ECON 4730/5730

Economic Impact Analysis

College of Business
Department of Economics

Economic Impact Analysis

- Economic Impact (Contribution) Analysis uses Input-Output Methodology
- Contribution Analysis is like Economic Impact Analysis but for an existing industry
- Input-Output Methodology is based on an Input-Output Table
- Economic Impact Analysis software and tools include:
  - IMPLAN
  - REMI
  - Moody's Analytics
  - Lightcast
  - RIMS tables from the U.S. Bureau of Economic Analysis

Economic Impact Analysis

History of Input-Output

- 1930's Wassily Leontief first to use input-output matrix of national economy
- Consulted with U.S. Bureau of Labor Statistics to publish the first official U.S. I-O table in 1944
- It was a 95-sector Industry by Industry "transaction" table of the 1939 economy

Input-Output Modeling System

A complete picture of the monetary flows that occurred in an economy in a given year

- **Industries:** value of production, input purchases, profits, inventory, taxes, labor income, employment, subsidies
- **Households:** spending patterns, income, taxes, social assistance, savings
- **Governments:** consumption spending, investment spending, revenue
- **Geographies:** trade, commuting

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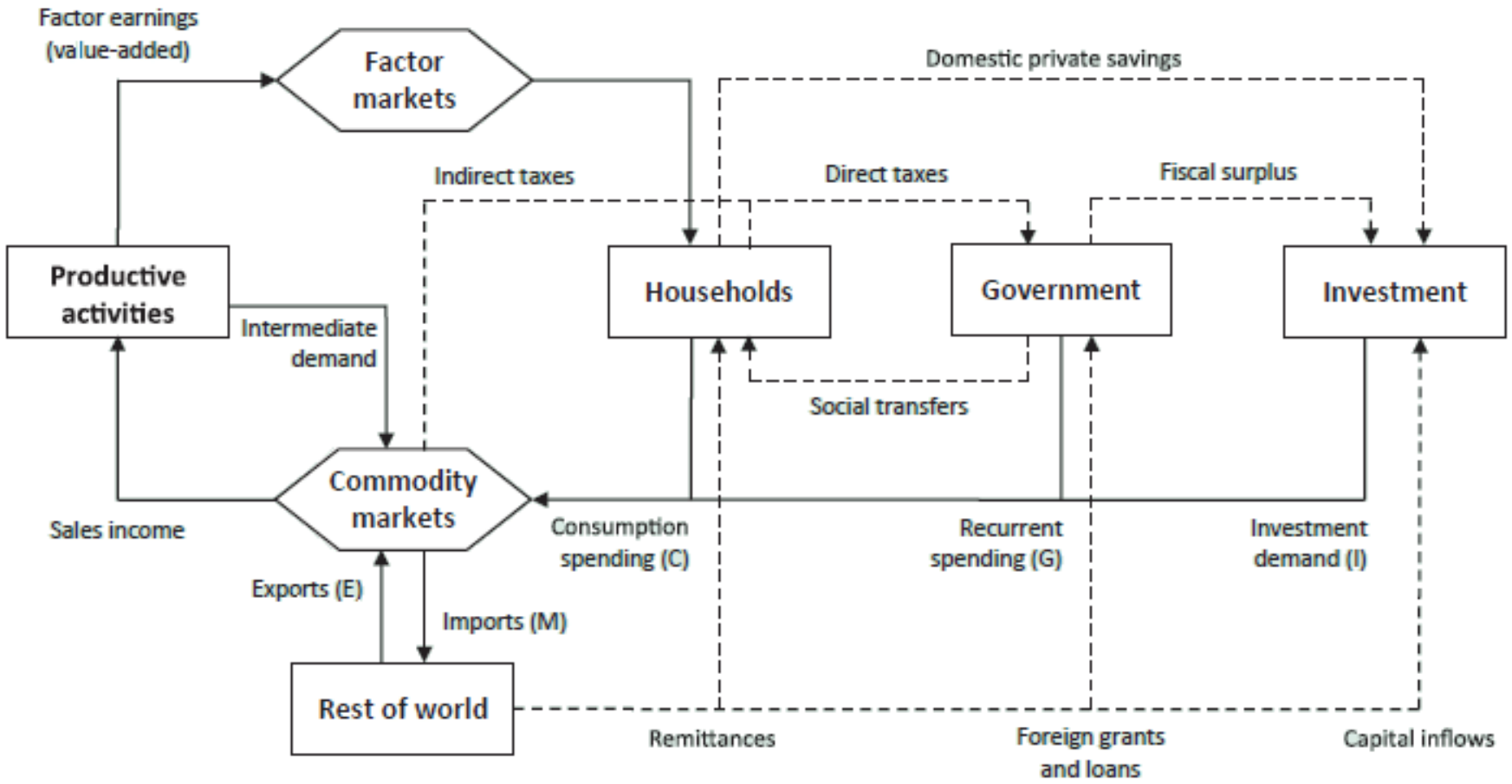
Circular Flow Chart



Social Accounting Matrix

	inter-industry input-Ouput															Final Demand					
Industry	Agriculture	Mining	Manufacturing	Utilities	Construction	Wholesale and retail trade	Transportation and storage	Accomodation and food services	Telecommunications	IT and other information services	Financial activities	Public administration	Education	other service	**Total immediate use**	Consumption	Government	Investment	Exports	**Total Final Use**	**Total Output**
Agriculture	38	48	58	68	78	88	98	108	118	128	138	148	158	168	**1,442**	1,070	2,674	1,070	535	**5,348**	**6,790**
Mining	200	210	220	230	240	250	260	270	280	290	300	310	320	330	**3,710**	656	1,640	656	328	**3,280**	**6,990**
Manufacturing	150	160	170	180	190	200	210	220	230	240	250	260	270	280	**3,010**	836	2,090	836	418	**4,180**	**7,190**
Utilities	250	260	270	280	290	300	310	320	330	340	350	360	370	380	**4,410**	596	1,490	596	298	**2,980**	**7,390**
Construction	20	30	40	50	60	70	80	90	100	110	120	130	140	150	**1,190**	1,280	3,200	1,280	640	**6,400**	**7,590**
Wholesale and retail trade	50	60	70	80	90	100	110	120	130	140	150	160	170	180	**1,610**	1,236	3,090	1,236	618	**6,180**	**7,790**
Transportation and storage	80	90	100	110	120	130	140	150	160	170	180	190	200	210	**2,030**	1,192	2,980	1,192	596	**5,960**	**7,990**
Accomodation and food services	60	70	80	90	100	110	120	130	140	150	160	170	180	190	**1,750**	1,288	3,220	1,288	644	**6,440**	**8,190**
Telecommunications	85	95	105	115	125	135	145	155	165	175	185	195	205	215	**2,100**	1,258	3,145	1,258	629	**6,290**	**8,390**
IT and other information services	520	530	540	550	560	570	580	590	600	610	620	630	640	650	**8,190**	80	200	80	40	**400**	**8,590**
Financial activities	600	610	620	630	640	650	660	670	680	690	700	710	720	730	**9,310**	536	1,340	536	268	**2,680**	**11,990**
Public administration	500	510	520	530	540	550	560	570	580	590	600	610	620	630	**7,910**	856	2,140	856	428	**4,280**	**12,190**
Education	120	130	140	150	160	170	180	190	200	210	220	230	240	250	**2,590**	1,960	4,900	1,960	980	**9,800**	**12,390**
other service	340	350	360	370	380	390	400	410	420	430	440	450	460	470	**5,670**	1,384	3,460	1,384	692	**6,920**	**12,590**
Total immediate use	**3,013**	**3,153**	**3,293**	**3,433**	**3,573**	**3,713**	**3,853**	**3,993**	**4,133**	**4,273**	**4,413**	**4,553**	**4,693**	**4,833**	**54,922**	**14,228**	**35,569**	**14,228**	**7,114**	**71,138**	**126,060**
Taxes	477	497	517	537	557	577	597	617	637	657	677	697	717	737	**8,498**						
Compensation of employees	1,500	1,530	1,560	1,590	1,620	1,650	1,680	1,710	1,740	1,770	5,000	5,030	5,060	5,090	**36,530**						
Gross opearting surplus	1,800	1,810	1,820	1,830	1,840	1,850	1,860	1,870	1,880	1,890	1,900	1,910	1,920	1,930	**26,110**						
Gross value added	3,777	3,837	3,897	3,957	4,017	4,077	4,137	4,197	4,257	4,317	7,577	7,637	7,697	7,757	**71,138**						
Total output	**6,790**	**6,990**	**7,190**	**7,390**	**7,590**	**7,790**	**7,990**	**8,190**	**8,390**	**8,590**	**11,990**	**12,190**	**12,390**	**12,590**	**126,060**						

Input-Output Assumptions

1. Constant returns to scale
2. Fixed input structure; no substitution effects
3. Industry homogeneity
4. No supply constraints
5. Technology assumption
6. Constant byproduct coefficients
7. The model is static
8. Backward linkages

Economic Impact Analysis Steps

- Starts with an economic event (e.g., new business or government program)
- Use NAICS codes to identify the industry
- Identify and define the region
- Economic "event" is measured by jobs, CAPEX, OPEX, sales, etc.
- Use IO table or SAM to track the effects of the "event" via the circular flow chart
- Contribution analysis does the same, but for an existing industry

Measuring the Economic Impact

- **Output** represents the value of an Industry's production.
  - For manufacturers: Output = sales +/- change in inventory
  - For service sectors: Output = sales

- **Intermediate Inputs** are purchases of non-durable goods and services that are used to produce other goods and services.
  - They do not include any capital-account purchases or labor.

- **Value Added** is the "added value" to the Intermediate Inputs in order to produce the final product.
  - It is the contribution to GDP.
  - Value Added + Intermediate Inputs = Output

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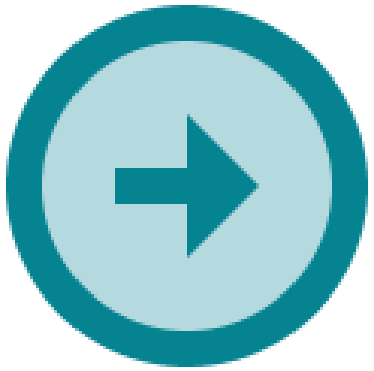
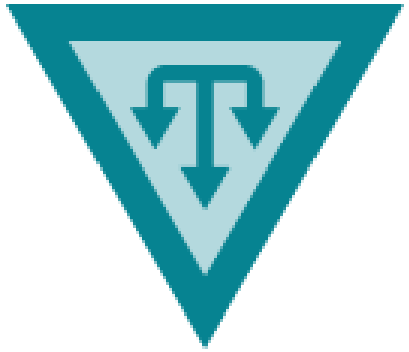
Types of Effects



1
Direct Effects

2
Indirect Effects



3
Induced Effects

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Direct Effects

Direct Effects are the initial effects to a local Industry or Industries due to the activity or policy being analyzed.

Indirect Effects

Indirect Effects are the effects stemming from business-to-business purchases in the supply chain taking place in the region.

Induced Effects

Induced Effects are the effects stemming from labor income being spent throughout the region associated with the directly impacted Industry and those indirectly impacted through the supply chain.

Multipliers

Multipliers estimate the “ripple effect”, or ratio of total effect to direct effect within a region.

Similar to the Keynesian-cross multiplier: 1/(1-MPC)

$$\frac{\text{Direct + Indirect + Induced}}{\text{Direct}}$$

An industry with a multiplier of 2 generates an additional of $1 of Indirect and Induced per $1 of Direct Effect.

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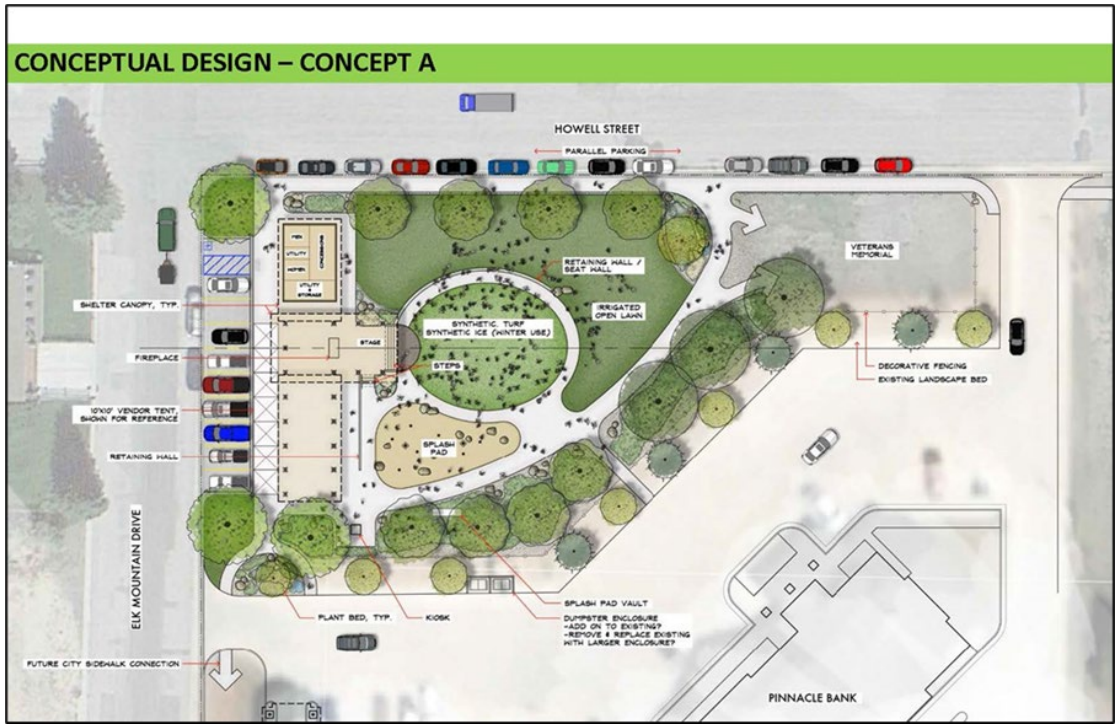
Cost-Benefit Analysis

- **Net Impacts** report a holistic look at the effects resulting from a change in production or spending in the economy by considering both the positive and negative effects.
- **Opportunity Cost** is the benefit that is lost when one choice is made over another; they are the missed opportunities that are often overlooked in analysis. Must be done by the analyst in IMPLAN.

Example #1. Economic Impact Analysis

- Heritage Park was proposed for Newcastle, WY
- Economic impact study required for WBC grant application
- Four phases of economic impacts:
  - Construction
  - Visitor spending
  - Residential
  - Maintenance/operations



Example #2. Contribution Analysis

- Measure the economic contribution of Wyoming hospitals and nursing homes.
- 35 nursing homes
- 33 hospitals
- Over $1 billion in employee compensation.