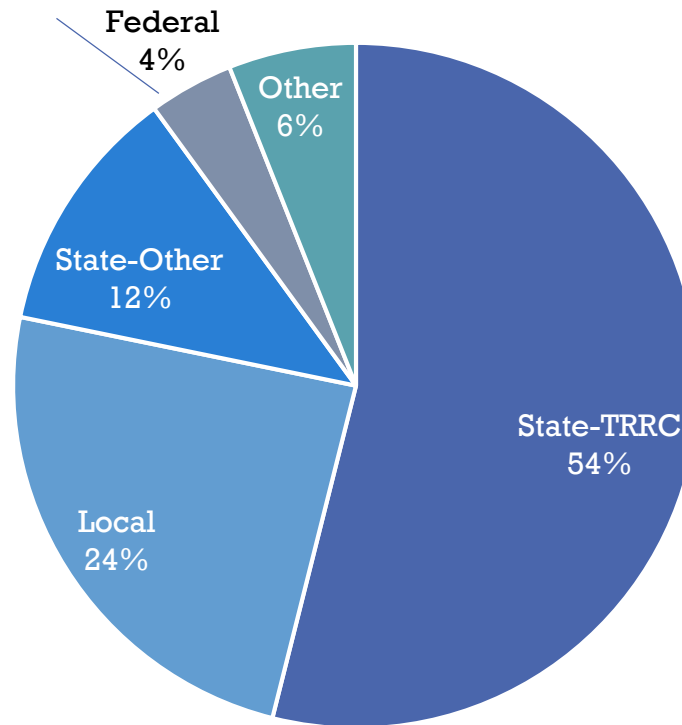
Characteristic	All U.S. Counties	All U.S. Megasite	Tobacco Region Megasites
Topography Scale	8.9	5.6	8.5
Urban-Rural Scale	5.0	3.2	4.3
Working age pop<30 miles	--	125,681	35,065
Working age pop<60 miles	--	573,042	402,058
Average Acreage	--	2,163	1,865
% Interstate	45	70	75
% Rail	81	93	100
% Commercial Air	81	22	0
% College Educated	21	22	13
Number	4,126	190	4

TOBACCO COMMISSION FUNDED OVER HALF OF \$180 MILLION PARK COSTS

Economic Development Administration

New Market Tax Credits

U.S. Dept of Interior, OSMRE Abandoned Mine Land (AML)



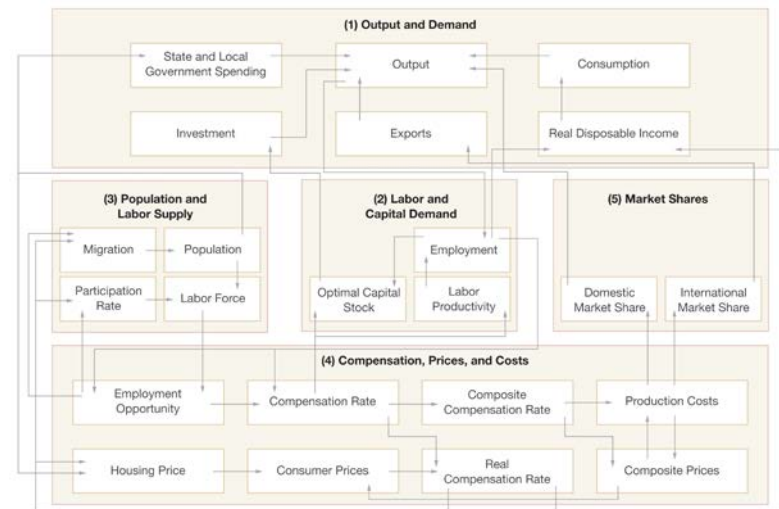


DATA AND METHOD



REMI PI+ ANALYSIS

- Development Phase
 - Planning
 - A&E
 - Construction
- Occupancy Phase
 - Net direct employment estimate over time
- REMI PI+ is a dynamic, multi-sector regional economic simulation model



STEPS IN ESTIMATING OPENING ECONOMIC AND REVENUE IMPACTS

- Estimation of park absorption (based on survey results regarding age and location of park). Varies by level of urbanization and year of opening
- Estimate park employment per acre (based on survey)
- Estimate percentage of park absorption that is state job creation rather than relocation from locality and elsewhere in state (assumed to be 50% loosely based on survey evidence presented in another slide)
- Estimation of “but for” availability of park (Bartik methodology)
- Assignment of park employment to industries (assumed to be manufacturing and warehousing in proportion to state percentages). Assign to firm employment with displacement.

LOCAL DEVELOPER SURVEY

- 67 respondents (out of 133 localities) for 50.1% response rate
- Designed to obtain information on variety of economic incentive topics (e.g., EZ, firm location factor importance, “but for” etc.)
- Block of questions on industrial parks to evaluate Virginia programs
 - Questions on park inventory (acreage) and planned park improvements
 - Question on park occupancy levels and characteristics (e.g., employment)



JLARC Evaluation of Economic Development Incentives – Survey of Local Economic Developers

Title of the Study:

Survey of Local Economic Developers (Institutional Review Board Number UVA IRB-SBS#3126)

Joint Legislative Audit and Review Commission (JLARC) (<http://jlarc.virginia.gov/>) is a non-partisan research and oversight agency that conducts independent research on behalf of the Virginia General Assembly. During the 2016 General Assembly session, the legislature directed JLARC to evaluate state economic development incentives on an ongoing basis. JLARC contracted with the University of Virginia's Weldon Cooper Center for Public Service to perform the evaluations.

Purpose of the Survey

This survey is being sent to local economic developers to obtain input on the value of economic development incentives in influencing business decisions. Your responses will contribute to the quality and usefulness of the evaluations and ultimately the findings and recommendations included in JLARC reports.

Economic Development Incentives

For purposes of this survey, economic development incentives include grants; income tax credits; sales and use tax exemptions; property tax abatements; other preferential tax treatment; loans; early and seed-stage investments; and other forms of financial or in-kind assistance.

LOCAL DEVELOPER SURVEY LIMITATIONS

- Unfortunately, in haste to get done no questions on park occupant industries (local versus export-base) or park pricing strategies
 - NAICS (2-3 digit) composition not asked
 - Some commercial and industrial parks (primarily in economically more prosperous areas) are commercial, market-rate developments. Parks in rural and distressed areas are publicly owned and provide no cost developed land as an economic incentive based on interviews.

JLARC ECONOMIC DEVELOPMENT SURVEY

E. ASSESSMENT OF SUPPLY AND DEMAND FOR BUSINESS READY SITES

E1. How big of a constraint on local economic development is the lack of "shovel-ready" (i.e., all zoning, infrastructure, and permits are in place and available for business development for occupancy) commercial and industrial sites in your locality/region?

1. A large constraint
2. A moderate constraint
3. A small constraint
4. Not a constraint at all
5. Not available/Don't know

E2. Does your locality offer any business/industrial parks with at least 100 contiguous acres that are business ready?

1. Yes
2. No

E.2.a.. If you answered "Yes", please provide the following: name of park, year of establishment, amount of total developed acreage, amount of developed acreage occupied, ownership (public, public/private, private), number of firms/organizations, total employment at firms, . If none, please state "none."

Name of Park	Year Established	Total Developable Acreage	Developable Acreage Occupied	Ownership (public, private, public/private)	Number of Occupant Firms	Estimated Employment at Occupant Firms in 2019

12

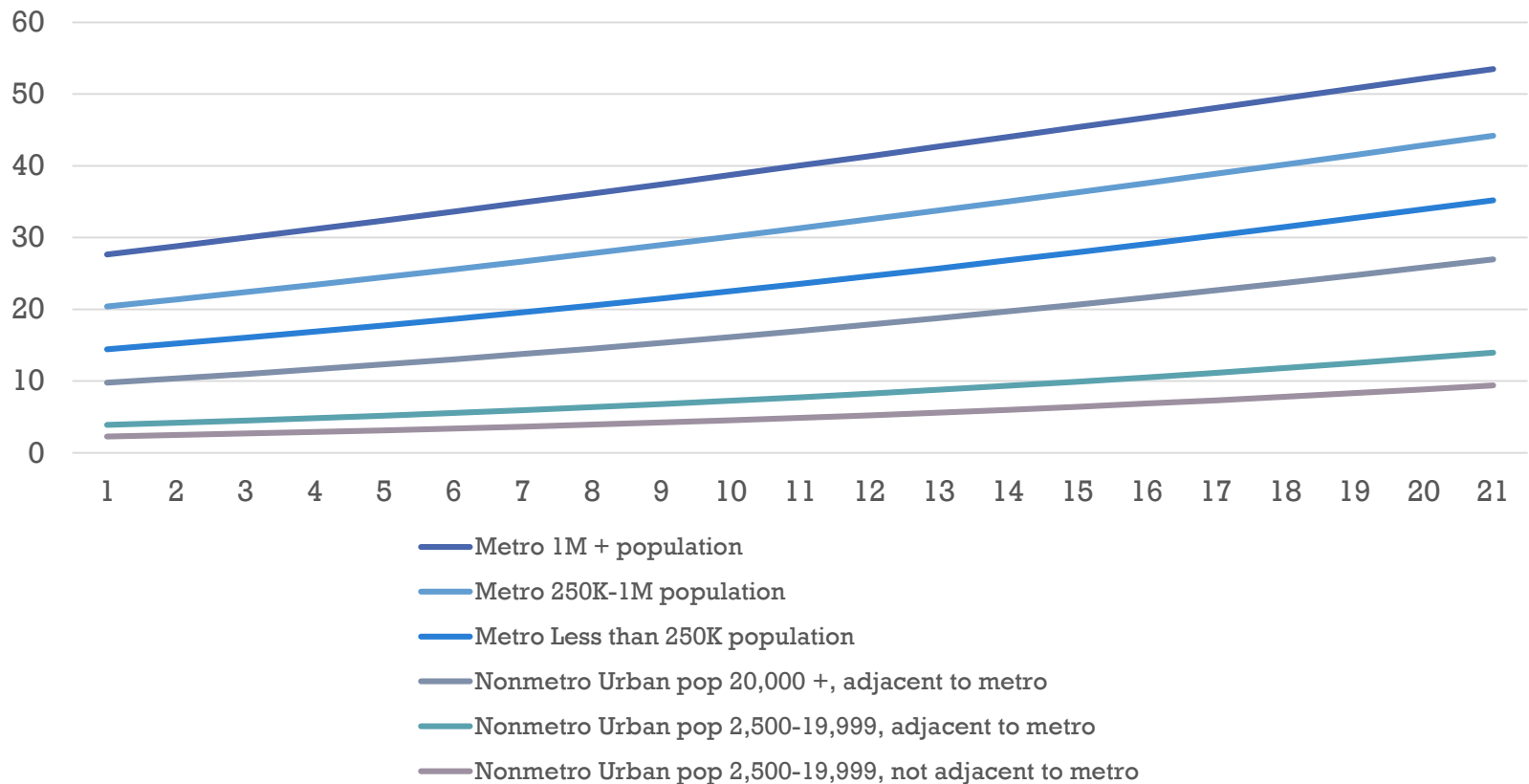
INDUSTRIAL PARK ABSORPTION DETERMINANTS

- Used two variables
 - AGE. Years since site(s) available for occupancy (i.e., opening date)
 - URCODE. USDA ERS Rural-urban continuum variable (1=Large metro area county, 9=More remote rural nonmetro county)
 - Also explored private/public ownership variable (private ownership was associated with significantly higher absorption but did not have great confidence in interpretation)
- Fractional probit was used because the dependent variable is measured as a proportion bounded by 0 and 1
- Of the survey 67 respondents, 36% (24 respondents) indicated that they had business/industrial parks of at least 100 contiguous acres. The average park size was 552 acres (compared to an average of 895 acres for the 9 Tobacco Region megasites) of which 205 acres were occupied by businesses for an average absorption rate of 37%.

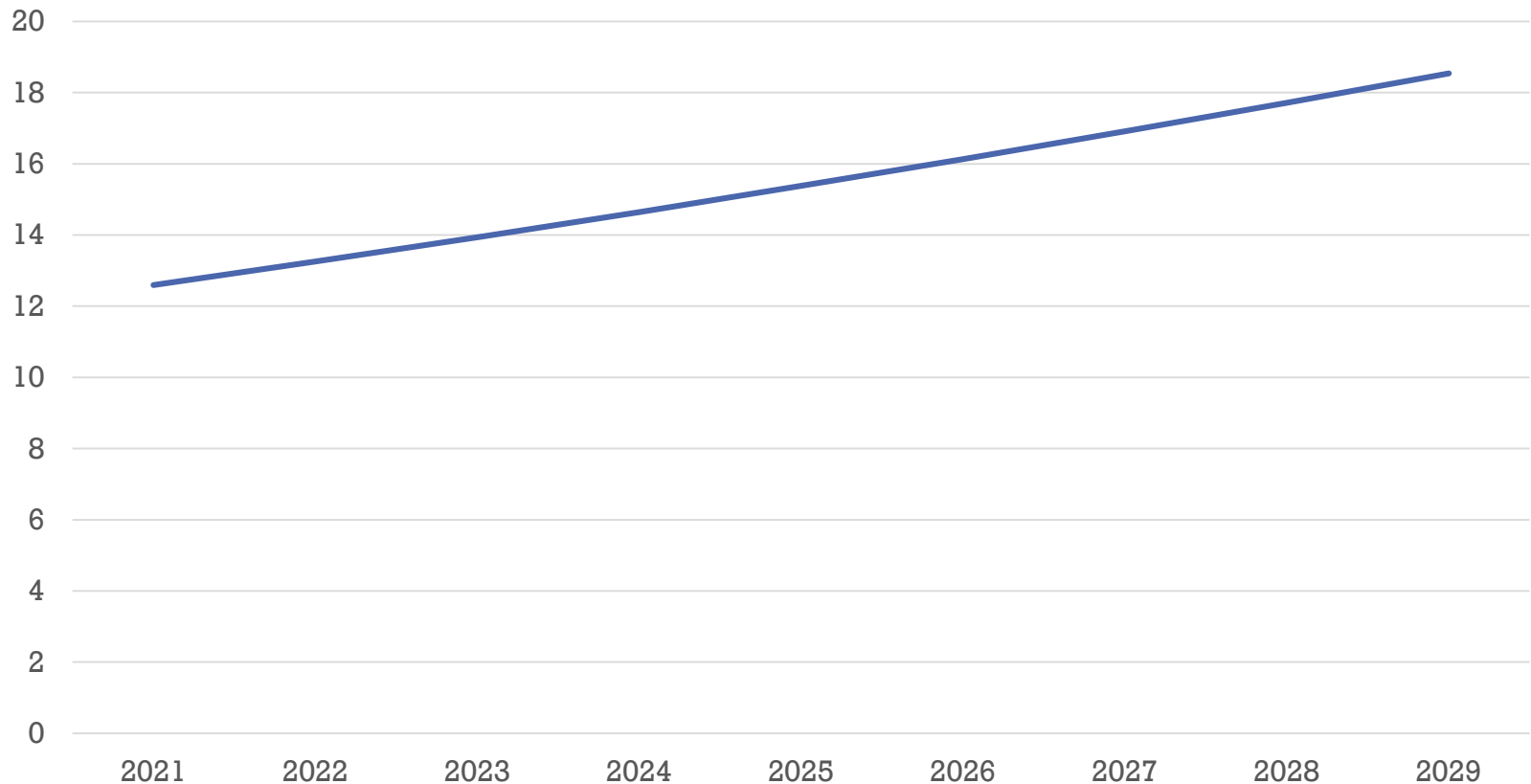
FRACTIONAL PROBIT REGRESSION RESULTS

Variable	Coef	dy/dx	Std. Dev.	z	P value
<i>AGE</i>	0.003406	0.15795	0.02031	1.69	0.094
<i>URCODE</i>	-0.23409	-0.18669	0.09092	-2.42	0.010
<i>CONSTANT</i>	-0.0218588		0.62416	-0.58	0.565
<i>Num Obs</i>	23				
<i>Wald chi2(2)</i>	1.27409				
<i>Prob>chi2</i>	0.00000				
<i>Log pseudolikelihood</i>	-12.0349				
<i>Pseudo R2</i>	0.1363				

ABSORPTION RATE BY URBAN RURAL CODE



TOBACCO REGION MEGASITE ESTIMATED PARK ABSORPTION RATE



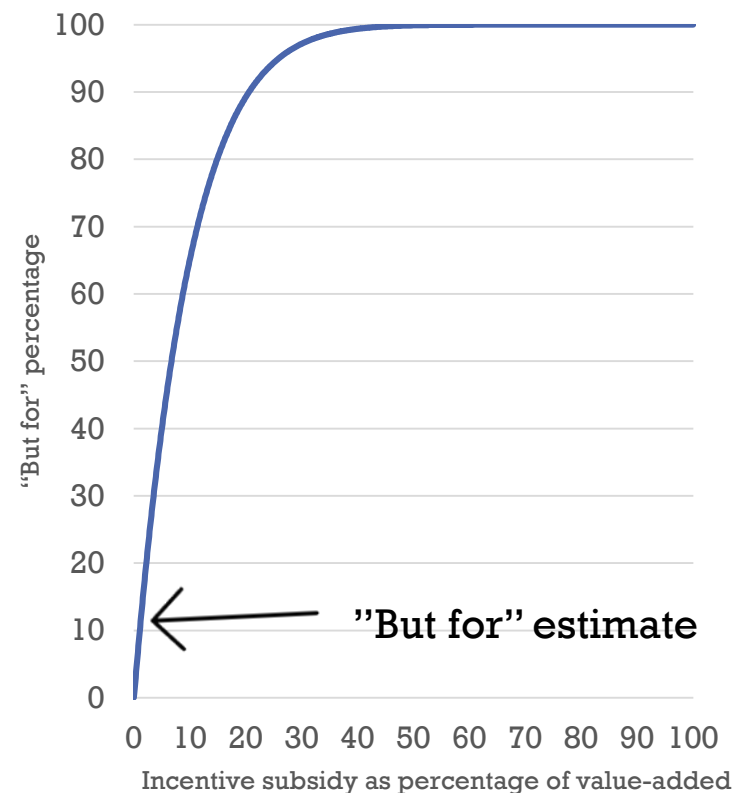
MOST NEW BUSINESS/INDUSTRIAL PARK OCCUPANTS ARE RELOCATION/EXPANSION OF FIRMS WITHIN LOCALITY OR STATE

“WHAT PERCENTAGE OF FIRMS WOULD YOU ESTIMATE FALL INTO THE FOLLOWING BUSINESS ORIGIN CATEGORIES?”

Category	%
Business startups	7.6
Relocation or expansion of existing business within locality	39.8
Relocation or expansion of existing business within state	23.2
Relocation or new location of business operating outside VA	29.4
Total	100.0

“BUT FOR”

- Estimated based on Bartik (2018) tax elasticity formula
- Assumed that park land is provided as in-kind incentive to relocating/expanding business (park managers indicated they would do this)
- Assumed that industrial occupant has value-added characteristics per employee same as state distribution for manufacturing and warehousing (REMI data used)





RESULTS

DEVELOPMENT PHASE RESULTS

Year	Employment	Virginia GDP (Millions)	Megasite development spending (Millions)	Program costs (Millions)	State Tax Revenue (millions)
2008	139	\$14.58	\$13.49	\$0	\$0.50
2009	40	\$5.75	\$3.47	\$0	\$0.18
2010	111	\$12.92	\$10.99	\$0	\$0.41
2011	414	\$48.87	\$43.63	\$24.96	\$1.54
2012	349	\$46.41	\$36.74	\$27.17	\$1.45
2013	220	\$31.81	\$22.83	\$20.96	\$1.08
2014	200	\$28.98	\$22.24	\$12.79	\$0.98
2015	71	\$12.73	\$8.21	\$6.30	\$0.48
2016	-4	\$1.21	\$0.17	\$0	\$0.12
2017	42	\$6.26	\$7.21	\$0	\$0.30
2018	70	\$10.78	\$11.43	\$4.90	\$0.44
Total					\$7.49

OCCUPANCY PHASE RESULTS

(TOTAL REVENUE GENERATED \$28.5 MILLION COMPARED TO MEGASITE PROGRAM INVESTMENT OF \$97 MILLION OR 29%)

Year	Employment	Attributable to Program	Private Employment	GDP (millions)	State Tax Revenue (millions)
2008-18					\$7.49
2020	1,301	139	248	\$33.73	\$1.18
2021	1,377	148	266	\$40.84	\$1.40
2022	1,450	155	284	\$45.68	\$1.61
2023	1,524	163	299	\$50.44	\$1.81
2024	1,602	172	311	\$55.13	\$2.00
2025	1,682	180	322	\$59.73	\$2.19
2026	1,765	189	333	\$64.52	\$2.39
2027	1,850	198	346	\$69.65	\$2.59
2028	1,938	208	359	\$75.12	\$2.81
2029	2,028	217	374	\$81.22	\$3.05
Total					\$28.51

RETURN IN REVENUE PER DOLLAR SPENT

- Tobacco Region Megasite Program=30¢
- Average Virginia economic development incentive=44¢
(JLARC. 2020. *Economic Development Incentives 2020: Spending and Performance*)
- Why?
 - Slow absorption rate for mainly rural region
 - Local and state relocations and expansions are likely significant portion of total occupants
 - Not all occupants will be completely export base (I assume that they are in megasite targeted manufacturing and warehousing industries but there is some displacement even then)
 - Relatively high development costs because of terrain
 - Complete buildout rather than phased buildout in response to demand

LESSONS FOR PRACTICE

Argument	Counterargument
Conduct due diligence (market feasibility and industry targeting studies)	None (except studies appear to never counsel that project not be pursued)
Increase federal and outside contribution to effort (i.e., leverage)	Longer development timeline
Create park of suitable scale or phase development rather than all at once approach	Economies of scale in construction are limited
Collaborate with other localities on larger industrial park development (cost and revenue sharing)	None
Target appropriate firms (export base and industrial location and expansion rather than local firm relocation)	Longer park absorption



SUMMARY AND REMAINING QUESTIONS

SEVERAL TAKEAWAYS

- Tax revenue impact is lower than many discretionary grant incentives explored to date (poor targeting and lengthy buildout).
- Need for site locational and industrial targeting due diligence (only 2 megasites conducted market feasibility studies; Automotive megasite study was not supportive of feasibility of automotive megasites in the region).
- Limitations of analysis (e.g., development cost based "but for" computations may not reflect full firm value of conveyed business-ready sites or discretionary nature of the incentives)

REMAINING QUESTIONS

- How do market prices of developed industrial land vary from development costs? (If higher “but for” of in-kind contribution is higher)
- How are vacated business sites by local firms that move into industrial parks utilized (are they filtered down to other firms or remain vacant or underutilized in slow growth communities)?
- What are the attributes of public parks and communities related to absorption (e.g., private/public ownership, pricing strategies, amenities, other site availability, development costs, zoning laws)?
- How limited are developable business and industrial sites by region?
 - State industrial park inventory and Costar data
- What role does availability of sites have on firm location decisions?
 - Local economic developers rate business ready site shortage as constraint to development and Virginia as only “average” vs. other states) but other workforce and infrastructure (e.g., telecommunications and highways) are rated as more significant constraints
 - Firm survey found no evidence that site shortage was a factor in location/expansion decisions (though question was not explicit).
- What kinds of firms locate in industrial parks (e.g., export-base industries)
 - Potentially use park boundary files and geocoded confidential QCEW employment data to explore.