




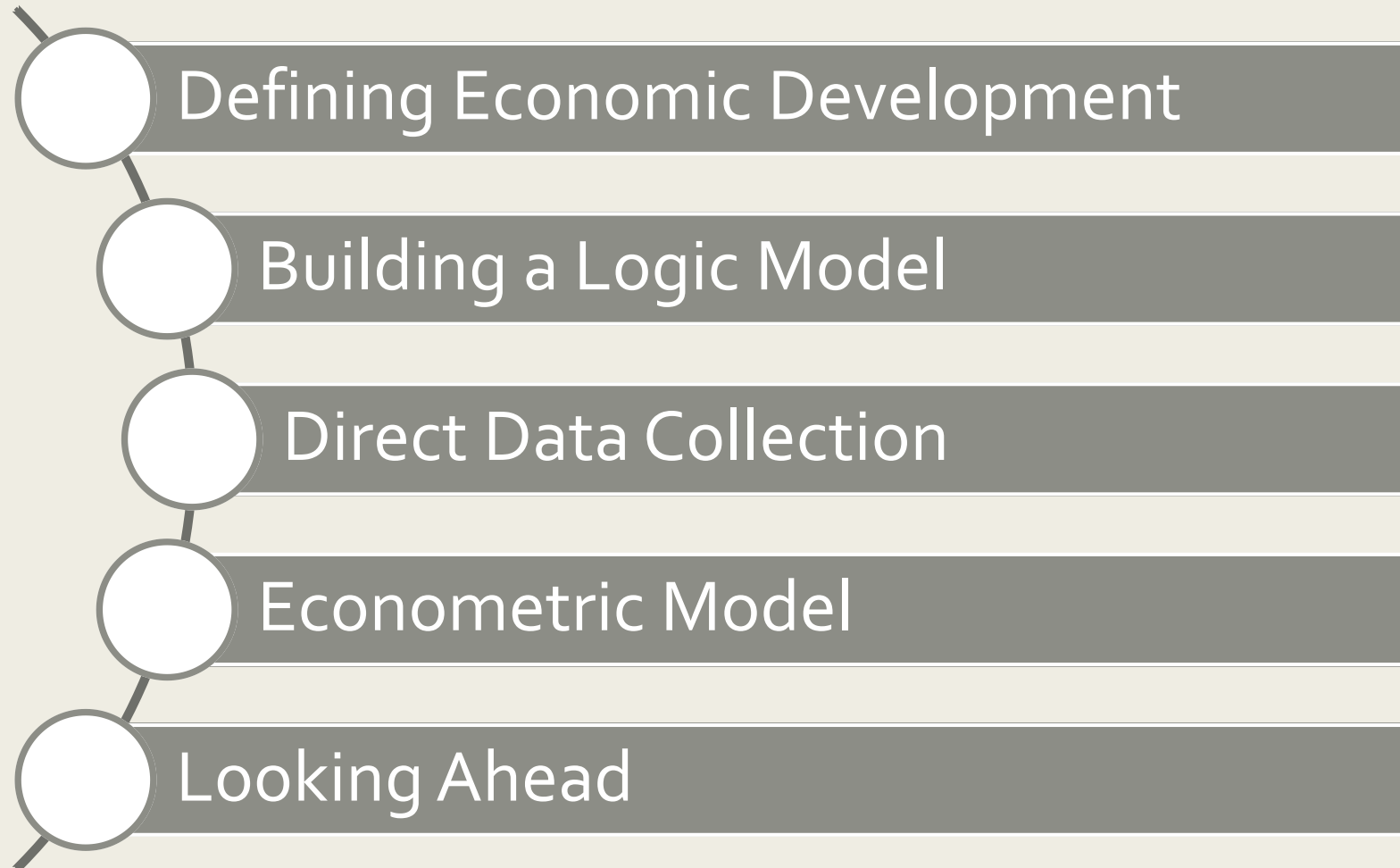
# INNOVATIVE METRICS FOR ECONOMIC DEVELOPMENT

Laura Ross, SRI International  
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In a world driven by evidence, data, and impact – how do you measure a concept such as economic *development*?

# Agenda



# Economic Development and Economic Growth *are not* one in the same

Economic Growth =  
Jobs, Earnings, Income

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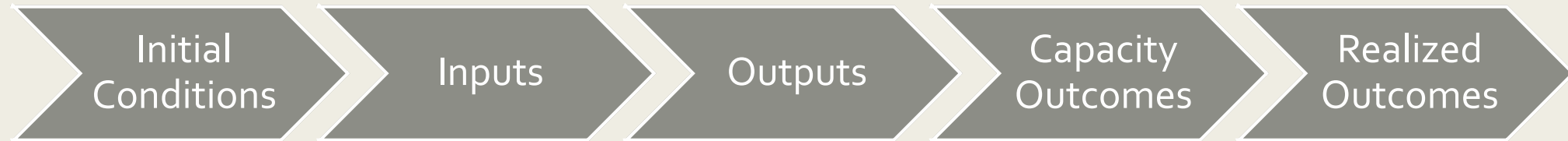
Economic Growth =  
Jobs, Earnings, Income

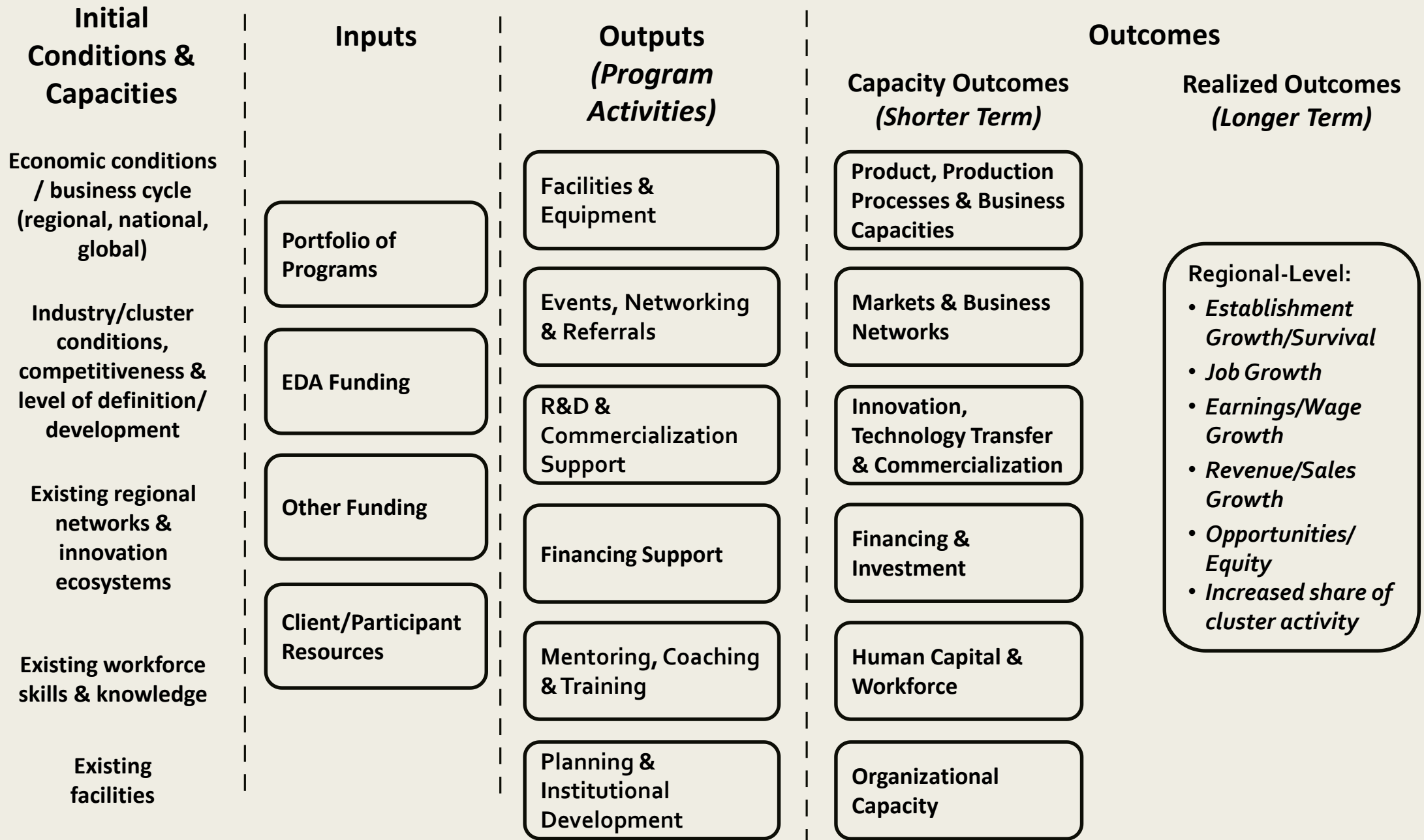
Economic Development =  
???

# A new definition of economic development – focused on “capacities”

*Economic development creates the conditions for economic growth and improved quality of life by expanding the **capacity** of individuals, firms, and communities to maximize the use of their talents and skills to support innovation, lower transaction costs, and responsibly produce and trade valuable goods and services.*

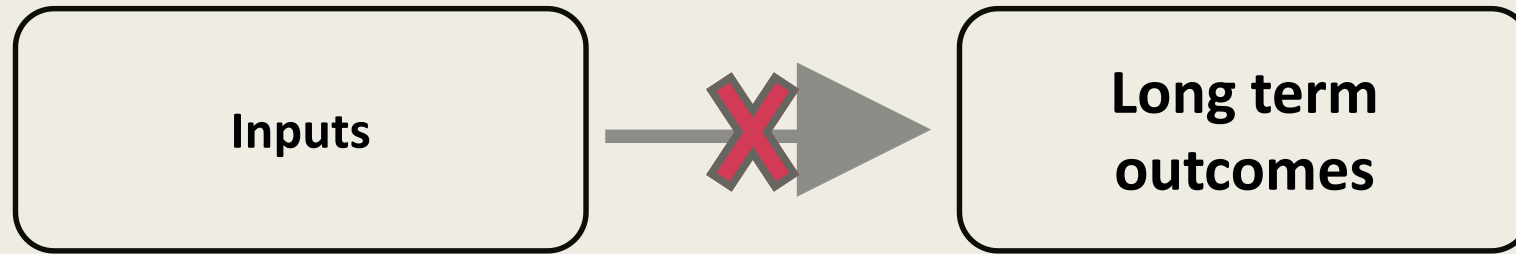
# Modeling Economic Development Programs via Logic Model







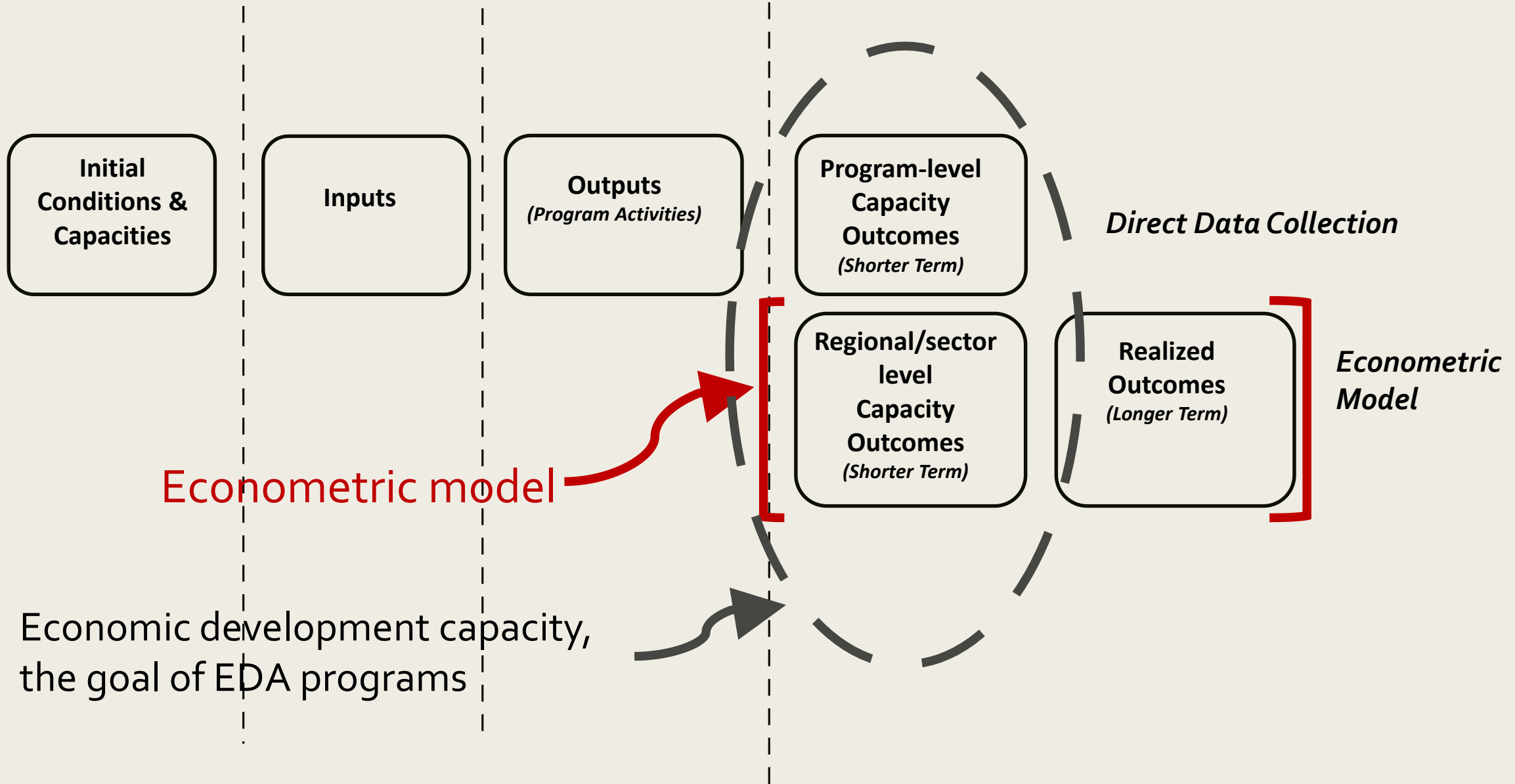
# Primary challenge: difficulty in connecting inputs with long-term outcomes



Small dollar figure grants

Hard to collect data on long-term impact after program ends

Aggregate, regional-level impacts unlikely to be directly affected by any individual grant/program



Econometric model

Economic development capacity,  
the goal of EDA programs

Direct Data Collection

Econometric Model

# Project hinges on the intersection of direct data collection and an econometric model

## Direct Data Collection:

Create survey instrument and toolkit to directly collect data from economic development grantees, in order to evaluate impact of grants on Program Outputs and Capacity Outcomes at the individual program level

## Econometric Model:

Develop an econometric model to examine and validate the relationships between Capacity Outcomes and long-term Realized Outcomes at the aggregate regional level

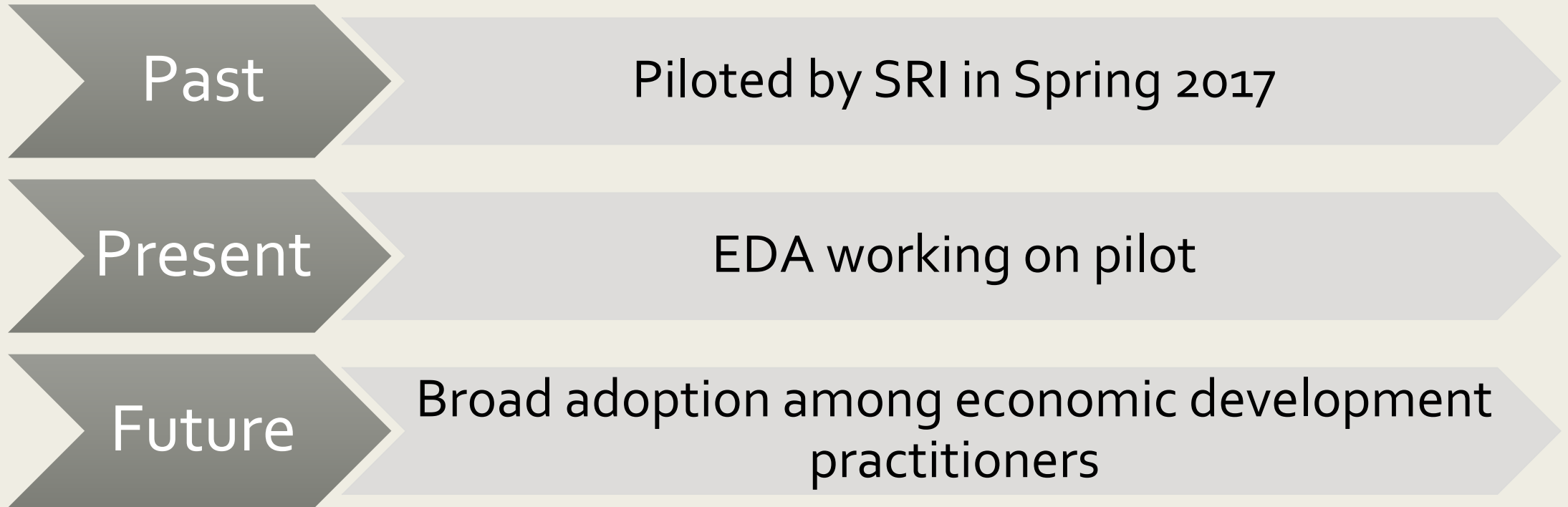
# Direct Data Collection to assess outputs and short-term outcomes

## Direct Data Collection:

Create survey instrument and toolkit to directly collect data from economic development grantees, in order to evaluate impact of grants on Program Outputs at the individual program level

- Surveys designed for use across a broad range of programs and grantee organizations
- Intended to capture both high-level reflections of impact, as well as detailed reporting of activities and outcomes
- Two separate instruments:
  - Program Outputs Survey – for grantee recipients
  - Capacity Outcomes Survey – for clients or beneficiaries
- Associated toolkit introduces the logic model, defines the metrics being collected, and provides guidance on implementation

# Status and future of survey



# Econometric Model to explore relationships

## Econometric Model:

Develop an econometric model to examine and validate the relationships between Outcomes at the aggregate regional level and long-term outcomes

- Model examining relationships between Capacity Outcomes and Realized Outcomes
- Relying primarily on third-party, publicly available data
- Two sets of findings:
  - Capacity Variables
  - Network Infrastructure

# Identifying Indicators

## Product, Production Processes & Business Capacities

- New Product Introductions (from ThomasNet, proxy measure of process innovation)

## Markets & Business Networks

- Number of Membership Associations & Organizations (from BLS QCEW, proxy measure of social capital)

## Innovation, Technology Transfer & Commercialization

- Number of Patents Awarded (from USPTO, proxy measure of innovation)

## Financing & Investment

- Number of SBIR/STTR Awards (from SBA, measure of public R&D finance)
- Number of Venture/Angel/Seed Capital Deals (from PitchBook, measure of private capital raised)

## Human Capital & Workforce

- Establishment Churn Rate (data from Census SUSB, proxy measure of regional dynamism)
- Number of Non-employer Firms (from CENSUS SUSB, proxy measure of entrepreneurial skills)
- Creative Class Share (from USDA ERS, proxy measure of regional capacity)

## Organizational Capacity

- Number of Nonprofit Community & Economic Development Organizations (from Guidestar, proxy measure of regional capacity)

# Exploring the relationship between Capacity Outcomes and Realized Outcomes

$$Outcome = B_0 + B_i(\text{controls}_i) + B_j(\text{capacity}_j) + e$$

- Controls:
  - *Employment, 2000*
  - *Log Population, 2000*
  - *Manufacturing Share of the Economy, 2000*
  - *Educational Attainment, 2000*
  - *Per Capita Income, 2000*
  - *Unemployment Rate, 2000*
  - *Earnings, 2000*
- Capacities: from earlier slide
  - *Normalized*
  - *2005- 2007*
- Realized Outcomes:
  - *Earnings, % change 2010-2015*
  - *Employment, % change 2010-2015*
  - *Per Capita Income, % change 2010-2015*
- Unit of Analysis: CBSA



# Analysis found some key relationships, and suggested differences between metro and micro regions

- Identified relationships between **Markets and Business Networks**, **Financing and Investment**, and **Human Capital and Workforce**, and long term outcomes
- Capacities without demonstrated relationships – hope to pursue further work with new data sources to test relationships
- Analyses also suggested important differences between metropolitan and micropolitan regions

# Exploring the importance of network support structures

- Initial analyses sparked a new hypothesis: some of the capacity variables act as direct economic drivers, while other variables act as institutional support structures for other types of economic activity
  - *Direct effect economic drivers: Patents, new product introductions, establishment churn, non-employer firms, financing events, SBIR/STTR grants*
  - *Institutional support structures: membership organizations and associations, economic development organizations, and federal investment*
- To investigate, created a network infrastructure variable representing the combined impact of institutional support structures

# Network infrastructure matters in micropolitan regions

- Network Infrastructure = EDOs\*Membership Orgs\*EDA Grants
- Analysis showed that the presence of network infrastructure in a region was positively correlated with long-term earnings growth, in both the combined metro/micro analysis, and also in just the micropolitan regions
- Economic development grants can serve a critical role in developing this type of infrastructure to support economic development initiatives

# Key finding: differences between metro and micro regions

**Metro:** Key capacities were establishment churn, non-employer firms, and financing events

- Suggests that the level of activity is an important indicator of future growth
- These regions could support higher rates of creative destruction

**Micro:** Key capacities were patents, membership associations and organizations, and creative class share of the workforce

- Suggests that inventiveness and creativity are important indicators of future growth
- Regional characteristics are more important than level and quantity of activity

# Looking ahead: paths for continued exploration

- SRI is continuing to advance this approach to understanding the relationship between regional capacities and long –term realized outcomes
  1. *Developing an article for publication*
  2. *Working with EDA to identify potential data sources and new collection methods to improve available indicators for capacity outcomes*
  3. *Supporting the implementation of the survey instrument for direct collection of data from grantees*

# Thank you!

## Questions?

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BACKUP SLIDES



<b>Product, Production Processes, and Business Capacities</b>	New Product Introductions	
<b>Markets and Business Networks</b>	Membership Associations and Organizations	
<b>Innovation, Technology Transfer, and Commercialization</b>	Patents	
<b>Financing and Investment</b>	SBIR/STTR Grants	
	Financing Events	
<b>Human Capital and Workforce</b>	Establishment Churn	
	Non-Employer Firms	
	Creative Class Share	
<b>Organizational Capacity</b>	Economic Development Organizations	



<b>Product, Production Processes, and Business Capacities</b>	New Product Introductions	
<b>Markets and Business Networks</b>	Membership Associations and Organizations	<b>Earnings</b>
<b>Innovation, Technology Transfer, and Commercialization</b>	Patents	
<b>Financing and Investment</b>	SBIR/STTR Grants	
	Financing Events	<b>Earnings Employment</b>
<b>Human Capital and Workforce</b>	Establishment Churn	<b>Employment</b>
	Non-Employer Firms	<b>Employment Per Capita Income</b>
	Creative Class Share	<b>Employment</b>
<b>Organizational Capacity</b>	Economic Development Organizations	

<b>Product, Production Processes, and Business Capacities</b>		
<b>Markets and Business Networks</b>	Membership Associations and Organizations	<b>Earnings</b>
<b>Innovation, Technology Transfer, and Commercialization</b>		
<b>Financing and Investment</b>		
	Financing Events	<b>Earnings Employment</b>
<b>Human Capital and Workforce</b>	Establishment Churn	<b>Employment</b>
	Non-Employer Firms	<b>Employment Per Capita Income</b>
	Creative Class Share	<b>Employment</b>
<b>Organizational Capacity</b>		

# Both metro micro

	Earnings	Employment	Per Capita Income
Patents			
New Product Introductions			
Establishment Churn	Medium	Strong	
Non-Employer Firms		Strong	Strong
SBIR/STTR		Strong	Medium
Financing Events	Strong	Strong	
Associations/Organizations	Strong		
EDOs		Strong	Medium
Creative Class Share		Strong	Medium

# Metro Only

	Earnings	Employment	Per Capita Income
Patents			
New Product Introductions		Medium	
Establishment Churn	Strong	Strong	
Non-Employer Firms			Strong
SBIR/STTR		Medium	Medium
Financing Events	Strong	Strong	Strong
Associations/Organizations			
EDOs			
Creative Class Share			Medium

# Micro Only

	Earnings	Employment	Per Capita Income
Patents	Medium		
New Product Introductions			
Establishment Churn	Medium		
Non-Employer Firms		Strong	Strong
SBIR/STTR		Medium	
Financing Events			
Associations/Organizations	Strong		
EDOs		Strong	
Creative Class Share		Strong	

# Detailed Variable Information – Controls

Variable Abbreviation	Long Name	Description	Source
Employment 2000	Employment, 2000	Employment levels of the MSA in 2000	BLS LAUS
Earnings, 2000	Earnings, 2000	Average annual pay of wage and salary workers, in 2000	BLS QCEW
Log Pop, 2000	Log Population, 2000	Log Population count of the MSA	Census
Mfg Share, 2000	Manufacturing as a Share of the Economy, 2000	Manufacturing jobs as a percent of total jobs in the metropolitan/ micropolitan economy	BLS QCEW
% Bachelors Plus, 2000	Educational Attainment, 2000	Portion of the population 25+ that has a bachelor's degree	Census
Per Capita Inc, 2000	Per Capita Income, 2000	Personal income per capita, as defined by BEA	BEA Local Area Personal Income
Unemp Rate, 2000	Unemployment Rate, 2000	Annual average unemployment rate, not seasonally adjusted	BLS LAUS

# Detailed Variable Information – Capacities

Variable Abbreviation	Long Name	Description	Source
Patents, 05-07	Patents from 2005 – 2007	Number of patents granted in a region between 2005 and 2007	US PTO
Establishment Churn	Establishment Birth and Death Rates, 2006	The annual number of establishment births + deaths in a year, as a share of all establishments at the beginning of the year	Census SUSB
Non-Employer Firms	Nonemployer Firms, Tech Intensive, 2006	As defined by Census, number of firms that have no paid employees and are subject to federal income tax, in tech-intensive industries	Census Nonemployer Statistics
Financing Events	Private Financing Events, 2006	Number of private financing events, such as angel, seed and/or venture capital funding deals	Pitchbook
EDO	Economic Development Organizations, 2006	Number of organizations in a region that are classified by the National Taxonomy for Exempt Entities under the S Community Improvement, Capacity Building code	Guidestar

# Detailed Variable Information – Capacities

Variable Abbreviation	Long Name	Description	Source
Assoc./Orgs (NAICS 813)	Membership Associations and Organizations (NAICS 813), 2006	Number of firms categorized under NAICS 813: Membership associations and organizations	BLS QCEW
SBIR + STTR, 05-07	SBIR and STTR Awards between 2005 and 2007	Number of SBIR and STTR awards granted by SBA	SBA SBIR Database
New Products, Sum 05-07	Sum of new product announcements, 2005-2007	New products announced through ThomasNet	ThomasNet
Creative Class Share	Creative Class share of the workforce, 2007-2011 (pooled)	Share of the workforce employed in occupations that involve a high level of thinking creatively, i.e. developing, designing or creating new applications, ideas, systems or products	USDA Economic Research Service



# Survey Instruments

## **Program Outputs Survey: Fielded to non-infrastructure grantee organizations**

- Asks about number of events held, number of training sessions offered, number of referrals made, etc.
- Questions are bucketed according to the logic model:  
Facilities and Equipment; Events, Networking and Referral; R&D and Commercialization Support; Financing Support; Mentoring, Coaching & Training; Planning and Institutional Development

## **Capacity Outcomes Survey: Fielded to clients and beneficiaries of grantees**

- Asks about hours spent receiving training, new financing deals received, improvements in technology development, etc.
- Questions are bucketed according to the logic model:

# Model Time Period

- Controls: 2000
  - *Census year, pre-Great Recession*
- Capacity Variables: 2006; some aggregated 2005-2007
  - *Prior to the peak of the business cycle before the Great Recession*
- Realized Outcomes:
  - *% Change from 2010-2015*
  - *First full year of recover after Great Recession*