

ECONOMIC DEVELOPMENT INCENTIVE DEADWEIGHT: THE ROLE OF PROGRAM DESIGN FEATURES, FIRM CHARACTERISTICS, AND LOCATION

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UNIVERSITY
of
VIRGINIA



OUTLINE OF PRESENTATION

- Study Background
- Virginia Economic Development Incentives
- Firm Economic Development Incentives Survey
- Hypotheses
- Data and Statistical Methodology
- Results
- Implications

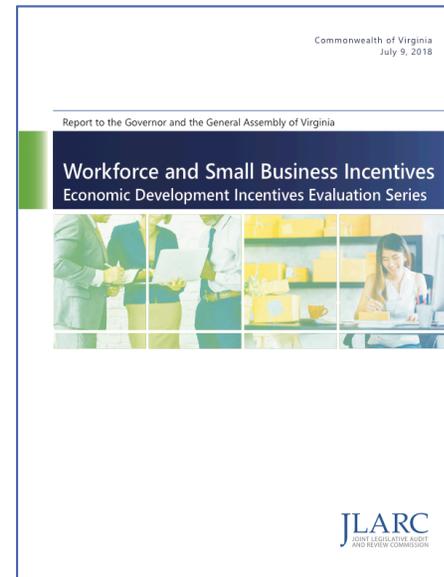


STUDY BACKGROUND



JOINT LEGISLATIVE AUDIT AND REVIEW COMMISSION ECONOMIC INCENTIVE EVALUATION

- Two annual reports
 - Comprehensive incentives report
 - Report on rotating group (3-12) of individual incentives
 - FY17. Film incentives
 - FY18. Small business and workforce development
 - FY19. Manufacturing and data center incentives
 - FY20. Infrastructure and distressed region incentives
 - FY21. Trade and transport of goods incentives



EVALUATION COMPONENTS

- Incentive characteristics
 - Targeting (e.g., export orientation, high multiplier, average wages, clusters)
 - Trend and geographical characteristics
- Performance outcome verification
- Program benchmarking with other states
- Economics/policy literature review
- Ex post quasi-experimental analysis using establishment or state industry employment and other data
- Economic and ROI analysis using REMI
- **Surveys, interviews, and focus groups**
 - State agency staff
 - Industry and advocacy groups
 - **Firms**
 - Local economic developers

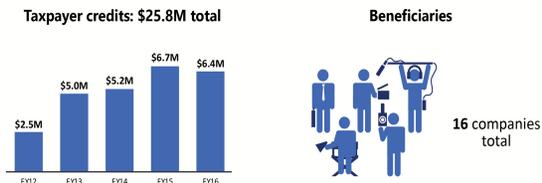
Evaluation: Film Incentives

VIRGINIA MOTION PICTURE PRODUCTION TAX CREDIT

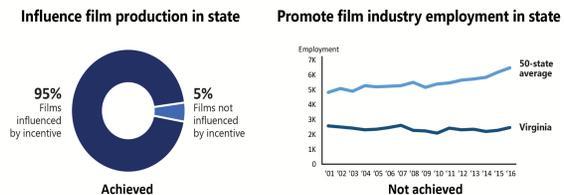
Refundable tax credit for production companies that film in Virginia

VALUE TO BENEFICIARIES

FY12-FY16



ACHIEVEMENT OF PURPOSE



IMPACT TO STATE ECONOMY

average FY12-FY16



NOTE: Adopted 2010 (S 58.1-439.12.03) and expires 2022. Credit amounts are assigned to the year of film production rather than when the credit was claimed and may be higher than the credit cap. The number of taxpayers receiving credits per year cannot be reported. Credits were claimed on fewer than four returns in some years and cannot be disclosed.

PURPOSES OF SURVEY

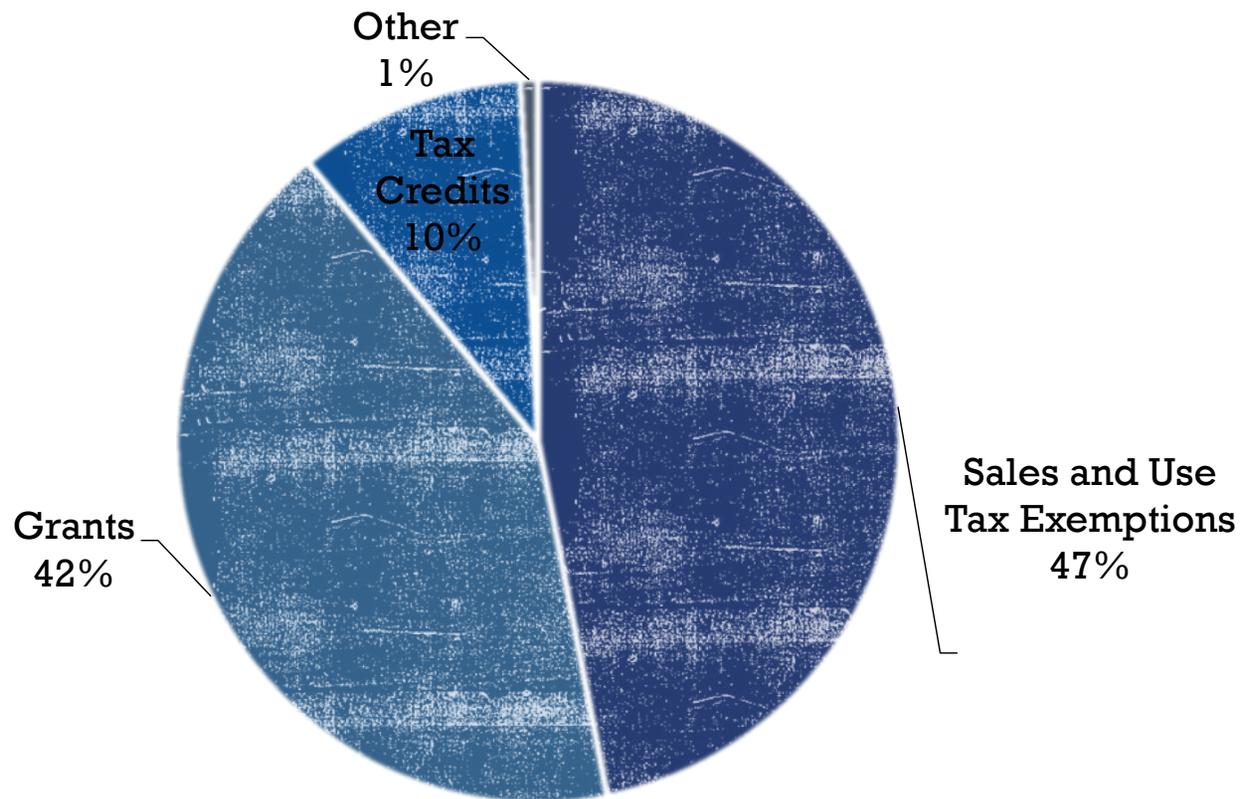
- To conduct “but for” analysis for program evaluation
- To gauge importance of incentives relative to other locational factors (e.g., workforce quality, transportation)
- To evaluate experience and satisfaction with selected individual programs (i.e., loan programs, workforce development)
- To understand usage, magnitude, and importance of local incentives
- To get open-ended feedback on economic incentive programs and state economic development strategy
- ***To obtain data for research purposes (e.g., identifying characteristics of effective incentive)***



VIRGINIA ECONOMIC DEVELOPMENT INCENTIVES



GRANTS AND TAX CREDITS MAKE UP HALF OF TOTAL INCENTIVE VALUE



MANY PROGRAMS, AGENCIES, AND PERFORMANCE METRICS

- Over 70 programs
- 12 different agencies administer programs
 - Limited project performance measurement coordination
 - Difficult to identify joint projects independently because firm ID, dates, metrics, outcomes rarely align
- Multiple metrics
 - Job creation and capital expenditures most common
 - Capital expenditures and jobs often measured differently
 - Some metrics not economically relevant (carloads, port usage)

Grant program	Job creation	Wages	Capital expenditures	Other
Aerospace Engine Manufacturing Performance Grant Program (Rolls-Royce)	X	X	X	
Agriculture and Forestry Industries Development Grant	X	X	X	Value of Virginia agricultural products produced
Advanced Shipbuilding Production Facility Grant Program (Newport News)	X		X	
Advanced Shipbuilding Training Facility Grant Program (Newport News)	X	X	X	
Commonwealth's Opportunity Fund	X	X	X	
Commonwealth Research Commercialization Fund				Capital attracted from other sources
Coalfield Region Opportunity Fund	X	X	X	
Economic Development Access Program			X	
Growth Acceleration Program				Capital attracted from other sources
Governor's Motion Picture Opportunity Fund	X			Total Virginia spending Value of advertising
Major Eligible Employer Grant	X	X	X	
Port of Virginia Economic & Infrastructure Grant	X			Port user
Pulp, Paper, and Fertilizer Advanced Manufacturing Grant Program	X		X	
Rail Industrial Access Program			X	Carloads
Small Business Investment Grant Fund	X			
Small Business Jobs Grant Fund Program	X	X	X	
Semiconductor Custom Grant (Micron)	X		X	
Semiconductor Custom Grant (Qimonda)	X	X	X	
SRI custom grant	X	X		
Tobacco Commission Megasite Grant	X			Industrial park acreage and sites
Tobacco Region Opportunity Fund	X	X		
Transportation Partnership Opportunity Fund	X		X	
VALET Program				International sales
Virginia Economic Development Incentive Grant	X	X	X	
Virginia Investment Partnership Grant	X	X	X	
Virginia Jobs Investment Program	X	X	X	
Virginia Tourism Growth Fund	X		X	



FIRM ECONOMIC DEVELOPMENT INCENTIVES SURVEY

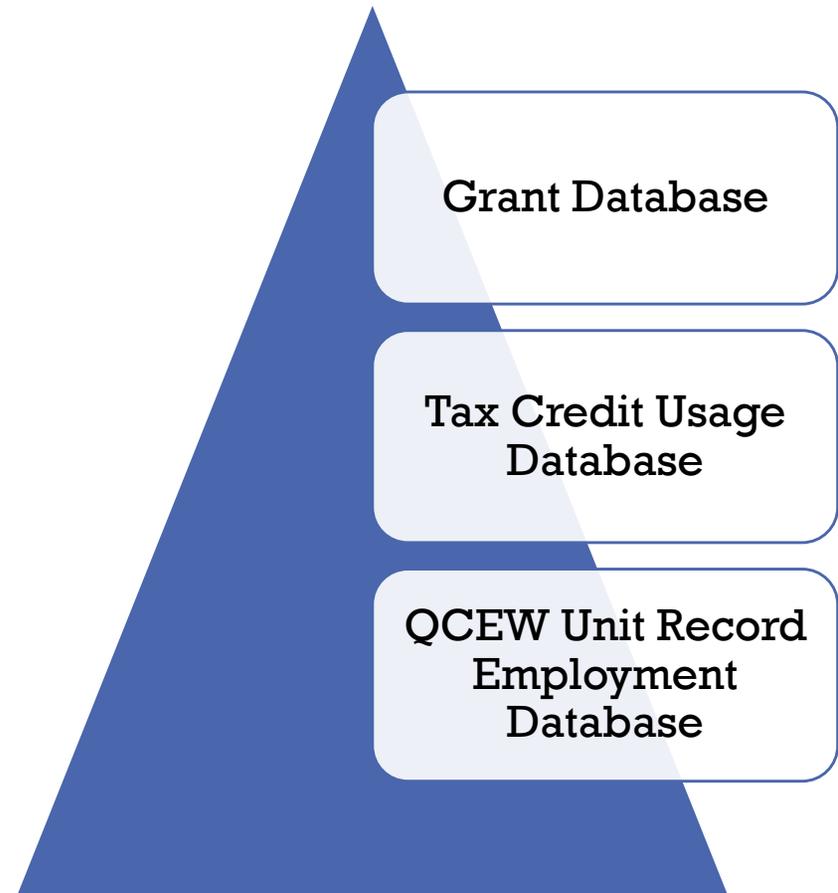


DEADWEIGHT

- Types of studies estimating deadweight
 - Hypothetical firm simulation (Fisher and Peters 1998?)
 - Ex post estimation of incentive effect on business activity (Faulk; Brown and Earle 2017)
 - Elasticity simulation (Bartik 2018)
 - Survey-base firm self assessments (assumed to provide high end estimates)
 - Others (credit scoring, expert analysis, market gap id, Jensen)
- Types of studies estimating possible program, firm, and location influences on deadweight
 - Econometric estimation with interaction variables, multilevel modelling
 - Multiple regression analysis of firm deadweight estimates

DESCRIPTION OF SURVEY

- 1,300 surveys total
- Online (Qualtrics) delivery with mail, e-mail, & phone contacts
- 1,000 surveys to incentivized firms
 - Project records with contact info for every grant
 - Maximum of 100 projects per incentive for sample heterogeneity but allow possibility of capturing program-specific information
- Contact information for tax credit and non-incentive firms obtained by combining with ES-202 data



“BUT FOR” QUESTION

- Key “But for” question
- Use in previous European studies
 - Lenihan (2004); Lenihan and Hart (2006) (Ireland)
 - Tokila and Haapanen (2011); Tokila, Haapanen and Ritsilä (2008) (Finland)
- If incentives had not been available, what would have been effect on project?
 - (a) proceeded with project as planned
 - (b) proceeded at a later date, but scale of project would be the same
 - (c) proceeded on a smaller scale (Estimate % of final project scope)
 - (d) Canceled the project(s)
 - (e) Proceeded at an out-of-state location

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Now we are asking about all of the incentives your business was awarded (as selected in A3 above).

A4. For what type(s) of project was the economic development incentive(s) used? [Select all that apply]

- Start up a new firm or business
- Expand an existing facility
- Support or retain existing operations or facility
- Relocate an existing facility
- Open an additional facility
- Other (Please describe _____)

A5. If the state economic development incentive(s) had not been available for your firm, what would have been the effect on your incentive-assisted Virginia project(s)?

- 1 Proceeded with the project(s) as planned
- 2 Proceeded at a later date, but the scale of the project would have been the same
- 3 Proceeded on a smaller scale (Estimated percentage of final project(s) scope _____)
- 4 Canceled the project(s)
- 5 Proceeded at an out-of-state location

A6. How important was/were the economic development incentive(s) in allowing your firm to:

	Not important at all	Not very important	Somewhat important	Very important	Not Applicable
a. Create new jobs	1	2	3	4	
b. Retain existing jobs	1	2	3	4	
c. Invest in machinery and equipment	1	2	3	4	9
d. Conduct research and development	1	2	3	4	9
e. Expand your current facilities	1	2	3	4	
f. Create new facilities in VA	1	2	3	4	9
g. Export additional products or services	1	2	3	4	9
h. Leverage additional debt and/or equity capital	1	2	3	4	9
i. Increase profitability	1	2	3	4	
j. Remain in business in VA	1	2	3	4	
k. Increase economic value of the firm	1	2	3	4	
l. Other (Specify _____)	1	2	3	4	

A7. Were any of the economic development incentives your firm received in SFY 2010-2016 used for worker training?

- 1 Yes
- 2 No (skip to A8, page 7)
- 3 Do not know (skip to A8, page 7)

5

40.1% OF FIRMS WOULD NOT HAVE PROCEEDED WITH PROJECT(S) EXCEPT FOR INCENTIVE(S)

“IF INCENTIVE(S) HAD NOT BEEN AVAILABLE, WHAT WOULD HAVE BEEN EFFECT ON PROJECT?”

Response	Number	%
Proceeded with project as planned	41	26.8
Proceeded at a later date, but scale of project would be the same	16	10.5
Proceed on a smaller scale (Estimate %)	49	32.0
Canceled the project(s)	33	21.6
Proceeded at an out-of-state location	15	9.2
Total	153	100.0

OTHER STATE SURVEYS “BUT FOR” PERCENTAGES*

Study	State	Type of incentive	N	”But for” %
Jensen (2017a)	KS	Payroll credit	24	20.8
Florida OPPAGA (2015)	FL	Investment tax credits	8	6.3
Florida OPPAGA (2015)	FL	Sales tax credits	8	37.5
Florida OPPAGA (2015)	FL	Wide variety	74	57
Lynch, Fishgold, & Blackwood (1996)	NY	Property tax break	29	31
Unweighted Average				34.8
Weighted Average				41.7
VA JLARC Survey				40.1

Source: Based on surveys reviewed by Bartik (2018) “But For” Percentages for Economic Development Incentives: What percentage estimates are plausible based on the research literature” Upjohn Institute Working Paper 18-289.

* Note: Surveys will produce positive bias.

SAMPLE CHARACTERISTICS

Feature	Population	Sample	Respondents
Grant Use	89.6%	77.5%	85.6%
Tax Credit Usage	8.0%	17.3%	7.2%
Loan Usage	4.8%	11.0%	11.8%
Discretionary Program Usage	28.7%	53.5%	68.0%
Competitive Program Usage	6.0%	8.7%	5.2%
2 or more program usage	13.5%	23.3%	28.8%
<\$50,000	38.5%	38.0%	44.4%
\$50,000-\$99,999	25.0%	19.2%	22.9%
\$100,000-\$249,999	22.5%	19.8%	17.7%
\$250,000-\$499,999	7.3%	11.7%	7.8%
\$500,000-\$999,999	3.6%	6.0%	4.6%
\$1,000,000 or more	3.1%	5.2%	2.6%
Mean Incentives Value	\$220,836	\$353,949	\$182,415
Number of firms	2,301	999	153

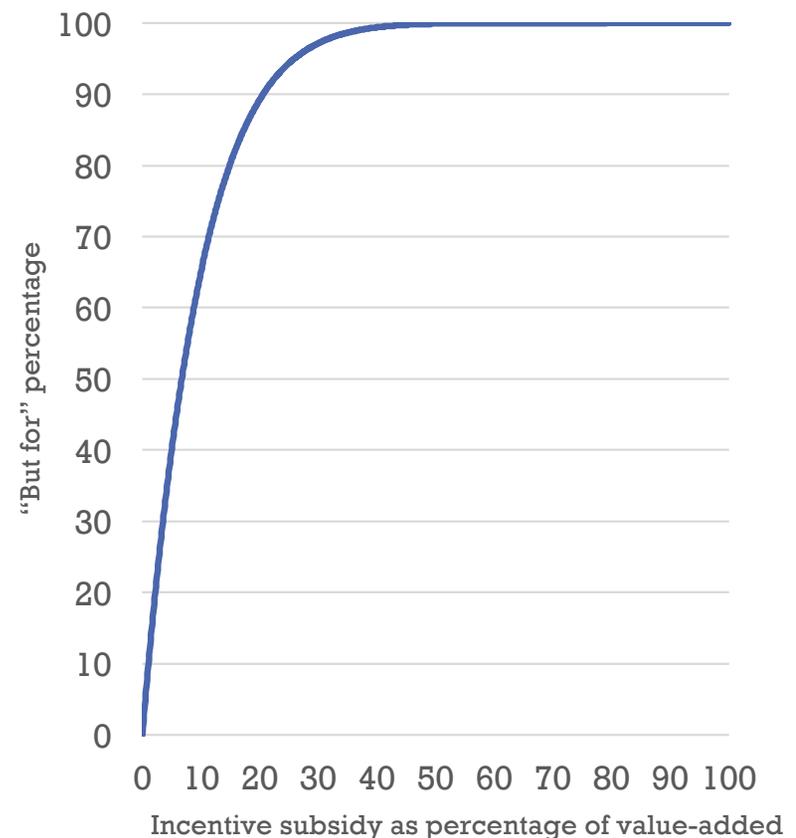


HYPOTHESES



HYPOTHESES—PROGRAM CHARACTERISTICS

- Deadweight is smaller for:
 - #1 Large awards in relation to project size
 - #2 Discretionary (as opposed to automatic) incentives
 - #3 Programs that address identifiable market failures (e.g., public goods, externalities, information imperfections)



HYPOTHESES—FIRM AND LOCATION CHARACTERISTICS

Location

- Deadweight is smaller for:
 - #4 State boundary regions
 - #5 Rural or economically distressed regions

Firm

- Deadweight is smaller for:
 - #6 Small (as opposed to large businesses)
 - #7 New locations/relocations (versus in-situ expansions)
 - #8 Businesses in "footloose" industries
 - #9 *Firms that searched for alternative out-of-state locations*



DATA AND STATISTICAL METHODOLOGY



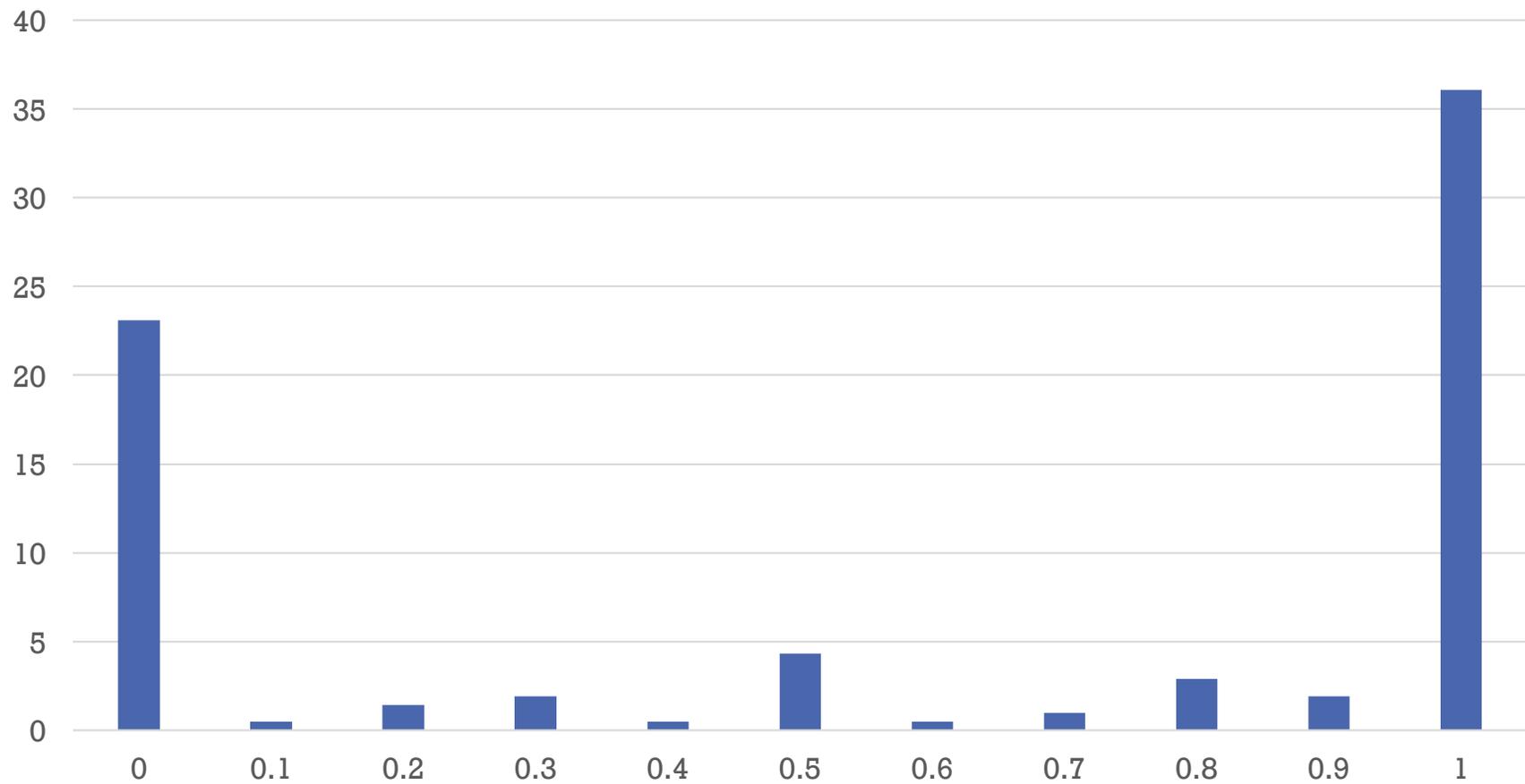
VARIABLES USED IN ANALYSIS

Variable	Description
<i>DEADWEIGHT</i>	Firm assessment of likelihood project would have occurred without incentives (0-1)
<i>AWARD_SIZE</i>	Relative size of incentive (0-100%)
<i>DISCRETION</i>	Portion of total awards from discretionary programs (0-1)
<i>MKTFAIL</i>	Portion of total awards from programs that address market failure (0-1)
<i>NOMETRO</i>	Project located in nonmetro county (0,1)
<i>BOUNDARY</i>	Project located in state boundary county (0,1)
<i>FOOTLOOSE</i>	Footloose industry(0-1)
<i>LOCATE</i>	Relocation/location versus startup (0,1)
<i>LEMP</i>	Log of firm employment in state
<i>SEARCH</i>	Firm indicated that they considered alternative sites in

DEADWEIGHT MEASURE

- If incentives had not been available, what would have been effect on project?
 - (a) proceeded with project as planned
 - (b) proceeded at a later date, but scale of project would be the same
 - (c) proceeded on a smaller scale (Estimate %)
 - (d) Canceled the project(s)
 - (e) Proceeded at an out-of-state location
- GLM (proportion analysis), Family(binomial), Link(Logit). (a) and (b) coded as one. (c) scale estimate used (>0 and <1)
- Other measures used (e.g., logit and ordered logit) but didn't change results.

DEPENDENT VARIABLE IS A PROPORTION





RESULTS



GLM REGRESSION (RATIO) RESULTS

Variable	Coef	dy/dx	Std. Dev.	z	P value
<i>AWARD_SIZE</i>	-0.0010025	-0.0002389	0.00309	-0.08	0.094
<i>DISCRETIONARY</i>	-1.125827	-0.2682846	0.09907	-2.71	0.007
<i>MKTFAIL</i>	0.3028713	0.0721743	0.12853	0.56	0.0574
<i>NONMETRO</i>	-0.304962	-0.0726725	0.14912	-0.49	0.626
<i>BOUNDARY</i>	-0.388846	-0.0092662	0.10114	-0.09	0.927
<i>FOOTLOOSE</i>	0.3815175	0.0886237	0.09084	0.88	0.329
<i>LOCATE</i>	0.1271865	0.0299588	0.12036	0.25	0.803
<i>LEMP</i>	0.0736483	0.075504	0.03154	0.56	0.578
<i>SEARCH</i>	-1.28006	-0.3077571	0.08809	-3.49	0.000
<i>CONSTANT</i>	0.9751677				

34.7% (40.1% BEFORE) OF FIRMS WOULD NOT HAVE PROCEEDED WITH PROJECT(S) EXCEPT FOR INCENTIVE(S) ADJUSTING FOR SAMPLE BIAS

“IF INCENTIVE(S) HAD NOT BEEN AVAILABLE, WHAT WOULD HAVE BEEN EFFECT ON PROJECT?”

Response	Before	After
Proceeded with project as planned	26.8	31.7
Proceeded at a later date, but scale of project would be the same	10.5	19.1
Proceed on a smaller scale (Estimate %)	32.0	33.5
Canceled the project(s)	21.6	16.9
Proceeded at an out-of-state location	9.2	8.9
Total	100	100.0



IMPLICATIONS



SEVERAL TAKEAWAYS

- Survey estimates of “but for” will be positively biased but may potentially reveal useful information about effect of incentive design
- Firm self assessment of incentive impact not linked to most firm, industry, or locational characteristics
- Impact is associated with one program attribute: ***discretionary decision process***
 - Only 27.3% of Virginia incentive spending FY10-FY17 was on programs having this feature.
- Effectiveness is linked to whether firm undertook search process. Programs that fund only ***competitive projects*** may have lower deadweight.
 - Only 14.7% of Virginia incentive spending FY10-FY17 has this feature.

WHAT DO WE MEAN DISCRETION AND COMPETITION?

Discretion

- Elements of discretion:
 - (a) project scoring process related to need with cutoffs
 - (b) due diligence/vetting process
 - (c) administrative and/or committee oversight of final decisions
 - (d) local match (skin in the game)
 - (e) application yield rates much lower than 100%
 - (f) competitive project funding

Competition

- *“Competitive Projects Only: There must be an active and realistic competition between Virginia and another state or country for attracting the project. Grants are made with the expectation that the award of the grants will result in a favorable decision for Virginia.”*