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Michael J. Murray¹

Abstract

The Employer of Last Resort (ELR) program is a New Deal type of program to provide a government position for anyone seeking work. Unlike private industries who compete over prices and wages, the ELR “industry” is not meant to compete with the private sector; rather it provides public services that are not offered by the private sector. The task here is to estimate the private sector effects of the implementation of the ELR program for the State of Missouri.

JEL Codes: B51, C3, E11, E12, E23, E24

Keywords

job guarantee, input-output modeling, unemployment, full employment

I. Targeted Demand Management and the Employer of Last Resort Program

The Employer of Last Resort (ELR) program is a New Deal type of program that provides government positions to anyone seeking work. Unlike private industries who compete over prices and wages, the ELR “industry” is not meant to compete with the private sector; rather it provides public services that are not offered by the private sector. The task here is to estimate the private sector effects of the implementation of the ELR program for the State of Missouri.

The economy is modeled in the traditional Keynesian sense, with the exception that employment, income, and output are disaggregated. This modeling approach is unlike the traditional Keynesian model found in *The General Theory* and in textbooks alike. The traditional Keynesian model represents aggregate output, aggregate earnings, and aggregate employment by one variable. By separating out aggregate output, earnings, and employment, we can reflect the reality that Keynesian policies are not to “prime the pump” to close the recessionary gap; rather appropriate Keynesian policies rely on a targeted demand approach (Tcherneva 2008). Earnings are expended on consumer goods across industries. Each industry’s decision to expand employment in response to changes in final demand will be different and will be based upon the technical requirements of production specific to each industry.

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Regional economic modeling of ELR programs creates the ability to identify the economic sectors that are affected by ELR employment, and to estimate the degree in which they are affected. It enables researchers to model the private sector benefits, specifically the additions to private sector output, earnings, and employment. Such an approach is applied here for the State of Missouri. Data were collected from the Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS). The most recent estimates available were used to perform the analysis.

2. The Simple Theory of Economic Activity

The forthcoming analysis will estimate the private sector economic impact after the implementation of an ELR program. The analysis will rely on regional output, earnings, and employment multipliers for the State of Missouri. The analysis fits in neatly within a heterodox modeling of the economy, specifically the Effective Demand Model of Edward J. Nell (1998: 107-215, 1978, 2000).

The Effective Demand Model (from here referred to as the Nell model) is a variant of the traditional Keynesian model; the Keynesian model confounds aggregate income, aggregate output, and aggregate employment, whereas the Nell model makes these variables explicit. Consistent with Keynes, the Nell model describes an economy with persistent unemployment. It is not the interest of capitalists to maintain a fully employed economy. It is the interest of capitalists to maintain a "sufficient supply of available workers" (Rose 1995: 12).

2.1 Simple Economic Model

The depiction of the economy is described by the following structural relationships. Aggregate employment (N) is dependent upon aggregate output (Q), which corresponds to a predetermined level of final demand (Y_e). Only in special circumstances will this level of output be consistent with full employment (N_f). The level of employment (N), in time (t), is a function of the level of aggregate economic activity and the technical requirements of production. The business enterprise makes investment, employment, and output decisions dependent upon final demand. The pricing model is a mark-up over cost of production at a normal rate of output (Lee 2010: 31). Pricing, output, and employment decisions are made to ensure the generation of cash flows required to meet profit expectations of those within the enterprise and among its shareholders, and to validate previous investment funded through external sources.

Aggregate consumption (C) will be a function of wage income (w) plus transfer payments by the government in the form of unemployment insurance compensation made to those who are officially unemployed. Weekly unemployment benefits vary state to state, but generally they replace on average 60 percent of the individual's average weekly pre-tax wage.

Investment spending (I) is equal to aggregate profits (π) plus external financing (ρ). This means that we would expect to find investment and profits to be highly correlated in the actual economy. This assumption is easily validated by the Flow of Funds Accounts of the United States. Last, government spending is assumed to be autonomous (G). The structural model of production displayed in the system of equations (equation (1)) is a slightly modified Nell model and is displayed graphically in Figure 1.

$$Y_{it} = C_{it} + I_{it} + G_{it} \quad (1)$$

$$N_{it} = I_i Q_{it} \quad (2)$$

$$W_t = wN_t \quad (3)$$

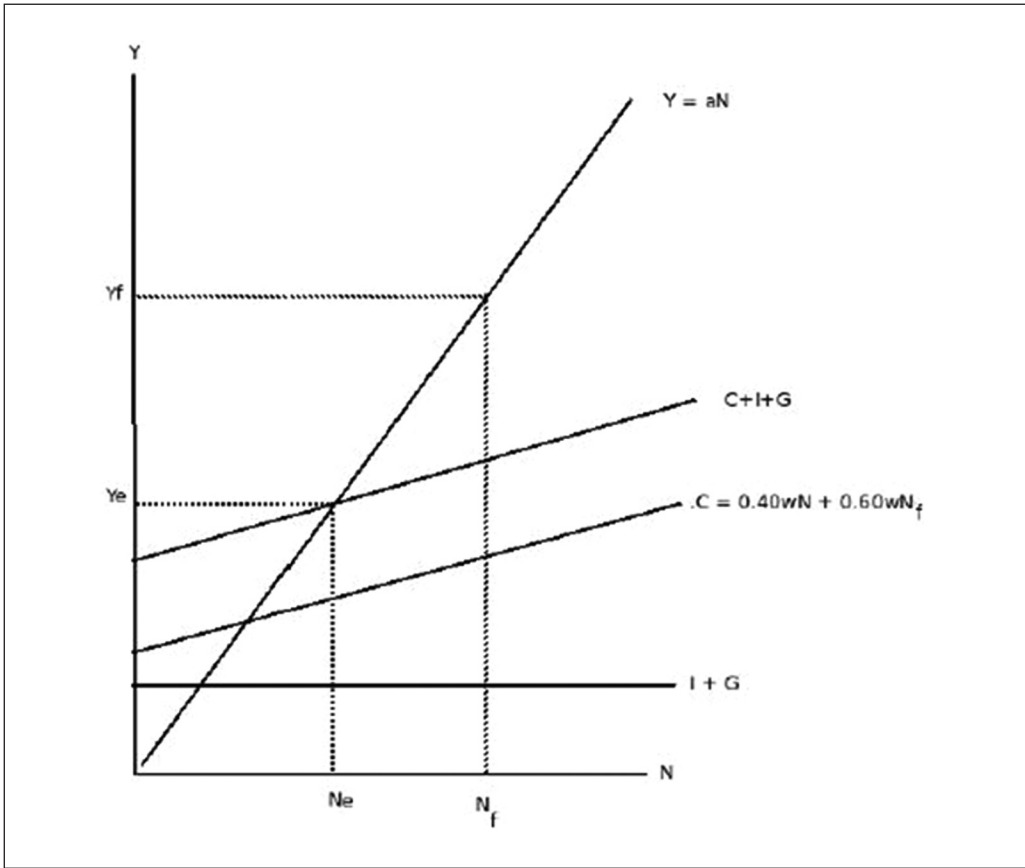


Figure 1. Nell's Effective Demand Model

$$C_{it} = 0.40wN_t + 0.60wN_{ft} \quad (4)$$

$$I_{it} = \pi_{it} + \rho \quad (5)$$

$$G_{it} = G_t \text{ (excludes transfer payments)}$$

2.2 Circular Production and the Nell Model

The structural equations given for consumption, investment, and government spending may easily be derived from National Income and Product Accounts (NIPA) which disaggregate the economy into final demand components and inter-industry relationships displaying circular production as a social process. The balance between total equilibrium output (Y_e) and combined inputs (represented by the standard technology matrix (A)) can be generalized as:

$$A \times Q + Y_e = Q \quad (7)$$

Solving (2) for aggregate output at equilibrium Y_e yields:

$$(I - A) \times Q = Y_e \quad (8)$$

Table 1. Economic Sectors

NAICS Code	Industry
11	Agriculture, Forestry, Fishing and Hunting
21	Mining, Quarrying, and Oil and Gas Extraction
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information
52-53	Finance and Insurance and Real Estate and Rental and Leasing
54	Professional and Business Services
61-62	Educational Services, Health Care, and Social Assistance
71-72	Arts, Entertainment, Recreation, Accommodation, and Food Services
81	Other Services (except Government)
92	Government
HH	Households

The equilibrium level of employment (N_e) is given as:

$$\mathbf{I} \times \mathbf{Q} = N_e \quad (9)$$

The vector, \mathbf{I} , is the amount of labor required per unit of output, based upon the technical requirements of production.

3. Application of the Nell Model for Regional Data

The simulation will utilize Regional Input-Output Models System (RIMS) II multipliers. These multipliers from the BEA are based upon the standard Leontief multiplier. The RIMS II dataset provides the user with final demand multipliers for output, earnings, and employment. The final demand multiplier for output indicates the change in output in each row industry that results in a \$1 change in final demand in the column industry. The multiplier for earnings is indicated by a \$1 change in earnings in each row industry that results from a \$1 change in final demand in the column industry. The final demand multiplier for employment indicates a \$1 million change in final demand in the column industry. The RIMS II multipliers are static, since they are based on static input-output data. They lack the appropriate time dimension; however, since they are based on annual data, it is customary to assume that the economic impacts occur in one year (Ehrlich et al. 1997).

3.1 Estimating the Impact of an Employer of Last Resort Program using Regional Data

In order to estimate the regional impact of the ELR program on private sector income, output, and employment, the final demand multipliers must first be derived. Aggregate output is decomposed by sector corresponding to the BEA 2002 Benchmark Input-Output Data. The aggregate industries are given in Table 1.

Table 2. Use Table

NAICS Code	2002-Benchmark Industry	PCE (Dollars)	% Total PCE
11	Agriculture, Forestry, Fishing and Hunting	\$48,655.10	0.00645764
21	Mining	118.3	0.00001570
22	Utilities	171,307.3	0.022736403
23	Construction	0.00	0.0
31-33	Manufacturing	1,248,059.2	0.16564604
42	Wholesale Trade	303,995.40	0.040347153
44-45	Retail Trade	789,492.3	0.1047837
48-49	Transportation and Warehousing	161,939.0	0.021493015
51	Information	311,503.2	0.0413436
52-53	Finance, Insurance, Real Estate, Rental, and Leasing	1,845,786.9	0.244978203
54-56	Professional and Business Services	160,652.30	0.02132224
61-62	Educational Services, Health Care, and Social Assistance	1,403,815.10	0.186318421
71-72	Arts, Entertainment, Recreation, Accommodation, and Food Services	571,252.80	0.0758183
81	Other Services, except Government	401,797.60	0.05332774
92	Government	47,774.0	0.00634070
HH	Households	68,345.9	0.00907106
Summation	—	\$7,534,494.40	1.00

3.2 Estimating Consumption Effects

The effect additional income has on private sector industries depends upon the composition of consumption across industries. Additional consumption in any sector has multiplier effects due to inter-industry linkages over all sectors of the economy. Unfortunately, Personal Consumption Expenditure (PCE) is unavailable at the state level so national PCE data serve as an adequate proxy for the state (refer to appendix). National PCE is derived from the dataset Use of Commodities by Industries; 2002 I-O Benchmark (Use Table). Table 2 details the commodities that are consumed by final users in dollars (replicated from the appendix), and an additional calculated column detailing the consumption of commodities as a percentage of total consumption.

Table 2 represents a proxy for PCE for each industry for the State of Missouri. The important column from Table 2 for the analysis to follow is the column “% of Total PCE.” This column is the percentage of total consumption spent on commodities in each industry. The column details the distribution of consumption by each industry from an additional dollar spent. This column will serve as weights for the regional multipliers.

3.3 Regional Multipliers

The regional income, output, and employment multipliers are supplied from the BEA RIMS II dataset for the State of Missouri. Regional multipliers detail the amount of additional output, income, and employment that results from an increase in aggregate consumption for each industry. The regional final demand multipliers for the State of Missouri supplied by the BEA must first be weighted by the column “% Total PCE” from Table 2 to derive a “weighted multiplier.” The final demand multipliers are weighted as such to take into account the distribution of consumption expenditures across industries.

Table 3. Weighted Multipliers

NAICS	Industry	Output (\$)	Earnings (\$)	Employment (jobs)	PCE-Wght*Out	PCE-Wght*Earn	PCE-Wght*Empl.
11	Agriculture	2.14855625	0.41719375	16.4376125	0.013874616	0.00269409	0.10614828
21	Mining	1.950863636	0.4148	16.21231875	0.0000306307	0.00000651282	0.00025455
22	Utilities	1.6993	0.4163	15.625325	0.038635969	0.009465165	0.35526368
23	Construction	2.317	0.3871125	14.2273625	0	0	0
31-33	Manufacturing	2.064902878	0.3943	13.545275	0.342042995	0.065314236	2.243721
42	Wholesale Trade	1.9288	0.39488125	12.90690625	0.077821589	0.015932334	0.52075692
44-45	Retail Trade	1.9899	0.4006125	12.5394625	0.208509111	0.041977665	1.31393144
48-49	Trans. and Wrhsg	2.111155556	0.4099375	12.328375	0.045375098	0.008810793	0.26497394
51	Info.	1.980554545	0.4099	11.867425	0.081883275	0.016946746	0.49064219
52-53	Finance, insurance, and Real Estate	1.940430769	0.467846154	13.98557692	0.475363243	0.11461211	3.426164
54	Professional Services	2.060504167	0.665875	19.	0.043934565	0.014197947	0.41667424
61-62	Education and Health	2.162945455	0.714945455	27.74678182	0.402996582	0.133207508	5.1697365
71-72	Arts and Entr.	2.048483333	0.583408333	26.22474167	0.15531259	0.044233047	1.98831617
81	Other Services	2.060975	0.46401875	10.9823375	0.10990715	0.024745074	0.58566329
92	Government	2.17705	0.49589375	11.86860625	0.01380403	0.003144316	0.07525532
HH	Households	1.4008	0.4927375	12.276525	0.01270675	0.004469655	0.11136117

The weighted multipliers are used to calculate the economic impact of additional consumption afforded by the implementation of an ELR program. The weighted output, income, and employment multipliers are given in Table 3. The Weighted Output Multiplier represents the addition to output for *Industry X* resulting from a \$1 change in final demand for *Industry X*. The Weighted Earnings Multiplier represents the addition to earnings for *Industry X* resulting from a \$1 change in final demand for *Industry X*. The Weighted Employment Multiplier represents the addition to employment for *Industry X* resulting from a \$1 million change in final demand for *Industry X* (Ehrlich et al. 1997: 2-5). The weighted multipliers are displayed in the last three columns of Table 3.

4. Simulating the Impact of ELR for the State of Missouri

The direct private sector economic impact from the creation of an ELR program for the State of Missouri can now be simulated. Assume that all eligible workers will enter into the ELR workforce. The best current estimate for this measure is the 2010 U-6 unemployment rate. The U-6 unemployment rate consists of those who are officially unemployed, plus discouraged workers, involuntary part-timers, and those who are marginally attached to the workforce, which is the broadest definition for the unemployment rate the Bureau of Labor Statistics provides. In 2010 Missouri had 286,900 workers officially unemployed, 158,100 involuntary part timers, 39,800 workers unemployed due to lack of transportation or family responsibilities, and 20,400 discouraged workers.²

To calculate additional consumption from ELR employment some assumptions will be made.

4.1 Assumptions for Simulations

1. ELR income completely replaces unemployment compensation. All those who were previously eligible received unemployment compensation.

²Source: "Measures of Labor Underutilization, Missouri - 2010" *BLS Press Release* July 7, 2011.

2. Missouri ELR workforce: official unemployed + .5(involuntary part-timers) + marginally attached + discouraged workers
 - (a) Missouri 2010 ELR workforce: $286,900 + .5(158,100) + 39,800 + 20,400 = 426,150$ workers
3. 2010 Missouri ELR wage: 2010 State of Missouri minimum wage = \$7.25
4. Work year: 2,000 hours
5. Payroll deduction: Assuming the workers net income is 70 percent of their gross wages (after deduction of federal, state, and local taxes, FICA, Medicare, etc.)
 - (a) Individual ELR worker's annual income: $.70(\$7.25 \times 2,000\text{hr/yr}) = \$10,150/\text{yr}$
6. All ELR wage income is spent on consumption goods and savings out of ELR wages is zero.

The assumption now made is that a one dollar increase in income represents a one dollar increase in final demand, to be divided among the given industries according to their weights given in the last three columns of Table 3. This effectively means that workers save nothing. This assumption is not unreasonable as each worker only receives \$10,150 in after-tax income annually from ELR employment. Workers in lower income brackets have lower marginal propensities to save. The assumption that the ELR workforce spends their entire wages on consumption seems to be valid.

4.2 Effects of ELR Income on the Private Sector

Following the assumptions from the preceding section, I now analyze the economic impact of an ELR program for the State of Missouri in 2010. The first step in deriving the economic impact is to calculate the *change* in aggregate consumption after the implementation of the ELR program.

It is assumed that ELR income replaces unemployment compensation, but not all workers who entered the ELR program were eligible for unemployment compensation; only 286,900 workers who were officially unemployed were eligible. Assuming unemployment insurance subsidizes 60 percent of private-sector income, ELR employment would add an additional 40 percent of income equaling an additional \$4,060 of after-tax income.³

To calculate the additional income for the Missouri ELR workforce as a whole, divide the ELR workforce up into two groups: those who were officially unemployed and previously receiving benefits, and those who did not receive benefits prior to ELR employment. Those who were officially unemployed prior to joining the ELR will enjoy an additional \$4,060 after-tax income from ELR employment, and those who were not officially unemployed but still out of work will enjoy an additional \$10,150 per year of after-tax income from ELR employment. Total annual 2010 ELR income for the State of Missouri becomes:

$$(286,000 \times \$4,060) + (140,150 \times \$10,150) = \$2,583,682,500 \quad (10)$$

³This result is only valid if all those who received unemployment compensation previously held private sector employment paying the state minimum wage of \$7.25/hr. A more exhaustive study would need to analyze the exact unemployment compensation of all individuals making claims. In reality some individuals who collected unemployment insurance, and who made at or over \$24,166 annually from private sector employment, would be taking a monetary loss from accepting ELR employment at the state minimum wage rather than receiving unemployment compensation at 60 percent of their previous annual wage.

Table 4. Additional Private Sector Stimulus from Consumption Spending out of ELR

Industry	Addition to Output	Addition to Earnings	Addition to Employment
Agriculture	35847603.46	6960672.366	2742.53473
Mining,	79140.11691	16827.07078	6.57680412
Utilities	99823077.94	24454979.9	9178.88563
Construction	0	0	0
Manufacturing	883730501.5	168751247.6	57970.632
Wholesale Trade	201066278	41164093.31	13454.7055
Retail Trade	538721340.7	108456959.2	33947.8167
Transportation and Warehousing	117234845.9	22764291.1	6846.08549
Information	211560385.3	43785010.68	12676.636
Finance, Insurance, and Real Estate	1228187693	296121303.2	88521.1352
Professional and business services	113512966.6	36682986.55	10765.5395
Educ. and Health	1041215216	344165907.9	133569.579
Arts and Entertainment	401278420.9	114284149.1	51371.7771
Other Services	283965180.9	63933414.18	15131.6801
Government	35665230.73	8123913.098	1944.3585
Households	32830207.61	11548168.49	2877.21919
TOTAL	5224718089	1291213924	441005.1634

5. Additional Private Sector Stimulus from an ELR Program for the State of Missouri in 2010

Equation (10) states that roughly an additional \$2.58 billion would be spent on ELR wages for the State of Missouri in 2010. This also means that private consumption expenditure will increase by \$2.58 billion. To calculate the effects this additional income has on private sector output and earnings, multiply the \$2,583,682,500 in additional income by the Weighted Output Multipliers and Weighted Earnings Multiplier given in Table 3 for each industry. Recall, the regional employment multipliers are for a \$1 million change. To calculate the effect that ELR income has on private sector employment, divide first \$2,583,682,500 by \$1,000,000 = \$2,583.6825 then multiply this by the Weighted Employment Multiplier for all industries as given in Table 3.

The multiplier effects that an ELR program has on private sector output, earnings, and employment for all industries for the State of Missouri in 2010 are given below in Table 4.

6. Summary of Results

The implementation for the ELR program in the State of Missouri for 2010 would cost around \$2.58 billion of additional government spending in the form of ELR after-tax wages. From Table 4 the multiplier effect for the State of Missouri would result in an additional \$5,224,718,089 of output and an additional \$1,291,213,924 in private sector earnings. Further, and most importantly, the results illustrate that the increase in consumer demand from ELR income would result in an additional 441,005 private sector jobs. This outcome effectively means that the ELR program could potentially result in near *private sector* full employment in the private sector for the estimated 505,200 who are either unemployed or involuntarily working part-time. This result is simply because the additional income provided by ELR employment must be spent in the private sector, which translates to more private sector output, private sector earnings, and private sector jobs.

These results also illustrate that there may be no better government policy to promote the creation of private sector jobs than for government to provide jobs, and additional disposable income, for all those willing and able to work. An effective method of achieving this is through the

7. Appendix

Table 2. The Use of Commodities by Industries before Redefinitions, 2002
(Millions of dollars at producers' prices)

Commodity code	For the distribution of commodities consumed by an industry, read the column for that industry. For the distribution of industries consuming a commodity, read the row for that commodity.	Total intermediate use	Personal consumption expenditures	Private fixed investment	Change in private inventories	Exports of goods and services	Imports of goods and services	Government consumption and gross investment	Total final uses (GDP)	Total commodity output
	Industry code	T001	F010	F020	F030	F040	F050	F100	T004	T007
1	Agriculture, forestry, fishing and hunting	230,922.6	48,655.1	0.0	-3,756.4	20,975.9	-24,584.8	0.0	40,889.8	274,812.4
2	Mining	232,504.0	118.3	30,444.1	-2,781.9	3,768.2	-93,985.2	0.0	-82,436.5	170,067.5
3	Utilities	215,962.7	171,307.3	0.0	0.0	524.3	-1,201.2	0.0	170,630.4	386,593.1
4	Construction	165,143.6	0.0	662,526.2	0.0	65.7	0.0	216,627.6	879,219.5	1,032,363.1
5	Manufacturing	2,410,017.5	1,248,059.2	565,745.3	13,781.4	495,414.9	-1,014,741.4	84,363.9	1,392,623.3	3,802,640.8
6	Wholesale trade	381,193.4	303,959.4	86,311.6	2,288.1	68,164.4	19,917.0	9,658.6	490,335.1	871,528.5
7	Retail trade	81,699.5	789,492.3	37,103.4	0.0	0.0	0.0	0.0	826,595.7	906,295.2
8	Transportation and warehousing	377,238.7	161,939.0	19,459.6	207.9	58,334.2	-12,102.2	1,939.4	298,777.9	607,006.6
9	Finance, insurance, real estate, rental, and leasing	1,579,109.0	311,503.2	59,242.4	-206.2	26,305.4	-3,597.6	6,928.7	400,175.9	779,412.1
10	Professional and business services	1,873,935.5	1,845,788.9	70,653.0	0.0	80,157.8	-27,142.3	0.0	1,969,660.4	3,548,769.4
11	Educational services, health care, and social assistance	45,597.2	1,403,815.1	159,571.5	0.0	56,851.9	-8,969.6	21,369.6	399,475.7	2,263,411.2
12	Arts, entertainment, recreation, accommodation, and food service	188,733.2	571,252.8	0.0	0.0	603.0	-110.0	0.0	1,404,023.1	1,449,620.3
13	Other services, except government	169,431.5	401,797.6	0.0	0.0	141.4	-1,971.9	0.0	571,745.8	769,469.0
14	Government	73,519.7	47,774.0	0.0	0.0	237.6	0.0	1,632,810.3	4,000,097.1	559,488.6
15	Scrap, used and secondhand goods	16,766.2	63,345.9	-85,525.3	4,142.3	7,692.3	-8,041.3	2,637.7	1,680,821.9	1,754,341.8
17	Other inputs	104,164.5	-35,985.1	2,757.8	0.0	89,812.4	-158,059.6	0.0	-101,154.5	5,214.8
T005	Total intermediate inputs	8,595,135.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V001	Compensation of employees	6,096,629.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V002	Taxes on production and imports, less subsidies	724,368.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
V003	Gross operating surplus	3,850,972.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T006	Total value added	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10,671,899.2	0.0
T008	Total industry output	0.0	7,498,329.3	1,608,491.6	13,675.2	909,752.3	-1,335,385.0	1,976,535.8	0.0	19,480,034.2

* Includes noncomparable imports and rest-of-the-world adjustments.
Note: Detail may not add to total due to rounding.

Figure 2. The Use of Commodities by Industry

creation and implementation of an Employer of Last Resort program. The ELR program will start off as a “big-government” program, but over the course of a year it will dwindle down. For the State of Missouri, it has been shown that if this program were implemented in 2010, the ELR program will start off costing roughly \$2.5 billion, but will be *substantially less* after the course of a year.

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Bio

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