Integrating Crop and Livestock Cost and Return Estimates Into an Input-Output Model of Owyhee County, Idaho.

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Introduction

Through input-output modeling, exogenous shocks to the Owyhee County, Idaho economy and estimated impacts to its industry output, income and employment are derived. There are many widely used and published secondary IO models on the market today including IMPLAN and RIMS II. Too often with these models, national average make-share tables are used that do not represent the local agricultural industries, and agricultural sectors are overly aggregated. Using crop and livestock cost and return estimates, the IO model can be expanded and localized to investigate impacts to specific agricultural industry. Using enterprise budgets, each production cost is allocated to the IO industry where purchased. If more than one budget exists for a region, weight and average the costs and returns by the acreage or unit of output of each commodity for a regional account. By using margining techniques and regional purchase coefficients, the IO accounts are converted to producer prices and purged of all imports. The commodity accounts can now be expanded by multiplying value of production estimates by the technical coefficients derived from the cost and return estimates. Following these procedures yields an industry by commodity matrix which includes regional production practices and not national. This model is applied to Owyhee County to evaluate the range cattle industry.

IO Models

Input-output (IO) modeling is a quantitative tool used for effectively estimating impacts of exogenous "shocks" to an economy in terms of industry output, income, and employment. Using an IO model, impact assessments can be used to show effects of governmental policies, new business introduction, or business closure on a regional or local economy. The IO model is

simply a map of transactions or purchases and sales made between different entities in a local economy.

The use of input-output models for impact analysis has expanded given the development of numerous microcomputer input-output programs. Microcomputer programs such as IMPLAN (Minnesota IMPLAN Group Inc. 1997), ADOTMATR (Lamphear et al. 1983), RIMS II (U.S. Department of Commerce 1997), and the Schaffer Model (Schaffer and Davidson 1985) employ secondary procedures to formulate local input-output models. The secondary procedures have been adopted because of time and money constraints that preclude development of a primary, survey-based input-output model. Schaffer and Chu (1969) and Round (1983) analyzed potential errors in regional or county level input-output models from secondary procedures instead of primary surveys. Their results imply that secondary models yield substantial errors when compared to primary survey-based models.

Given that survey-based models are too time consuming and expensive and that conversion of a national model through secondary procedures is too unreliable, the hybrid-type county level input-output model has provided the best solution. There are several hybrid-type approaches. Among the most promising is the "mongrel model" or the mixed survey/non-survey model suggested by Jensen (1980). Jensen suggested a two-step approach for development of a "mongrel model." First, a non-survey input-output model is developed from a microcomputer program such as IMPLAN. The second step involves the insertion of superior data obtained from surveys, other primary sources, or reliable sources. There is a substitution of superior data into the model, and appropriate techniques are employed to balance the regional models.

The emergence of controversial public land management decisions, surface and groundwater regulation, agricultural production regulations, and environmental concerns have

created a need for a method to localize IO models. This localization of the IO model will more accurately define agricultural sectors pertinent to a region. Instead of including all of agriculture in one economic sector or a few broad sectors, numerous agricultural sectors can be used.

Many crop and livestock products grown in the United States are grown strictly in certain regions and are aggregated with other industries in the secondary impact models. These agricultural production sectors, however small in importance nationally, may have large impacts in their respective production area. The Owyhee County, Idaho economy relies heavily on agricultural production as an economic base with range livestock being its largest component. In the secondary IO models there are two cattle production sectors, Ranch Fed Cattle and Range Fed Cattle. However, when deriving impacts, direct impacts occur on the sector(s) being studied. The range and ranch fed cattle sectors from IMPLAN are based on a National use matrix that does not correctly depict the way range cattle are produced in Owyhee County. By using budgets from Owyhee County for the data, the range livestock sector, as well as the other agricultural production sectors, can be localized to provide an accurate picture of these industries.

This paper has two components. First, we explain how crop and livestock cost and return estimates were transformed into a framework suitable for use in a "mongrel" type IO model using IMPLAN as a base. Second, we discuss the resulting IO model of Owyhee County. By studying agricultural enterprises as individual economic sectors, with expenditure patterns different from national averages and in a less aggregated format, we more accurately estimate the impacts these agricultural sectors have on local economies.

Procedures

We use five basic steps to create IO accounts from crop or livestock cost and return estimates: (1) gathering control (output) total and cost and return estimates pertinent to the study region, (2) converting from purchaser prices to producer prices using retail trade margin procedures, (3) allocating cost and return accounts to IO sectors, (4) purging imports with IMPLAN regional purchase coefficients, and (5) updating a secondary model make-share matrix. IMPLAN will be used as a basis for modeling in this discussion. The IMPLAN software helps to alleviate the costs of obtaining primary data and can be easily updated with primary data such as cost and return estimates, ES202[1] data and Bureau of Economic analysis (BEA) numbers. Also, with the IMPLAN program and software, data transfers easily into spreadsheet format for model and program construction.

Control Totals and Cost and Return Estimates

After deciding which agricultural sectors will be included in the IO model, control totals must be gathered for those commodities. Control totals are values of production, employment, and income generated from each commodity. The values of production can be found using state agricultural statistics or the Department of Commerce's Census of Agriculture. These published values are based on statewide numbers and can be broken down to county or regional values based on acreage in the county or production of that commodity within the county. The employment and income values are available from the Bureau of Economic Analysis' Regional Economic Information System (REIS). The BEA publishes employment and income numbers

[1]ES-202 is an employment and wages program providing quarterly information on employment, total wages, taxable wages, and contributions from employers subject to or "covered under" State Unemployment Insurance laws (U.S. Department of Labor 1995).

for agricultural production in an aggregate format, so they must be proportioned based on employment in the cost and return estimates, ES202 state-level employment data, relative commodity output, or other methods available to the researcher. For the purposes of this study IMPLAN value-added figures were adjusted based upon their relationship with the employee compensation per dollars worth of output from IMPLAN and then multiplied by the output totals derived from Idaho Agricultural Statistics. This was done for each value-added component including employee compensation, proprietary income, other property income, and indirect business taxes and then inserted directly into the final IO vector.

Next, cost and return estimates must be constructed for each of the agricultural sectors for which control totals were compiled. The cost and return estimate is the cornerstone of an accurate and precise IO account. The more detailed cost and return estimates are, the better the production function for the IO sector will be. If more than one enterprise budget exists for a given commodity then the various costs and returns should be weighted by the amount of acreage, number of AUM's, or number of head for that agricultural sector in the study area. For this model, four cow-calf enterprise budgets were created to take into account the different production practices and their respective costs and returns. The budget values were weighted by an estimate of the number of head represented by each budget area. The weighting is Bruneau 46%, Jordan Valley 32%, Three Creek 11%, and Marsing 11%. Next, the various weighted production items from the cost and returns were summed to arrive at a localized and weighted production function for cow-calf operations in the region. For the sake of simplicity the cost and return estimates were transformed into a single vector of production purchases and gross returns for the enterprise. Table 1 shows a completed vector of weighted cost and returns associated

with range cattle production in Owyhee County (first column). For any crop that has an establishment period such as alfalfa hay or tree fruits the establishment cost for one year of production is included.

To make the model more precise the retail trade sectors are converted from producer prices to purchaser prices. The producer price is the price paid for a commodity at the factory door. The purchaser price is the price paid for a commodity at a retail outlet which includes transportation costs, wholesale mark-up, retail mark-up, and producer price (Minnesota IMPLAN Group Inc., 1997). The cost and return estimates contain purchaser prices for most of the purchased inputs; therefore, all purchases from the retail sector need to be margined. A margin is the portion of a commodity's value going to each appropriate producer such as the transportation cost, wholesaler mark-up and retail mark-up. There are different types of margins included with the IMPLAN software: household, government, and investment. The margins used in IMPLAN come from the United States Department of Commerce Summary Tape Files, but there are other sources that better represent rural retail businesses such as Financial Studies of the Small Business by Financial Research Associates that is published yearly. Margining will make the IO model more accurate in terms of the impact farm or ranch trade has on local retail businesses. In the case of Owyhee County, we know that the only margin that is not an import for the production of range cattle is the retail margin; most transportation and wholesale margins are imported. Table 1 also shows a margined vector for range cattle production in Owyhee County. For areas where it is unclear whether or not the transportation and wholesale sectors exist, IMPLAN margins or the best method available should be used to convert from producer prices and allocate costs to their respective sectors (Willis and Holland 1997).

Table 1: Weighted and Averaged Costs and Returns & Margined Cost and Return Vector for Range Cattle Sector, Owyhee County, Idaho.

Operating Costs	*Cost and Return Value*	*Margin*	*New Margined Value*
Alfalfa grass hay	$81.78	100.0%	$81.78
Meadow hay	$35.47	100.0%	$35.47
Grass hay	$8.57	100.0%	$8.57
Corn silage	$0.30	100.0%	$0.30
Feed Barley	$27.83	100.0%	$27.83
Crop aftermath	$23.07	100.0%	$23.07
Pasture	$0.36	100.0%	$0.36
State range	$1.38	100.0%	$1.38
Federal range	$13.29	100.0%	$13.29
Deeded range	$4.27	100.0%	$4.27
Protein supplement - 20%	$13.30	0.6%	$0.08
Salt	$1.24	0.6%	$0.01
Feedlot/Backgrounding	$192.57	100.0%	$192.57
Marketing	$6.67	100.0%	$6.67
Brand inspection	$0.72	100.0%	$0.72
Checkoff	$1.00	100.0%	$1.00
Commission	$1.62	100.0%	$1.62
Freight/trucking	$8.96	100.0%	$8.96
Veterinary Medicine	$22.10	100.0%	$22.10
Machinery (fuel, lubrication)	$1.88	14.7%	$0.28
Machinery (repair)	$2.82	99.6%	$2.81
Vehicles (fuel, lube)	$7.91	14.7%	$1.16
Vehicles (repair)	$11.86	99.6%	$11.82
Equipment (repair)	$0.91	99.6%	$0.90
Housing and Improvements (repair)	$5.46	100.0%	$5.46
Hired Labor	$27.27	100.0%	$27.27
Owner Labor	$27.95	100.0%	$27.95
Interest on Operating Capital	$14.00	100.0%	$14.00
Total Operating Costs	$544.56	100.0%	$521.70
Income Above Operating Costs	$100.43	100.0%	$123.29
Capital Recovery:			
Purchased Livestock	$26.66	100.0%	$26.66
Housing and Improvements	$36.32	100.0%	$36.32
Machinery	$5.85	100.0%	$5.85
Equipment	$4.97	100.0%	$4.97
Vehicles	$31.98	16.3%	$5.21
Interest on Retained Livestock	$49.38	100.0%	$49.38
Taxes	$6.31	100.0%	$6.31
Insurance	$11.05	100.0%	$11.05
Telephone/Internet	$2.95	100.0%	$2.95
Electricity	$4.42	100.0%	$4.42
Legal	$0.70	100.0%	$0.70
Accounting	$0.18	100.0%	$0.18
Dues, Fees and Publications	$1.75	100.0%	$1.75
Office Supplies	$9.44	14.6%	$1.38
Total Ownership Costs	$191.96	100.0%	$157.13
Total Costs	$736.52	100.0%	$678.83
Gross Return	$644.99	100.0%	$644.99
IMPORTS			$57.70
Returns to Risk and Management	-$91.53	100.0%	-$91.53

Allocating Cost and Return Accounts to IO Sectors

The sectors included in the aggregated Owyhee County IO model are listed in Table 2 and will be used to allocate the now margined cost and return estimates to their corresponding IO account. For the agriculture sectors, IMPLAN was used as a base, the employment totals were corrected for panel and survey data. Finally, five-year average output totals were used to conform with Idaho Agricultural statistics output data. These procedures were followed for all agricultural sectors in the model.

When allocating costs to IO accounts, some of the costs and returns items may be "lumped" together and need to be separated into two or three different accounts. However, more detailed cost and return estimates will likely have most cost items separated. Table 3 presents range cattle costs allocated to their corresponding IO accounts as defined by the availability of those industries in the Owyhee County IO model. Notice that the new IO accounts vector sums to the same amount as the value of production. This is because the IO model must balance so that purchases equal sales.

Purging Imports and Direct Requirement Calculation

The idea of IO modeling is to capture impacts to local economies. With that in mind, the new range cattle account now needs to be purged of all imports. This allows for the true regional interaction of the sector with the other sectors of the economy within the model as explained by Coupal and Holland (1995). Import purging is done through the use of regional purchase coefficients (RPC's). RPC's represent the proportion of the total local demand met by local production and attempts to account for "cross hauling" of goods (Minnesota IMPLAN Group Inc. 1997). The RPC's are generated by the IMPLAN software and may be exported for use outside of the software framework. To purge the imports from the range cattle account, each

Table 2. Owyhee County Input-Output Model Sectors.

Dairy	Employee Compensation (Residents)
Cattle Ranch	Proprietary Income (Residents)
Cattle Feedlots	Employee Compensation (Non-Residents)
Misc. Livestock	Proprietary Income (Non-Residents)
Grains	Other Property Income
Forage Crops	Indirect Business Taxes
Alfalfa Seed	U.S. Postal Service
Misc. Crops	Federal Government - Military
Sugar Beets	Federal Government - Non-Military
Agricultural Services	State & Local Government – Education
Mining	State & Local Government – Non-Education
Construction & Maintenance	Rest Of The World Industry
All Manufacturing	Inventory Change
Transportation & Communication	Households-Low Income
Electric Services	Households-Medium Income
Irrigation, Sanitary, Water Services	Households-High Income
Wholesale Trade	Federal Government Non-Defense
Misc. Retail	Federal Government Defense
Food Stores	State/Local Government Non-Education
Automotive Dealers & Service Stations	State/Local Government Education
Eating & Drinking	Corporations
F.I.R.E	Capital
Hotels and Lodging	Inventory Change
Services	Imports
Health Care	

Table 3: Cost Estimates Allocated to I/O Sectors & Import Purged I/O account for the Range Cattle Sector, Owyhee County, Idaho..

Sector	*Cost Allocation*	*RPC[1]*	*Import Purged*	*Technical Coefficients*	*IO sector $'s*
Dairy	$0.00	0.5273	$0.00	0.00%	$0
Cattle Ranch	$26.66	0.9541	$25.44	4.05%	$1,090,530
Cattle Feedlots	$192.57	0.2000	$38.51	6.14%	$1,651,209
Misc. Livestock	$0.00	0.7009	$0.00	0.00%	$0
Grains	$27.83	0.6038	$20.19	3.22%	$865,636
Forage Crops	$149.56	0.3333	$21.88	3.49%	$938,239
Alfalfa Seed	$0.00	0.9000	$0.00	0.00%	$0
Misc. Crops	$0.00	0.6888	$0.00	0.00%	$0
Sugar Beets	$0.00	0.8727	$0.00	0.00%	$0
Agricultural Services	$30.39	0.9362	$30.39	4.84%	$1,302,677
Mining	$0.00	0.9596	$0.00	0.00%	$0
Construction & Maintance	$41.78	0.6082	$25.41	4.05%	$1,089,187
All Manufacturing	$10.82	0.2000	$2.16	0.34%	$92,791
Tranportation & Communication	$11.90	0.8376	$9.97	1.59%	$427,369
Electric Services	$4.42	0.0000	$0.00	0.00%	$0
Irrigation, Sanitary, Water Serv	$0.00	0.4000	$0.00	0.00%	$0
Wholesale Trade	$0.28	0.1000	$0.03	0.00%	$1,219
Misc. Retail	$1.46	0.9382	$1.46	0.23%	$62,519
Food Stores	$0.00	1.0000	$0.00	0.00%	$0
Automotive Dealers & Service Stations	$7.34	1.0000	$7.34	1.17%	$314,502
Eating & Drinking	$0.00	0.9093	$0.00	0.00%	$0
F.I.R.E	$25.05	0.5702	$11.47	1.83%	$491,823
Hotels and Lodging	$0.00	0.1000	$0.00	0.00%	$0
Services	$18.46	0.6576	$6.76	1.08%	$289,622
Health Care	$0.00	0.3359	$0.00	0.00%	$0
Employee Comp (Residents)	$27.27	1.0000	$21.53	0.00%	$616,316
Proprietary Income (Residents)	-$14.20	1.0000	-$13.49	0.00%	$846,922
Employee Comp (Non-Residents)	$0.00	0.0000	$0.00	0.00%	$0
Proprietary Income (Non-Residents)	$0.00	0.0000	$0.00	0.00%	$0
Other Property Income	$4.27	0.8787	$3.75	0.00%	$506,115
Indirect Business Taxes	$6.31	0.9010	$5.68	0.00%	$267,358
U.S. Postal Service	$0.00	0.6219	$0.00	0.00%	$0
Federal Gvt - Military	$0.00	0.6219	$0.00	0.00%	$0
Federal Gvt - Non-Military	$13.29	0.1000	$1.33	0.21%	$56,957
State & Local Gvt - Education	$0.00	0.9001	$0.00	0.00%	$0
State & Local Gvt - Non-Education	$2.10	0.0500	$0.10	0.02%	$4,496
Rest Of The World Industry	$0.00	0.7894	$0.00	0.00%	$0
Inventory Change	$0.00	0.7894	$0.00	0.00%	$0
Households-Low Income	$0.00	0.0000	$0.00	0.00%	$0
Households-Medium Income	$0.00	0.0000	$0.00	0.00%	$0
Households-High Income	$0.00	0.0000	$0.00	0.00%	$0
Federal Gvt NonDefense	$0.00	0.0000	$0.00	0.00%	$0
Federal Gvt Defense	$0.00	0.0000	$0.00	0.00%	$0
State/Local Govt NonEducation	$0.00	0.0000	$0.00	0.00%	$0
State/Local Govt Education	$0.00	0.0000	$0.00	0.00%	$0
Corporations	$0.00	0.0000	$0.00	0.00%	$0
Capital	$0.00	0.0000	$0.00	0.00%	$0
Inventory Change	$0.00	0.0000	$0.00	0.00%	$0
Imports	$57.44	0.0000	$425.08	67.74%	$18,224,191
COLUMN TOTAL	$644.99		$644.99	1.00	$29,139,677

item in the vector of margined costs is multiplied by the RPC generated for that industry. This process will not change the total output or value of production for the IO account; all that is done is a transformation of the vector into local purchases and imports of all other commodities and services. Some imports were already derived when margining the retail trade sectors.

With the imports now purged from the IO account, the technical coefficients for the new agricultural sector can be derived. Dividing the vector of now margined and import-purged costs by the value of production results in a vector of technical coefficients. Once the direct requirement vector (or matrix with all sectors in the IO model) is constructed, all that is needed for updating the IO model, if all production functions remain unchanged, is the output (value of production for agricultural sectors), income, and employment estimates. These estimates of output can be multiplied through the direct requirement matrix and re-balanced to create an updated model. Table 3 illustrates the import purged IO accounts and the technical coefficients as derived for the range cattle sector in Owyhee County, Idaho.

IO Model Application

IO models can be used to show economic impacts from governmental policy, business introduction, and other potential changes in a local or regional economy. To derive economic impacts from a change or "shock" to an economy, we must first decide whether it is a change to final demand or to output. Final demand changes are changes in purchases of goods and services for final consumption such as purchases made by the federal government or households. These purchases may be food, computers, houses, buildings or any other good or service. Output changes are sales or value of production (agricultural commodities) from a given industry. These sales can be anything ranging from alfalfa hay and cattle to gold and electronic parts.

Table 4 presents the total economic impact of the range cattle sector on the Owyhee County economy. Direct output for this sector is about $29 million. Removing range cattle from the county economy would reduce output from not only the agricultural sectors, but also from construction, transportation, services, and other sectors. The indirect or induced impacts are over $10 million. The overall economic impact would be over $41 million.

In Owyhee County, one AUM of forage (public or private) was estimated to be worth $46.85 in output from the range livestock sector. The economic value of a single AUM is displayed in Table 5. The indirect or induced impact of an AUM is about $16. The total economic impact of each AUM is almost $67.

A recent court case sought the removal of 22,227 AUMs from the Owyhee Resource Area. Table 6 displays the impact of this proposal. Valuing each AUM at $46.85, the total output change from a reduction of 22,227 AUMs is $1,041,335. This reduction in output induces an additional impact of over $360,000. The total impact is about $1,488,000. Table 6 allow us to see how this impact is distributed between the sectors of the local economy. In addition to losses in output in the range cattle sector, other sectors will see output reductions based on the purchasing patterns of ranches. Agricultural sectors primarily impacted include feedlots, grain production, forages, and agricultural services (fertilizer, veterinarians, etc.). Non-agricultural sectors primarily impacted include construction, transportation, auto dealers and service stations, finance, insurance and real estate (FIRE) and households (regional income).

Table 4: Economic Impact of Range Cattle Sector on Owyhee County Economy.

	Impacts				
	Direct Output	***Indirect/Induced Output***	***Total Output***	***Value-Added***	***Total Employment***
Dairy	$0	-$735	-$735	-$289	0.00
Range Cattle	-$29,139,676	$0	-$29,139,676	-$1,836,310	(104.00)
Cattle Feedlots	$0	-$1,712,489	-$1,712,489	-$298,494	(26.25)
Misc. Livestock	$0	-$4	-$4	-$1	0.00
Grains	$0	-$952,630	-$952,630	-$486,358	(14.68)
Forage Crops	$0	-$1,019,279	-$1,019,279	-$238,107	(17.25)
Alfalfa Seed	$0	$0	$0	$0	0.00
Misc. Crops	$0	-$3,585	-$3,585	-$2,581	(0.03)
Sugar Beets	$0	-$14	-$14	-$9	0.00
Agricultural Services	$0	-$552,397	-$552,397	-$175,877	(21.82)
Mining	$0	-$218	-$218	-$95	0.00
Construction & Maintance	$0	-$1,128,724	-$1,128,724	-$208,263	(14.86)
All Manufacturing	$0	-$197,319	-$197,319	-$20,189	(1.97)
Tranportation & Communication	$0	-$554,234	-$554,234	-$236,268	(5.41)
Electric Services	$0	-$19,729	-$19,729	-$12,997	(0.07)
Irrigation, Sanitary, Water Services	$0	-$114,853	-$114,853	-$55,651	(1.18)
Wholesale Trade	$0	-$76,221	-$76,221	-$27,444	(0.98)
Misc. Retail	$0	-$165,128	-$165,128	-$29,686	(2.57)
Food Stores	$0	-$50,827	-$50,827	-$28,484	(1.88)
Auto Dealers & Service Stations	$0	-$348,481	-$348,481	-$148,719	(7.81)
Eating & Drinking	$0	-$43,638	-$43,638	-$14,175	(1.79)
F.I.R.E	$0	-$626,513	-$626,513	-$357,793	(6.54)
Hotels and Lodging	$0	-$5,325	-$5,325	-$1,527	(0.17)
Services	$0	-$503,072	-$503,072	-$129,193	(14.33)
Health Care	$0	-$98,084	-$98,084	-$12,533	(2.33)
Regional Income	$0	-$1,912,647	-$1,912,647	$0	0.00

	Direct Impacts	***Indirect/Induced Impacts***	***Total Impacts***
Total Industry Impacts	($29,139,676)	($8,173,499)	($37,313,175)
Total Value Added Impacts			($4,321,044)
Total Regional Income Impact	$0	($1,912,647)	($1,912,647)
Total Employment Impacts			(246)
Total Economic Impacts	($29,139,676)	($10,086,146)	($41,634,220)

Table 5: Economic Value of a Single AUM to Owyhee County Economy.

	Impacts				
	Direct Output	*Indirect/Induced Output*	*Total Output*	*Value-Added*	*Total Employment*
Dairy	$0	$0	$0	$0	0
Range Cattle	($47)	$0	($47)	($3)	0
Cattle Feedlots	$0	($3)	($3)	($0)	0
Misc. Livestock	$0	$0	$0	$0	0
Grains	$0	($2)	($2)	($1)	0
Forage Crops	$0	($2)	($2)	($0)	0
Alfalfa Seed	$0	$0	$0	$0	0
Misc. Crops	$0	($0)	($0)	$0	0
Sugar Beets	$0	$0	$0	$0	0
Agricultural Services	$0	($1)	($1)	($0)	0
Mining	$0	$0	$0	$0	0
Construction & Maintance	$0	($2)	($2)	($0)	0
All Manufacturing	$0	($0)	($0)	($0)	0
Tranportation & Communication	$0	($1)	($1)	($0)	0
Electric Services	$0	($0)	($0)	($0)	0
Irrigation, Sanitary, Water Services	$0	($0)	($0)	($0)	0
Wholesale Trade	$0	($0)	($0)	($0)	0
Misc. Retail	$0	($0)	($0)	($0)	0
Food Stores	$0	($0)	($0)	($0)	0
Auto Dealers & Service Stations	$0	($1)	($1)	($0)	0
Eating & Drinking	$0	($0)	($0)	($0)	0
F.I.R.E	$0	($1)	($1)	($1)	0
Hotels and Lodging	$0	($0)	($0)	$0	0
Services	$0	($1)	($1)	($0)	0
Health Care	$0	($0)	($0)	($0)	0
Regional Income	$0	($3)	($3)	$0	0

	Direct Impacts	*Indirect/Induced Impacts*	*Total Impacts*
Total Industry Impacts	($46.85)	($13.14)	($59.99)
Total Value Added Impacts			($6.95)
Total Regional Income Impact	$0.00	($3.08)	($3.08)
Total Employment Impacts			0
Total Economic Impacts	($46.85)	($16.22)	($66.94)

Table 6: Economic Impact of 22,227 AUM Reduction in Owyhee Resource Area.

	Impacts				
	Direct Output	***Indirect/Induced Output***	***Total Output***	***Value-Added***	***Total Employment***
Dairy	$0	($26)	($26)	($10)	0.00
Range Cattle	($1,041,335)	$0	($1,041,335)	($65,622)	(3.72)
Cattle Feedlots	$0	($61,197)	($61,197)	($10,667)	(0.94)
Misc. Livestock	$0	($0)	($0)	($0)	0.00
Grains	$0	($34,043)	($34,043)	($17,380)	(0.52)
Forage Crops	$0	($36,425)	($36,425)	($8,509)	(0.62)
Alfalfa Seed	$0	$0	$0	$0	0.00
Misc. Crops	$0	($128)	($128)	($92)	0.00
Sugar Beets	$0	($0)	($0)	($0)	0.00
Agricultural Services	$0	($19,740)	($19,740)	($6,285)	(0.78)
Mining	$0	($8)	($8)	($3)	0.00
Construction & Maintance	$0	($40,336)	($40,336)	($7,442)	(0.53)
All Manufacturing	$0	($7,051)	($7,051)	($721)	(0.07)
Tranportation & Communication	$0	($19,806)	($19,806)	($8,443)	(0.19)
Electric Services	$0	($705)	($705)	($464)	0.00
Irrigation, Sanitary, Water Services	$0	($4,104)	($4,104)	($1,989)	(0.04)
Wholesale Trade	$0	($2,724)	($2,724)	($981)	(0.04)
Misc. Retail	$0	($5,901)	($5,901)	($1,061)	(0.09)
Food Stores	$0	($1,816)	($1,816)	($1,018)	(0.07)
Auto Dealers & Service Stations	$0	($12,453)	($12,453)	($5,315)	(0.28)
Eating & Drinking	$0	($1,559)	($1,559)	($507)	(0.06)
F.I.R.E	$0	($22,389)	($22,389)	($12,786)	(0.23)
Hotels and Lodging	$0	($190)	($190)	($55)	(0.01)
Services	$0	($17,978)	($17,978)	($4,617)	(0.51)
Health Care	$0	($3,505)	($3,505)	($448)	(0.08)
Regional Income	$0	($68,350)	($68,350)	$0	0.00

	Direct Impacts	***Indirect/Induced Impacts***	***Total Impacts***
Total Industry Impacts	($1,041,335)	($292,088)	($1,333,423)
Total Value Added Impacts			($154,417)
Total Regional Income Impact	$0.00	($68,350)	($68,350)
Total Employment Impacts			(9)
Total Economic Impacts	($1,041,335)	($360,438)	($1,487,840)

Discussion and Conclusions

Typically cost and return estimates are a useful tool when used as guidelines for appraisers, bankers and farmers to benchmark different farm and ranch operations. These tools can also transform a typical "black box" or national-based use table into a more precise local or regional matrix. With the steps outlined above, a typical IO model can be updated to be more accurate without gathering costly primary data through survey techniques. This allows for the addition of IO accounts not typically found in most IO packages on the market.

There is an increasing demand for economic impact studies of agricultural commodity production in rural areas because of federal, state, and local policy decisions. Our lawmakers and concerned citizens need this information to be as accurate as possible when making decisions that affect others' livelihood. Using enterprise budgets helps to make these impact assessments more accurate and allows the researcher simply to create IO accounts and insert them into IMPLAN's current framework or a "mongrel" IO model for impact estimation. With minimal effort the base IMPLAN make-and-use tables for a state, county, or region can be changed along with all the control totals to match local data sources and, therefore, result in a more accurate estimation of impacts as well as the ability to change and aggregate models to suit the needs of the impact assessment.

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