IMPLAN Workshop: Florida Power and Light

Wednesday 21 June

IMPLAN

FPL

WELCOME

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OBJECTIVES

Understanding

- Who, What and Why of economic impact analysis
- Keys terms and concepts
- What and When of feasibility
- Organization and relationship of industries, sectors and commodities

Ability

- Ask the right questions when starting a study
- Identify key background information
- Run a standard economic impact analysis
- Run an ABP using supplemental spreadsheet

economic impact analysis

noun / ek·ə-ˈnɑm·ɪk / ˈɪm·pækt / əˈnæl·ə·sɪs /

Definition: A type of study which estimates the economic impact (in terms of jobs, labor income, taxes, etc.) of an initial change in the local economy.

WHO USES IMPACT ANALYSIS?

Government Agencies and Enterprises

- Tax increases/decreases
- Program cuts, policy analysis, regulations
- Attracting new businesses/justifying tax abatements
- As input into other models (FEAST, JEDI, HAZUS)
- Economic section of Environmental Impact Statements
- Which programs to fund?

WHO USES IMPACT ANALYSIS?

Non-Profit Organizations

- Economic contribution of programs, fundraisers, other special events
- Impacts of new legislation

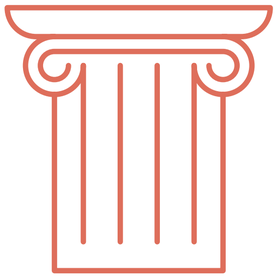
WHO USES IMPACT ANALYSIS?

Private Business

- EB5—Immigration
- TREDIS
- Expansions
- Changes in industry technology, wage rates, tax burden
- Example: Disney in Hawaii

WHO USES IMPACT ANALYSIS?

Colleges and Universities



- Contribution to the local economy
- Economic research
- Consulting work
- Securing funding
- Business partnerships
- Expert testimony

ECONOMIC IMPACT ANALYSIS EXAMPLES

FRAMING THE PROBLEM

- **Who** are the actors?

FRAMING THE PROBLEM

- Who are the actors?
- **What** is the change in production or expenditures?

FRAMING THE PROBLEM

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- What is the change in production or expenditures?
- **When:** In what year is this taking place?

FRAMING THE PROBLEM

- Who are the actors?
- What is the change in production or expenditures?
- When: In what year is this taking place?
- **Where** is it taking place?

FRAMING THE PROBLEM

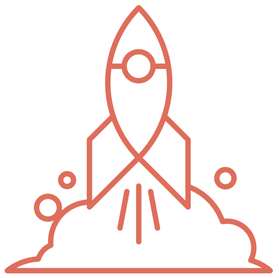
- Who are the actors?
- What is the change in production or expenditures?
- When: In what year is this taking place?
- Where is it taking place?
- **Where** do I want to see my impacts?

FRAMING THE PROBLEM

- Who are the actors?
- What is the change in production or expenditures?
- When: In what year is this taking place?
- Where is it taking place?
- Where do I want to see my impacts?
- **How much** information do I need from the client to do the analysis?

FRAMING THE PROBLEM

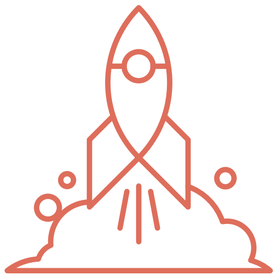
Make a general issue concrete



An aerospace manufacturing company has an increase of $10 million.

FRAMING THE PROBLEM

Make a general issue concrete



An aerospace manufacturing company has an increase of $10 million.

What will the funds be spent on?

- General operations?
- Repairs?
- New construction?
- Salary increases?

FRAMING THE PROBLEM

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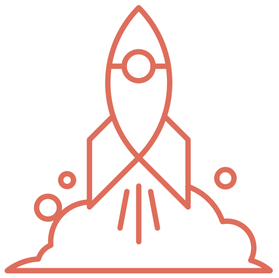


An aerospace manufacturing company has an increase of $10 million.

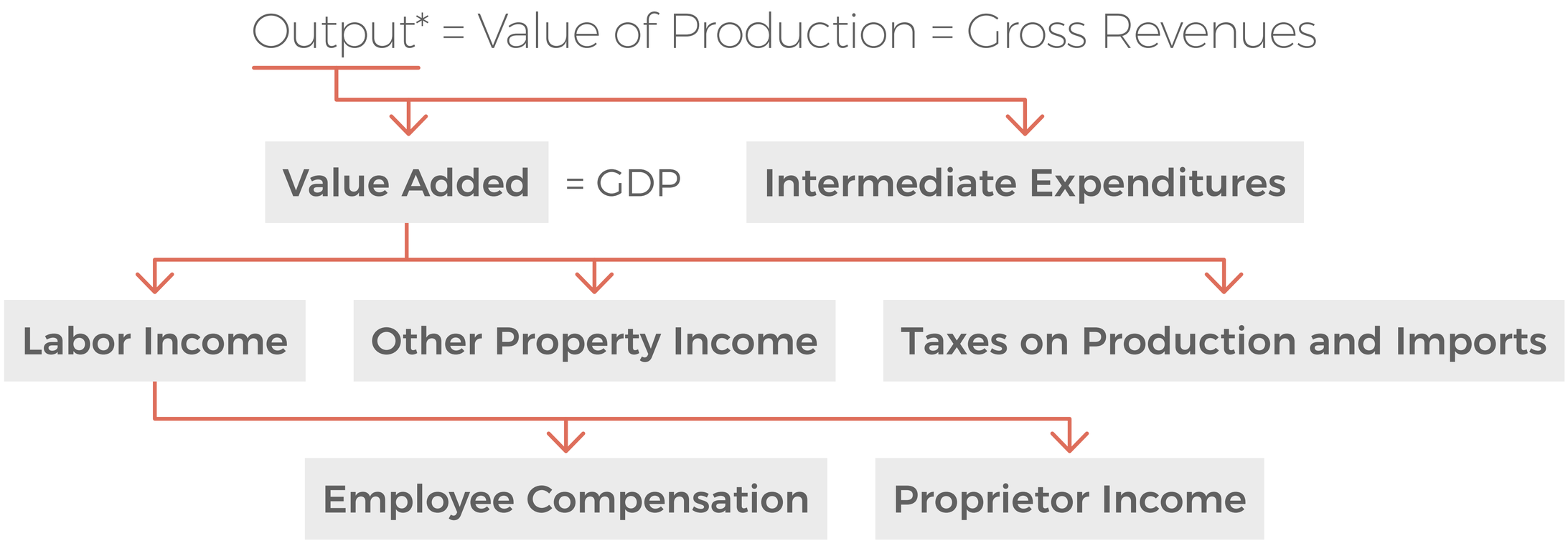
What will the funds be spent on?

- General operations?
- Repairs?
- New construction?
- Salary increases?

Where will the funds come from?

- Taxes?
- Borrowing?

A FEW KEY TERMS



*Output is the largest value and includes everything.

DIGGING INTO VALUE ADDED

Employment Compensation = fully loaded payroll

Proprietor Income = income for sole proprietors or partnerships

- Who are proprietors in our economy?
- What does it mean when:
  - *Proprietor Income is zero?*
  - *Proprietor Income is negative?*

DIGGING INTO VALUE ADDED

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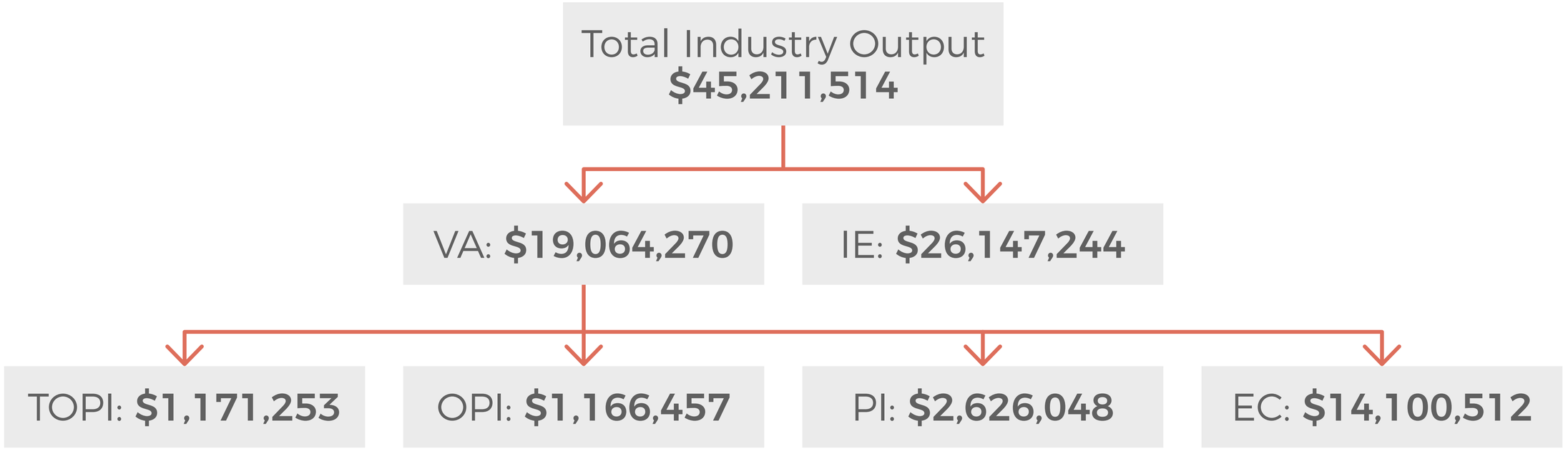
- Who are proprietors in our economy?
- What does it mean when:
  - *Proprietor Income is zero?*
  - *Proprietor Income is negative?*

Can other Value Added factors be negative?

- What would negative Other Property Type Income mean?
- What would negative Taxes on Production & Imports mean?

OUTPUT EQUATION EXAMPLE

Sector 361 Brevard County, FL



SOME KEY TERMS

Regional Purchase Coefficients (RPC)

% of local demand for a commodity that is met by local producers

- ***Example:*** *An RPC of 0.25 for car parts means that 25% of the region's demand for car parts is manufactured locally*
- *Do you think the RPC for fruits and melons would be higher in Alaska or Hawaii?*

Employment

- *Annual average FT/PT jobs*
- *Includes Proprietors*
- *Not FTE*
- *FTE/IMPLAN JobConverter*

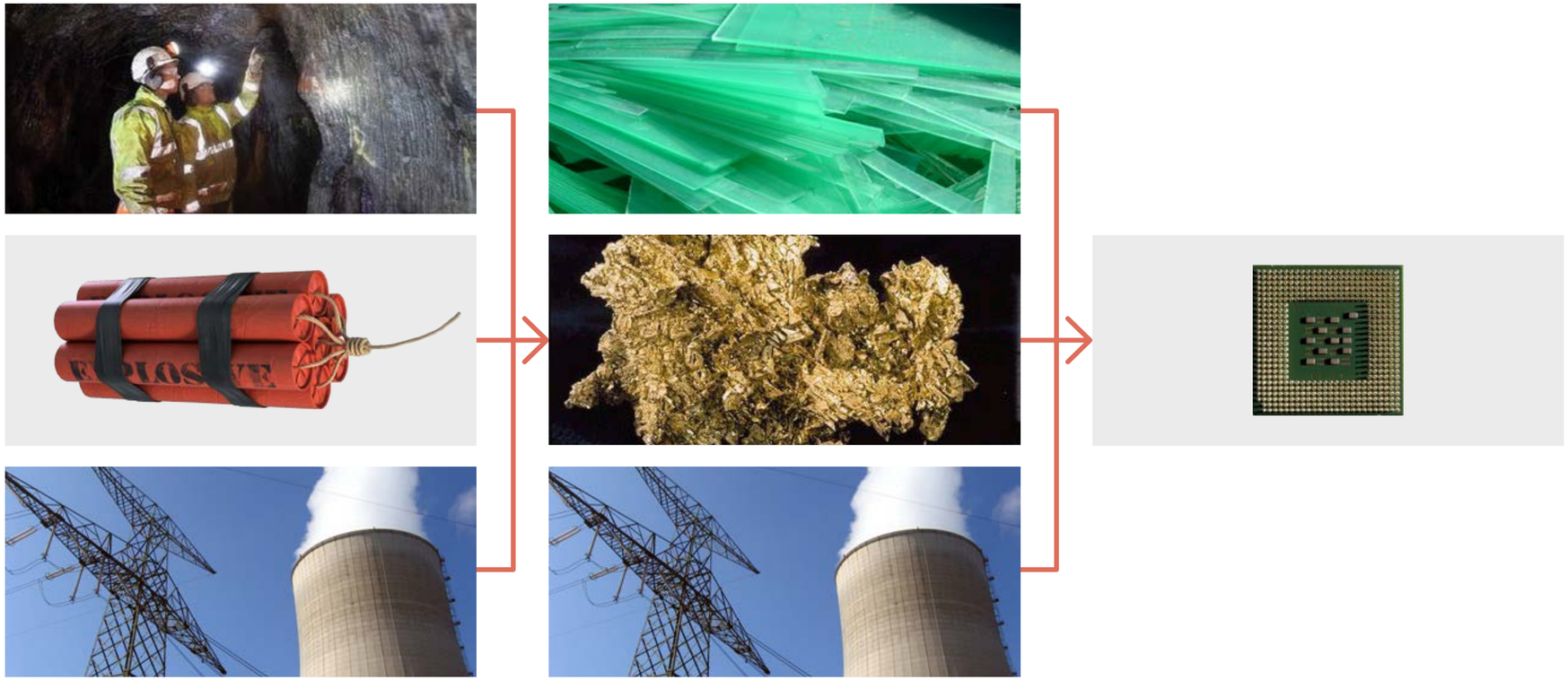
SOME KEY TERMS

Direct Effect: The initial change in production, expenditures, Employment or Labor Income dollars

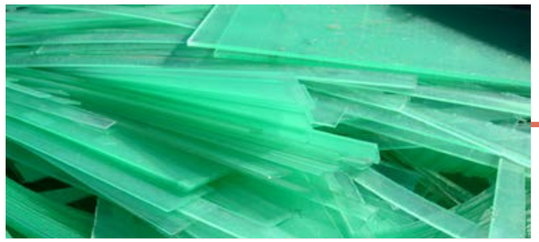
Indirect Effects: Stem from input purchases

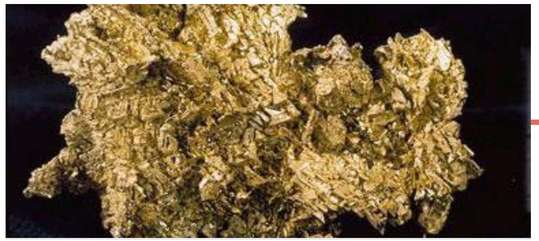
- *To increase production, the directly-affected sector must purchase more inputs—these are the first round of indirect effects*
- *The firms that supply these inputs must now purchase more of their own inputs to meet the new demand for their output—these are the additional rounds of indirect effects*

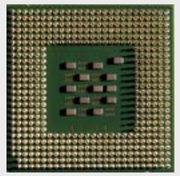
INDIRECT EFFECTS



LINKAGES

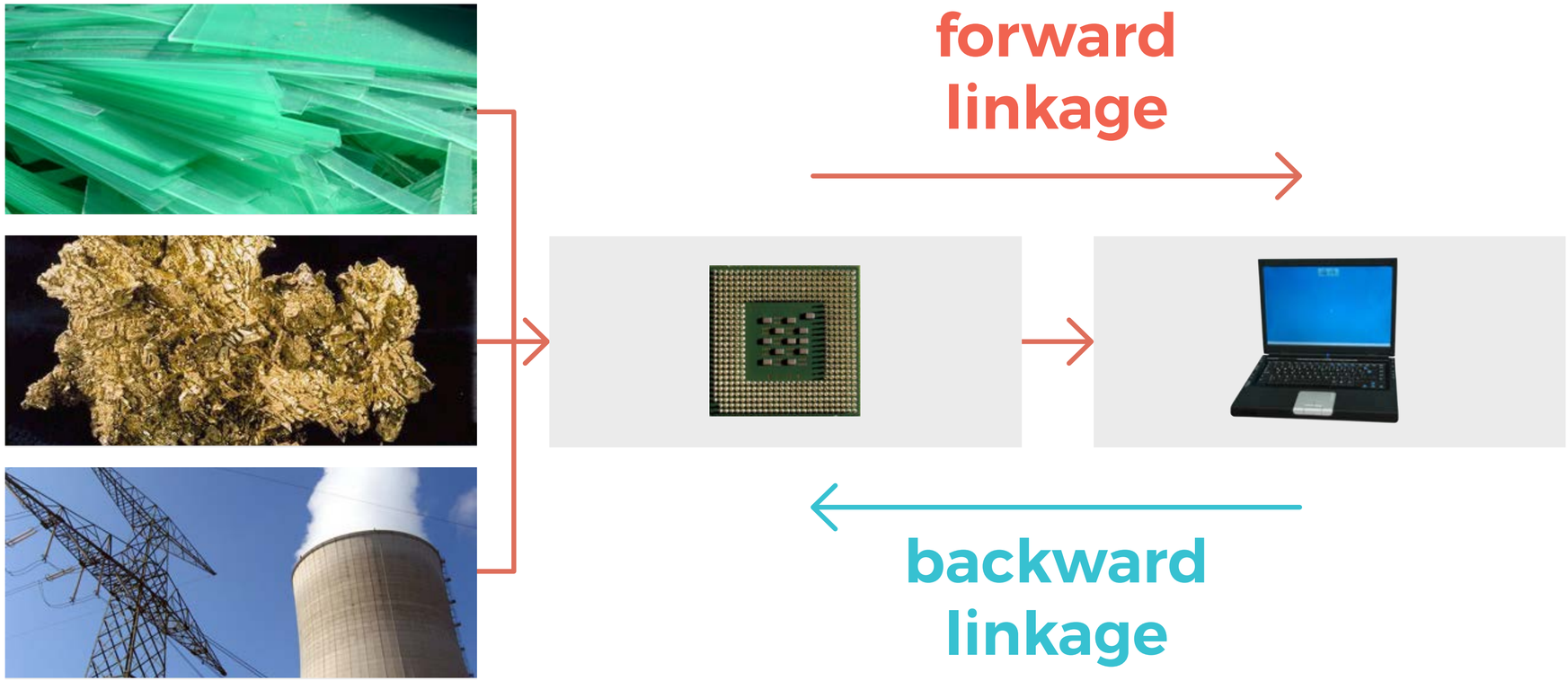






backward linkage

LINKAGES



SOME KEY TERMS

Induced Effects: Stem from employees spending their wages

In addition to purchasing inputs, the directly affected firm must hire additional labor

- *When those workers spend their income, it generates the first round of induced effects*
- *These expenditures increase demand for businesses, generating additional rounds of induced effects*

LET'S TALK ABOUT INDUSTRIES, SECTORS, AND COMMODITIES

SO WHAT IS A NAICS CODE?

An **Industry** is made up of firms with similar Input Patterns

FIRMS CLASSIFIED AS
NAICS 334413
Semiconductor and related device manufacturing

SO WHAT IS A NAICS CODE?

Commodities Produced By Sector 309 (NAICS 334413):

- Diodes, solid-state (e.g., germanium, silicon), manufacturing
- Fuel cells, solid-state, manufacturing
- Gunn effect devices manufacturing
- Hall effect devices manufacturing
- Hybrid integrated circuits manufacturing
- Infrared sensors, solid-state, manufacturing
- Integrated microcircuits manufacturing
- Laser diodes manufacturing
- LED (light emitting diode) manufacturing
- Light emitting diodes (LED) manufacturing
- Metal oxide silicon (MOS) devices manufacturing
- Microcontroller chip manufacturing
- Microprocessor chip manufacturing
- Monolithic integrated circuits (solid-state) manufacturing
- MOS (metal oxide silicon) devices manufacturing
- Optoelectronic devices manufacturing
- Photoelectric cells, solid-state (e.g., electronic eye), manufacturing
- Photonic integrated circuits manufacturing
- Photovoltaic cells manufacturing
- Photovoltaic devices, solid-state, manufacturing
- Rectifiers, semiconductor, manufacturing
- Semiconductor circuit networks (i.e., solid-state integrated circuits) manufacturing
- Semiconductor devices manufacturing
- Semiconductor dice and wafers manufacturing
- Semiconductor memory chips manufacturing
- Silicon wafers, chemically doped, manufacturing
- Silicon wave guides manufacturing
- Solar cells manufacturing
- Static converters, integrated circuits, manufacturing
- Thin film integrated circuits manufacturing
- Thyristors manufacturing
- Transistors manufacturing
- Voltage regulators, integrated circuits, manufacturing
- Wafers (semiconductor devices) manufacturing

SO WHAT IS A NAICS CODE?

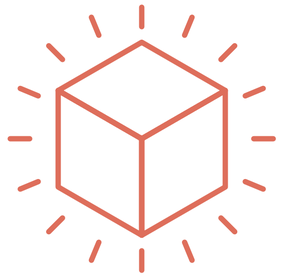
INDUSTRIES VS. COMMODITIES

What is an **industry**?

An industry can make more than one commodity

- **EXAMPLE:** Semi conductors sectors 309—What do they make?
  - *Semiconductors and related devices*
  - *Printed circuit assembles (electronic assembles)*

INDUSTRIES VS. COMMODITIES

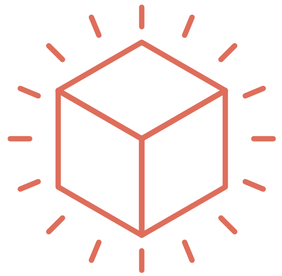


What is a **commodity**?

A commodity can be produced by more than one Industry

- **EXAMPLE:** Commodity 3309—semi conductors and related devices
- Who makes Semi Conductors and related devices?

INDUSTRIES VS. COMMODITIES



What is a **commodity**?

While it will differ by region, these Industries all produce Semi Conductors and related devices

- *309 Semi Conductor and related device manufacturing*
- *313 Other electronic component manufacturing*
- *342 All other miscellaneous electrical equipment and component manufacturing*

INDUSTRIES/SECTORS/COMMODITIES

How do we distinguish between a producing Industry and the product it produces? To get the code for the primary commodity, add 3000 to Industry/Sector code

SECTOR 359: Other aircraft parts and auxiliary equipment manufacturing its primary commodity	→	?
SECTOR 389: Gasket, packing, and sealing device manufacturing	→	?
SECTOR 275: Air Purification and ventilation equipment manufacturing	→	?

INDUSTRIES/SECTORS/COMMODITIES

How do we distinguish between a producing Industry and the product it produces? To get the code for the primary commodity, add 3000 to Industry/Sector code

SECTOR 359: Other aircraft parts and auxiliary equipment manufacturing its primary commodity	→	**COMMODITY 3359:** Other aircraft parts and auxiliary equipment
SECTOR 389: Gasket, packing, and sealing device manufacturing	→	**?**
SECTOR 275: Air Purification and ventilation equipment manufacturing	→	**?**

INDUSTRIES/SECTORS/COMMODITIES

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SECTOR 359: Other aircraft parts and auxiliary equipment manufacturing its primary commodity	→	**COMMODITY 3359:** Other aircraft parts and auxiliary equipment
SECTOR 389: Gasket, packing, and sealing device manufacturing	→	**COMMODITY 3389:** Gaskets, packings, and sealing devices
SECTOR 275: Air Purification and ventilation equipment manufacturing	→	**?**

INDUSTRIES/SECTORS/COMMODITIES

How do we distinguish between a producing Industry and the product it produces? To get the code for the primary commodity, add 3000 to Industry/Sector code

SECTOR 359: Other aircraft parts and auxiliary equipment manufacturing its primary commodity	→	**COMMODITY 3359:** Other aircraft parts and auxiliary equipment
SECTOR 389: Gasket, packing, and sealing device manufacturing	→	**COMMODITY 3389:** Gaskets, packings, and sealing devices
SECTOR 275: Air Purification and ventilation equipment manufacturing	→	**COMMODITY 3275:** Air purification and ventilation equipment

LET'S TAKE A LOOK AT BACKGROUND DATA

EXPLORING BACKGROUND DATA

Brevard County Top Industries

Employment

- 440 Real Estate
- 501 Full-Service Restaurants
- 534 *Employment and Payroll of local govt, education
- 533 *Employment and Payroll of local govt, non-education
- 502 Limited-service restaurants

Income

- 360 Guided Missile and Space Vehicle Manufacturing
- 475 Offices of Physicians
- 309 Semiconductor and Related Device Manufacturing
- 535 *Employment and payroll of federal govt, non-military
- 533 *Employment and Payroll of local govt, non- education

Value Added

- 441 Owner-Occupied Dwellings
- 309 Semiconductor and Related Device Manufacturing
- 395 Wholesale Trade
- 440 Real Estate
- 535 *Employment and Payroll of federal govt, non-military

Output

- 309 Semiconductor and Related Device Manufacturing
- 441 Owner-Occupied Dwellings
- 360 Guided Missile and Space Vehicle Manufacturing
- 395 Wholesale Trade
- 440 Real Estate

EXPLORING BACKGROUND DATA

Commodity Demands

Study Area Data

Gross Commodity Demand by Institution

- Sum of Households
  - 3004 Fruit: $24,353,675
- Sum of Federal Government
  - 3309 Semiconductors and Related Devices: $4,836,161

Social Accounts

Commodity Demand by Institution Met Locally

- Sum of Households
  - 3004 Fruit: $2,522
- Sum of Federal Government
  - 3309 Semiconductors and Related Devices: $1,774,243

EXPLORING BACKGROUND DATA

Balance Sheets

Industry Balance Sheet

- Commodity Production
  - *Byproduct Sums to 100%*
- Commodity Demand
  - *Commodities Demanded by the Industry*
- Value Added
  - *Value Added Factors*

Commodity Balance Sheet

- Industry-Institutional Production
  - *Market Share Sums to 100%*
- Industry Production
  - *Industries that Demand the Commodity*
- Institutional Demand
  - *Demand of the Commodity by Institution*

EXPLORING BACKGROUND DATA

Balance Sheets

Industry Balance Sheet: Commodity Demand

Gross Absorption: The percentage of Output that goes to the purchase of a given commodity.

RPC: % of local demand for a commodity that is met by local producers

Regional Absorption: The percentage of Output that goes to the local purchase of a given commodity (Gross Absorption × RPC).

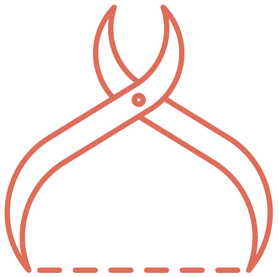
EXPLORING BACKGROUND DATA

EXAMPLE: 360 Guided missile and space vehicle manufacturing (Social Accounts: Aerospace)

Code	Description	Gross Absorption	Gross Inputs ($)	RPC	Regional Absorption	Regional Inputs ($)
3049	Electricity transmission and distribution	0.154 %	2,873,089	23.800 %	0.037 %	683,783
3050	Natural gas distribution	0.023 %	429,711	10.671 %	0.002 %	45,855
3051	Water, sewage and other systems	0.025 %	461,466	18.742 %	0.005 %	86,488
3062	Maintained and repaired nonresidential structures	0.108 %	2,010,019	93.274 %	0.100 %	1,874,822
3148	Paperboard from pulp	0.011 %	200,166	0.000 %	0.000 %	0
3149	Paperboard containers	0.022 %	410,787	2.351 %	0.001 %	9,658
3156	Refined petroleum products	0.005 %	89,923	1.479 %	0.000 %	1,330
3165	Other basic organic chemicals	0.262 %	4,895,426	0.010 %	0.000 %	494
3185	Compounded resins	0.026 %	492,795	0.982 %	0.000 %	4,837

BUT HOW DO I KNOW THAT WHAT I'M MODELING WILL WORK?

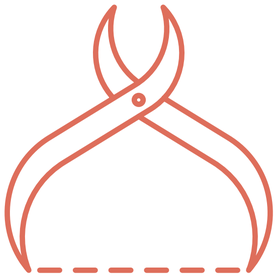
FEASIBILITY ANALYSIS



Feasibility is an analysis of the viability of an idea or venture. The venture could be a start-up business, the purchase of an existing business, an expansion of current business operations.

- *Involves looking at cost and benefits. It essentially determines the strengths and weaknesses of a business proposal.*

FEASIBILITY ANALYSIS



Anyone who faces great uncertainty and risks when making decisions about major investments in new facilities, new products, new markets, new technologies, or acquiring other companies needs to consider whether the project is feasible.

FEASIBILITY ANALYSIS

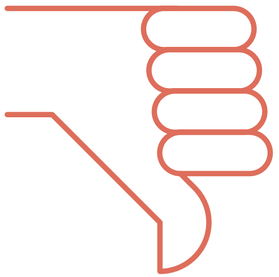
When is Feasibility Important?

Feasibility Analysis is used to determine the best or preferred investment because:

- *Involve massive investment of resources*
- *Are not easily reversible*
- *Involve uncertainty and risk for the firm*
- *There are usually many options to invest in, and by using financial concepts, a firm can find the best potential investment.*

FEASIBILITY ANALYSIS

When is Feasibility Important?



Failure to evaluate or poor evaluations of long-term investment decisions can affect the business for years to come, and are critical to its strategic success and survival.

FEASIBILITY ANALYSIS

Example Projects

- Should we give tax incentives to lure prospect?

FEASIBILITY ANALYSIS

Example Projects

- Should we give tax incentives to lure prospect?
- Should we build a new football stadium?

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- Should we add a new product to our existing product line?
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- Where to locate a manufacturing facility?

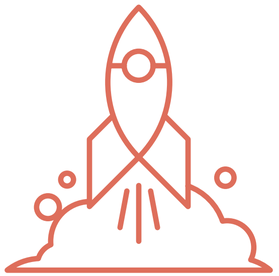
FEASIBILITY ANALYSIS

Example Projects

- Should we give tax incentives to lure prospect?
- Should we build a new football stadium?
- Should we add a new product to our existing product line?
- Should we expand into a new market?
- Where to locate a manufacturing facility?
- **In combination of running the impact to determine what the effects will be, we need to be sure the project is Feasible outside of IMPLAN**

ACTIVITY: SPACE 1000

ACTIVITY: SPACE 1000



An aerospace manufacturing facility in Florida will be increasing their missile production within the region.

Due to the increase in production, they will be increasing the number of employees and compensation.

ACTIVITY: SPACE 1000

Where is the impact taking place?

What are the known Economic Values?

Which Industry is seeing the impact?

What year do your economic values represent?

ACTIVITY: SPACE 1000

Where is the impact taking place?	**Brevard County, Florida**
What are the known Economic Values?	
Which Industry is seeing the impact?	
What year do your economic values represent?	

ACTIVITY: SPACE 1000

Where is the impact taking place?	**Brevard County, Florida**
What are the known Economic Values?	**Employee Compensation: $30MM (Initial Input)** **Employment: 176**
Which Industry is seeing the impact?	
What year do your economic values represent?	

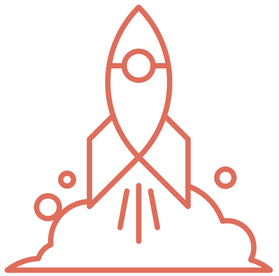
ACTIVITY: SPACE 1000

Where is the impact taking place?	**Brevard County, Florida**
What are the known Economic Values?	**Employee Compensation: $30MM (Initial Input)** **Employment: 176**
Which Industry is seeing the impact?	**360 Guided Missile and Space Vehicle Manufacturing**
What year do your economic values represent?	

ACTIVITY: SPACE 1000

Where is the impact taking place?	**Brevard County, Florida**
What are the known Economic Values?	**Employee Compensation: $30MM (Initial Input)** **Employment: 176**
Which Industry is seeing the impact?	**360 Guided Missile and Space Vehicle Manufacturing**
What year do your economic values represent?	**2017**

ACTIVITY: SPACE 1000



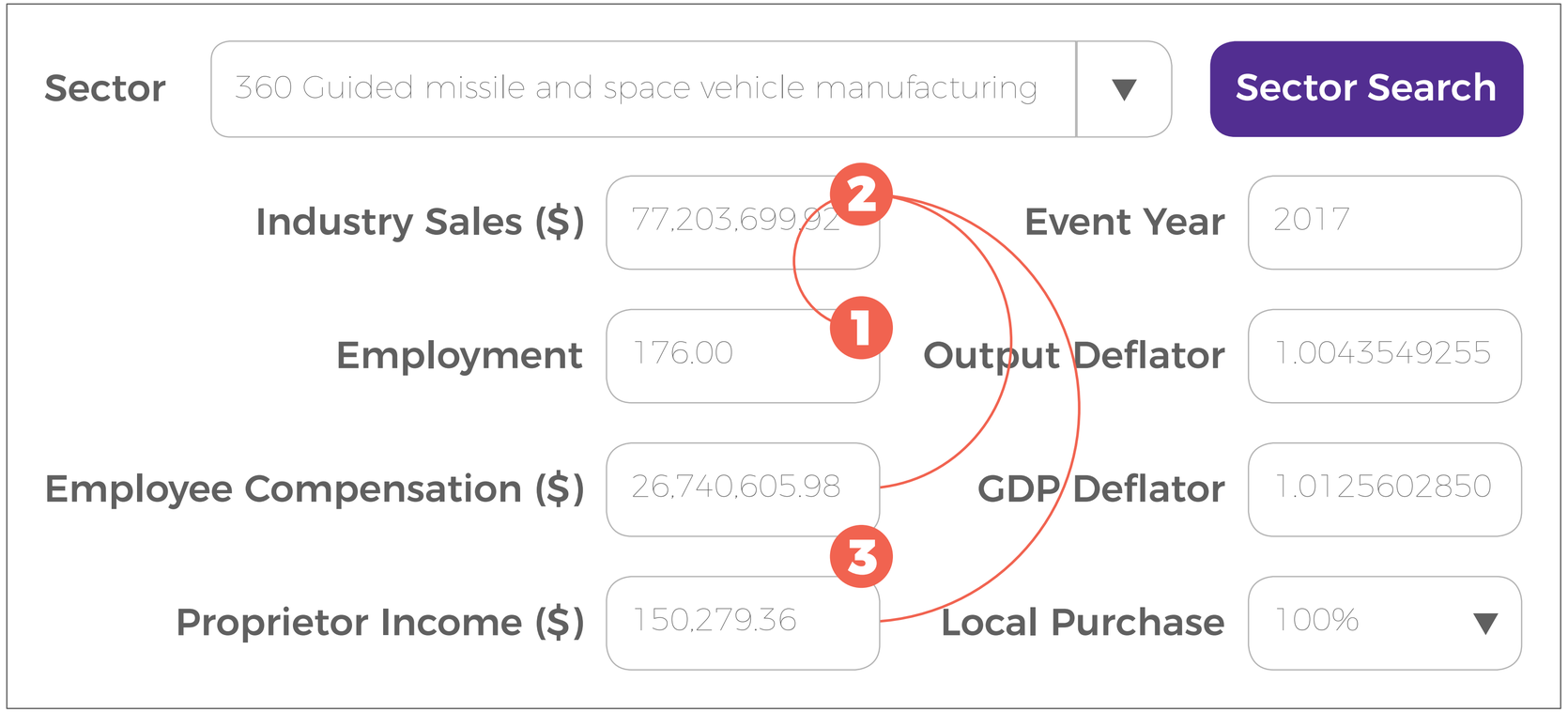
The study is better when we have at least two variables:

- Employee Compensation
- Employment

So what do we enter first?

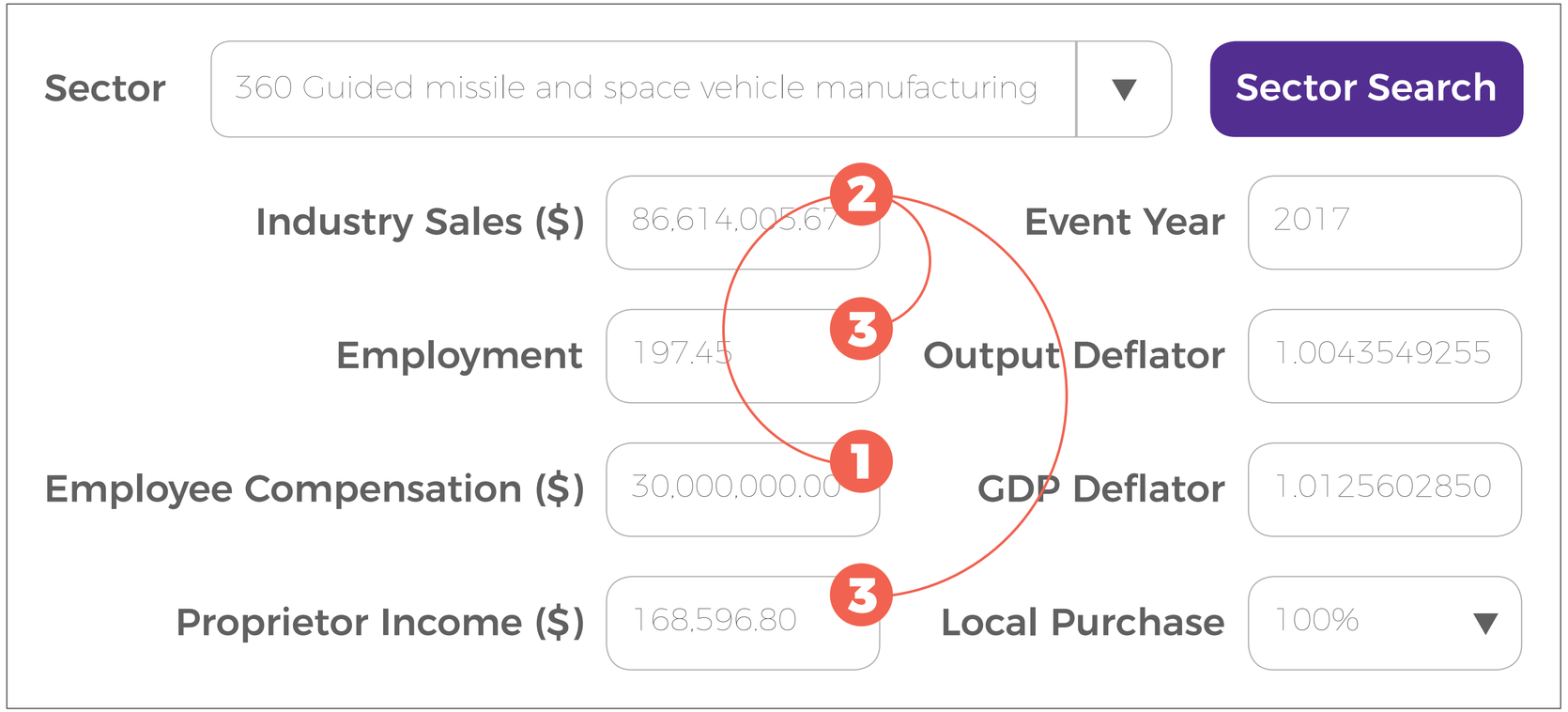
ACTIVITY: SPACE 1000

If **employment** is our initial input (this uses the underlying *output per worker*):



ACTIVITY: SPACE 1000

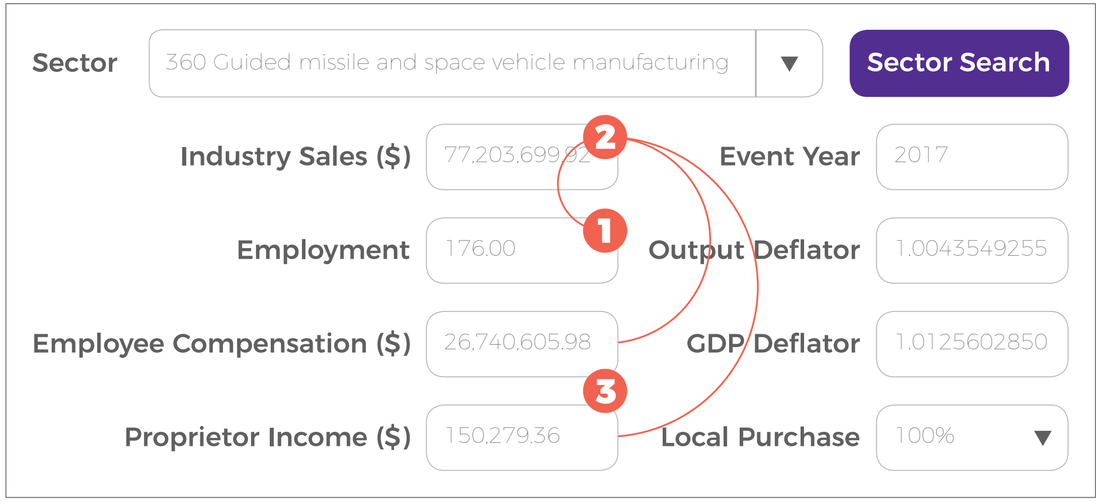
However, if you start with **employee compensation** as your initial input (this uses *output/compensation* to estimate output):



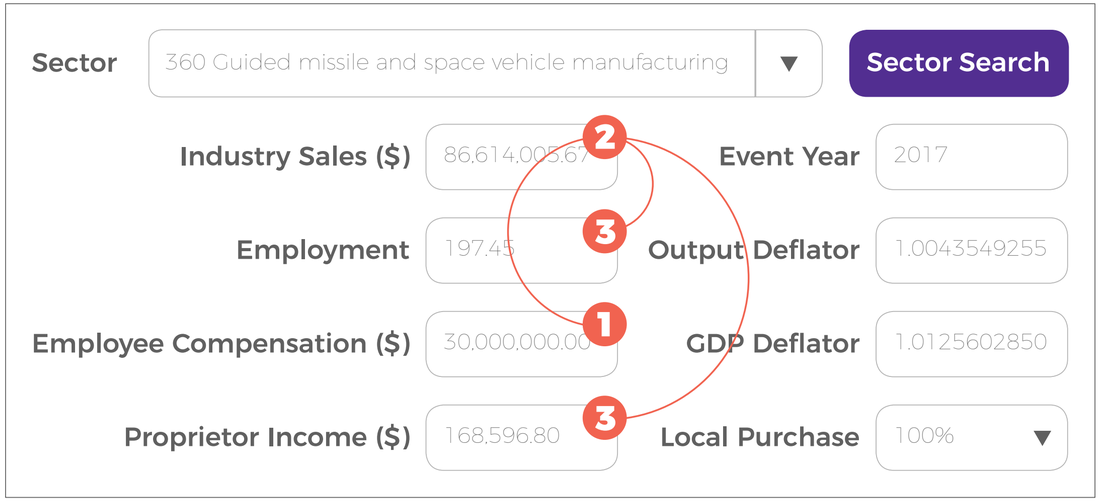
ACTIVITY: SPACE 1000

Based on what we've learned so far which is the stronger relationship to estimate from?

A. Start with employment.



B. Start with employee compensation.



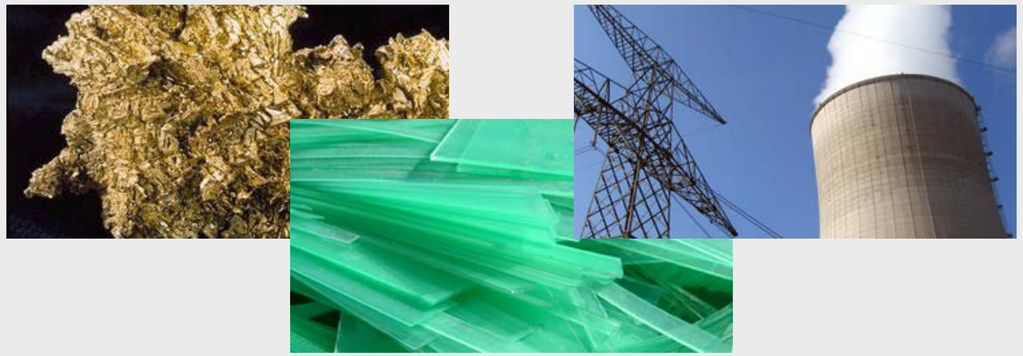
ANALYSIS-BY-PARTS

ANALYSIS-BY-PARTS (ABP)

ABP splits an impact into 2 parts

Part 1: Intermediate Expenditures

Industry Spending Pattern Activity



Part 2: Labor Income

Labor Income Change Activity

ANALYSIS-BY-PARTS (ABP)

What information do I need for an ABP?

Part 1: Intermediate Expenditures	Part 2: Labor Income
Budget Value **or** Total Output (Industry Sales)	Employee Compensation · *Includes wage & salary, benefits, and taxes paid by both employer and employee* Proprietor Income (if any) · *Includes benefits and payroll taxes*

ANALYSIS-BY-PARTS (ABP)

Budget vs. Output (Industry Sales)

What is the difference between **budget value** and **total output**?

budget = list of inputs needed for the industry's operation

output = value of production

ANALYSIS-BY-PARTS (ABP)

Budget vs. Output (Industry Sales)

What is the difference between **budget value** and **total output**?

budget = list of inputs needed for the industry's operation

output = value of production

intermediate expenditures
employee compensation,
proprietor income
other property income
taxes on production and imports

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ANALYSIS-BY-PARTS (ABP)

Review and Recap

Part 1. Industry Spending Pattern

This is the portion of **output** that is spent on **intermediate expenditures.** When the amount entered in the **activity level** is:

- **Total Budget:** Normalize and set the **activity level** to your budget—(the **total value** is spent ONLY on **intermediate expenditures**).
- **Output:** Do not normalize—enter your full **output value** in the **industry sales field**.

Part 2. Labor Income Change

Portion of **output** that is only spent on **labor income** (**employee compensation** and **proprietor income**).

ANALYSIS-BY-PARTS (ABP)

When would I use ABP?

- When you have a list of inputs that a company purchases for its operations

ANALYSIS-BY-PARTS (ABP)

When would I use ABP?

- When you have a list of inputs that a company purchases for its operations
- When working with non-profit or government institution

ANALYSIS-BY-PARTS (ABP)

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- When an industry does not exist in your region

ANALYSIS-BY-PARTS (ABP)

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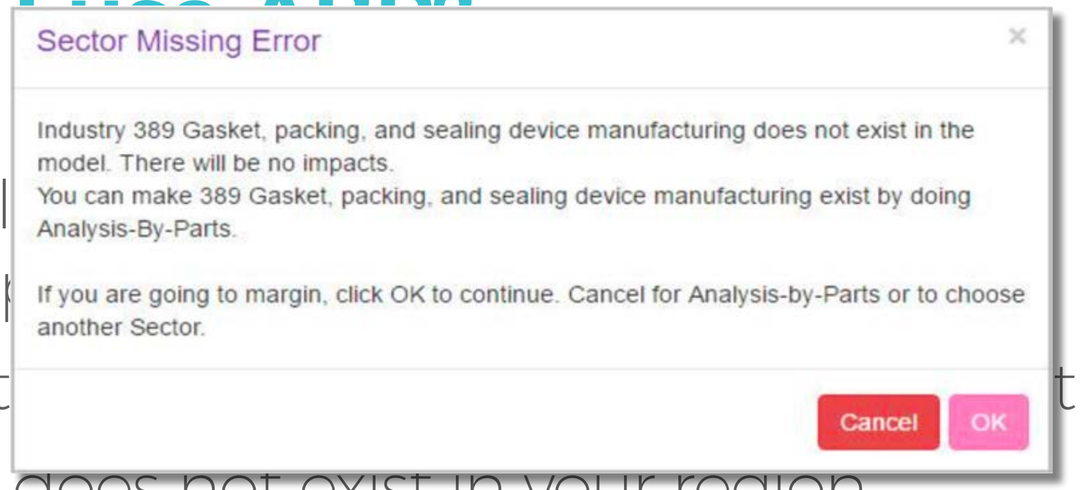


ANALYSIS-BY-PARTS (ABP)

For an industry that doesn't exist in the study region

We now have an Excel template for this exact situation! You only need one input value:

- Output
- Employee Compensation
- Employment

ACTIVITY: THE CASE OF THE MISSING MANUFACTURERS

ACTIVITY: MISSING MANUFACTURERS

- Two different companies are considering relocating to Brevard County, Florida
- The IMPLAN sectors to which these companies belong do not exist in the county
- What is the economic impact each company will have on the county?

ACTIVITY: MISSING MANUFACTURERS

Analysis 1:

Who	**Sector 389: Gasket, Packing and Sealing Device Manufacturing**
What	**$5MM Employee Compensation (2018 Dollars)**
Where	**Brevard County, FL**
When	**2018**

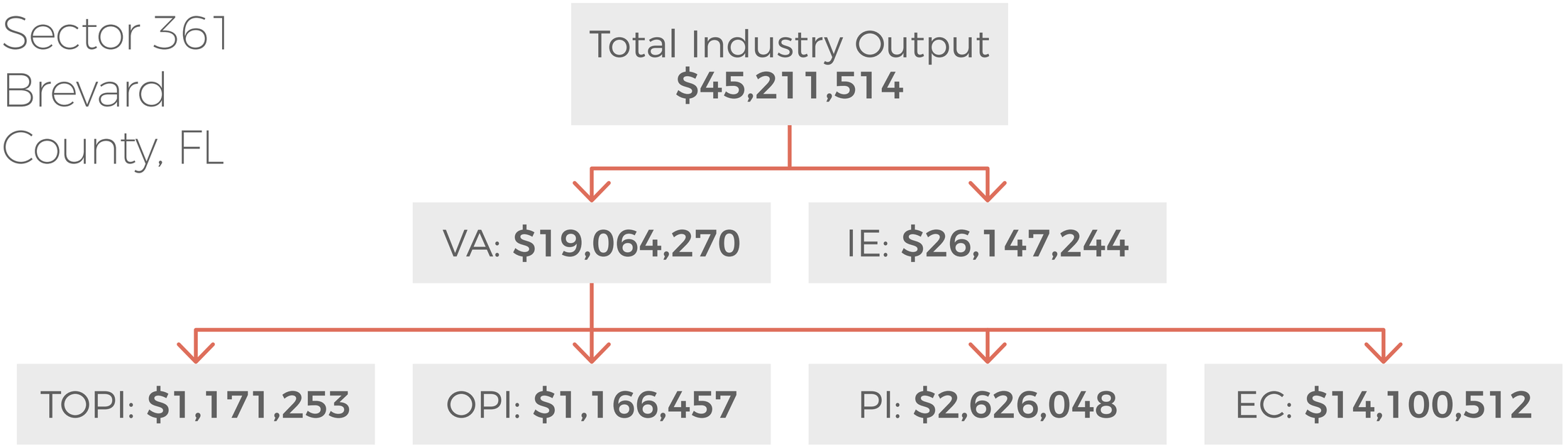
Analysis 2:

Who	**Sector 275: Air Purification and Ventilation Equipment Manufacturing**
What	**103 FTE Employment (2018 Employment)**
Where	**Brevard County, FL**
When	**2018**

ACTIVITY: MISSING MANUFACTURERS

Output Equation Example (Values):

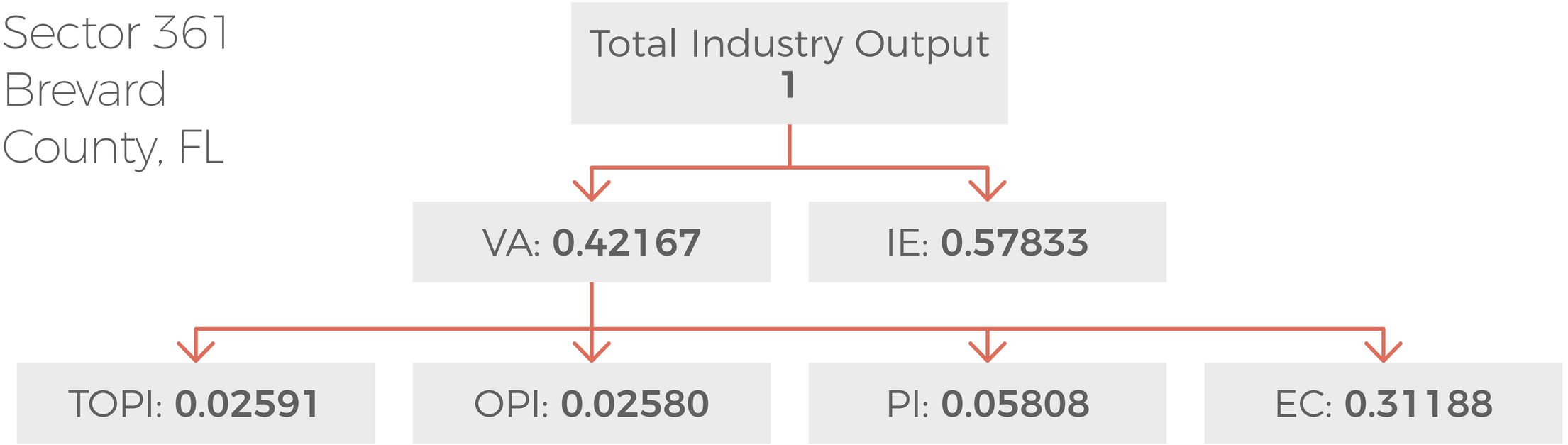
Sector 361
Brevard
County, FL



ACTIVITY: MISSING MANUFACTURERS

Output Equation Example (Coefficients):

Sector 361
Brevard
County, FL



ACTIVITY: MISSING MANUFACTURERS

Summary Results: Analysis 1 (Sector 389)

Impact Type	Employment	Emp. Compensation	Total Value Added	Output
Direct	112.1	$5,806,238	$7,050,098	$22,975,862
Indirect	41	$1,911,563	$2,796,249	$5,637,240
Induced	43	$1,608,588	$2,857,565	$5,101,045
Total	**196.0**	**$9,326,389**	**$12,703,912**	**$33,714,147**
Multiplier	1.74890699	1.606270549	1.801948269	1.467372467

ACTIVITY: MISSING MANUFACTURERS

Summary Results: Analysis 2 (Sector 275)

Impact Type	Employment	Emp. Compensation	Total Value Added	Output
Direct Effect	104.7	$6,226,806	$8,729,449	$27,044,414
Indirect Effect	24	$1,345,588	$2,179,826	$4,086,014
Induced Effect	42	$1,574,105	$2,795,192	$4,991,033
Total Effect	**171.2**	**$9,146,499**	**$13,704,466**	**$36,121,461**
Multiplier	1.635284601	1.468891004	1.569911918	1.335634852

IMPLAN Workshop: Florida Power and Light

Visit IMPLAN.com/Welcome for more resources.

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