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Economic Consequences of Layoffs at the Red River Ammunition Depot in 2018

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The International Association of Machinists and Aerospace Workers at Local Lodge 1243 asked the Arkansas Economic Development Institute (AEDI) to evaluate the economic impact linked to a layoff at the Red River Army Depot. In response to this request, researchers at AEDI utilized a RIMS II model to estimate the economic impacts of this layoff on the associated Texarkana Labor Shed.¹ The economic impact analysis was broken into two parts. The first part of this study analyzed the economic impacts associated with the reductions in workers' earnings and local consumption expenditures. The focus of the second part of this study was the expected direct and indirect effects associated with reduced business to business activities that could result from the layoff.

Background

Red River Army Depot Facts

The Federal Government established Red River Army Depot (RRAD) in 1941 as an ammunition storage facility. In 1995 and again in 2015, the Base Realignment and Closure Commissions (BRAC) slated the depot for deactivation. However, it has remained open to remanufacture and repair combat system and tactical vehicles.² According to a 2015 report by the Texas Comptroller, RRAD employed approximately 5,400 employees, had a payroll of \$569.8 million, and had contracts for construction, supplies, and services approaching \$946.2 million for fiscal years 2015 and 2016.³ Utilizing a REMI model for Texas, the report also found RRAD's total contribution to the Texas economy amounted to 16,936 statewide jobs that supported \$2.1 billion of economic activities in Texas, and added \$1.4 billion to the states Gross Domestic Product (GDP).⁴

Texarkana Labor Shed Area

Local Lodge 1243 provided a count of the number of laid off workers at RRAD by their counties of residence. Using this data, researchers at AEDI were able to define an appropriate labor shed area to construct a RIMS II model for the economic impact modeling. The Texarkana Labor Shed consists of the three counties that comprise the Texarkana MSA (Bowie, Miller, and Little River) as well as Red River and Cass counties. A small percentage of workers reside in five additional counties in the region, but their place of residence was deemed too far removed from the RRAD to have a significant economic

¹ RIMS II is an economic impact modeling system developed and maintained by the U.S. Bureau of Economic Analysis, <https://blog.bea.gov/tag/rims-ii/>

² Red River Army Depot, Wikipedia.org, https://en.wikipedia.org/wiki/Red_River_Army_Depot

³ Hegar, Glenn, Texas Comptroller of Public Accounts. *Red River Army Depot Estimated Contribution to the Texas Economy, 2015*, Comptroller.Texas.Gov, <https://comptroller.texas.gov/economy/economic-data/military/red-river.php>

⁴ REMI model refers to economic modeling software developed by Regional Economic Modeling Incorporated, Amherst, MA. <https://remi.com>

impact on the Texarkana region. Table 1 shows the distribution of workers within the labor shed and the region.

Table 1		Study Areas in Texarkana Region		
County	State	Number of Workers	% of Workers in Labor Shed	% of Workers in Region
Bowie	TX	354	64.2%	60.5%
Miller	AR	92	16.7%	15.7%
Little River County	AR	34	6.2%	5.8%
Texarkana MSA		480	87%	82%
Red River	TX	39	7.1%	6.7%
Cass County	TX	32	5.8%	5.5%
Texarkana Labor Shed		551	100%	94%
Hempstead	AR	12		2.1%
Howard	TX	4		0.7%
McCurtain	TX	3		0.5%
Morris	TX	10		1.7%
Titus	TX	5		0.9%
Outside the Labor Shed		34		6.0%
Texarkana Region (Total)		585		100%

Economic Impacts

Part One - Economic Impact of Reduction of Worker Earnings in the Texarkana Labor Shed

The economic impacts in the Texarkana Labor Shed associated with the loss of the laid off workers' wage earnings can be estimated using the appropriate RIMS II multipliers. This study assumes the workers will seek jobs elsewhere and relocate.⁵

Reduced Wage Earnings of Workers. Local Lodge 1243 provided wage rates for a typical worker at RRAD. Table 2 shows the calculation of the wages per average worker and an estimate of the anticipated loss of wage earnings in the labor shed. A typical worker at RRAD works 2,080 hours

⁵ Note that this methodology tends to overestimate the total economic impact of the layoff if laid off workers find another job in the area, draw down savings, or borrow funds to maintain their expenditure levels. However, because the loss of the entire household income is not calculated, if most workers and their households do relocate, the estimates for earnings loss may be lower than the actual losses.

a year plus works 520 hours of overtime, earning an annual wage of \$66,924. Assuming this amount is the average wage earnings of a worker, the total annual loss of wage earnings in the labor shed resulting from the layoff is \$36.9 million.

Table 2		Loss of Wage Earnings in Texarkana Labor Shed		
Worker		Hours of Work	Wages per Hour	Wage Earnings
Annual		2080	\$23.40	\$48,672
Annual Overtime		520	\$35.10	\$18,252
Wages Per Average Worker				\$66,924
		Number of Workers in Labor Shed	Wage Earnings per Worker	Total Wage Earnings
Totals		551	\$66,924	\$36,875,124

Economic Impacts of Reduced Wage Earnings. The loss of wage earnings spills over into consumption expenditures that eventually have a multitude of effects on economic activities that reduce output, GDP,⁶ earnings, and the number of jobs in the labor shed.⁷ Table 3 summarizes the estimated impacts.

It is estimated that the loss of \$36.9 million in wage earnings would reduce economic activities (output) by approximately \$25.4 million in the Texarkana Labor Shed. In turn, this reduction contracts GDP by \$14.9 million and reduces earnings further by \$7.9 million, resulting in additional job losses of 213 jobs. The loss of 213 jobs compares closely to the 223 induced job losses found in Table 4. They are both estimates of the job losses resulting from reduced earnings for the supply chain workers that indirectly support activities at RRAD.

Table 3		Economic Impacts of Reduced Wage Earnings	
Impact Type		Total Effect	
Output Loss		\$25,366,398	
GDP Loss		\$14,849,612	
Earnings Loss		\$7,942,902	
Jobs Lost			
Direct		551	
Additional		213	
Total Jobs Lost		764	

⁶ GDP is the total value of finished goods and services produced and provided by an economy in a given year.

⁷ Due to the methodology developed to compute the RIMS II multipliers by the BEA, adjustments for taxes paid and savings of workers need not be made since they are incorporated into the multipliers (RIMS II, *An Essential Tool for Regional Developers and Planners*, Bureau of Economic Analysis, page 2.9, December 2013, www.bea.gov).

Part Two - Economic Impact of Reduced Business Activities

Laying off 585 workers at RRAD will reduce production at RRAD, lowering expenditures and purchases at RRAD because of the foregone production. In turn, the reduced purchases by RRAD spread throughout its supply chain, setting off multiple rounds of reduced purchases across many other businesses and their supply chains. The result is multiple reductions in economic activities and jobs.

Effects on Total Employment. Table 4 summarizes the total job impact from the layoff for the Texarkana Labor Shed and the Region.

Direct Job Impact. The direct job impacts are the 585 jobs lost in the region. Of these jobs, 551 jobs are in the Texarkana Labor Shed, with an additional 34 jobs lost in the larger region.

Indirect Job Impact. The resulting reduction of interindustry purchases in the supporting supply chains account for indirect job losses of 179 in the region (168 job losses in the labor shed and 11 jobs lost in the larger region).

Induced Job Impact. The loss of purchasing power of the laid off workers induces further job losses as their consumption expenditures decline. The resulting induced job loss in the region totals 237 jobs (223 jobs are in the labor shed and 14 jobs in the larger region).

Overall, job losses total 1001 jobs in the region, of which 943 are in the labor shed and 58 jobs are in the larger region.

Table 4	Job Losses Resulting from RRAD Layoffs		
	Type of Job Loss	Region	Labor Shed
Direct	585	551	34
Indirect	179	168	11
Induced	237	223	14
Total	1001	943	58

Loss of Economic Activity. Table 5 summarizes the total value of the losses of economic activity, GDP, household earnings, and jobs expected to occur because of the layoff at RRAD. The totals incorporate the direct, indirect, and induced effects of the layoffs.

Loss to Output. The levels of economic activities are expected to fall by \$255 million in the region, \$240 million in the labor shed, and \$15 million in the larger Texarkana region.

Loss to GDP. The total regional impact is a reduction of GDP of approximately \$161 million. Within the labor shed, the loss of 551 jobs at RRAD reduces its GDP by an estimated \$152 million. The reduction in GDP for the counties in the larger region is estimated to be \$9 million.

Loss to Household Earnings. RIMS II defines earning as employee compensation plus net earnings of sole proprietors and partnerships. It excludes personal contributions to social insurances programs, and pension plans.⁸ Household earnings are anticipated to fall by \$85 million in the region, including \$80 million in the labor shed and \$5 million in the larger region.

Table 5			
Reduction in Output, GDP, Household Earnings, and Jobs Due to Layoffs at RRAD			
Economic Indicators	Region	Labor Shed	Outside the Labor Shed
Output (Economic Activities)	\$255,145,166	\$240,361,530	\$14,783,636
GDP	\$161,175,202	\$151,836,379	\$9,338,823
Earnings of Households	\$85,397,087	\$80,449,004	\$4,948,083
Jobs	1,001	943	58

Conclusion

The permanent loss of 585 jobs at RRAD has a significant impact on the size of Texarkana’s manufacturing sector. The loss of relatively high paying jobs reduces RRAD’s workers’ economic contributions to the economic growth and development of their community.⁹

The Texarkana MSA will survive the economic effects of the layoff. However, the layoffs and their consequences alter its current economic path. The layoffs accelerate declines in a manufacturing sector that is already declining. Manufacturing jobs have declined by 1,643 workers since 2001. In comparison, the total number of jobs in Texarkana, MSA has grown by 5,755 jobs over the same period. The layoffs at RRAD act as a drag on the Texarkana’s economic momentum, and they intensify the consequences of the ongoing restructuring of its industrial sectors.

⁸ RIMS II, *An Essential Tool for Regional Developers and Planners*, Bureau of Economic Analysis, page G-1, December 2013, www.bea.gov.

⁹ RRAD jobs are relatively high paying jobs paying an estimated annual wage income of \$66,924. Comparatively, Texarkana’s median household income in 2016 was \$41,210, and for households of married-couples with families the median income was \$65,834. (Source: U.S. Census, 2012-2016 American Community Survey 5-Year Estimates)

Methodology

RIMS II (Regional Input-Output Modeling System) developed by the Bureau of Economic Analysis is a tool providing users a means to assess the potential economic impacts of various economic events. The model produces input-output multipliers that estimate a variety of impacts including output, employment, and earning effects.¹⁰ The event in this study is the layoff of workers at RRAD and accompanying economic impacts on the Texarkana Region. The RIMS II modeling process requires a researcher to define a study area to estimate the multipliers.¹¹ For this study, researchers defined the study area as the previously discussed Texarkana Labor Shed. The RIMS II multipliers are calculated using a combined region of counties in the Texarkana Labor Shed.

This analysis used a two-part approach to derive estimates of the total effects of the layoffs. In so doing, the direct effects of the layoffs are separated into two parts.¹² The first approach focuses on the impact of the layoff on the Texarkana Labor Shed. It explores the economic impacts of the reduced earnings of the laid off workers. If these earnings reductions are permanent, the analysis estimates the overall impacts of reduced workers earnings in the labor shed. The second approach estimates the total economic impacts associated with the decline in production due to the layoff. A layoff of 585 workers not only reduces activities at RRAD but also in other businesses in the community and surrounding region. This approach provides an overall estimate of the expected total impacts due to this layoff.

The RIMS II model does not include an industry that explicitly represents the work performed at RRAD. After some deliberation, researchers choose the fabricated metal product manufacturing industry as the best fit industry of those available in the RIMS II model of the Texarkana Labor Shed. Consequently, the activities of the fabricated metal product manufacturing industry are used to approximate activities at RRAD.

Input-Output methodology uses the term output to refer to the value of total sales or revenues. It is a measure of the value of the overall economic activity associated with producing gross domestic product (GDP). It is not a measure of GDP because there is double counting of products sold and resold between producers before final delivery to the consumer

RIMS II multipliers estimate total impacts on earnings, employment, and value added. Also, the RIMS II multipliers enable the total change in local output (sales) to be computed from RRAD reduced production (output). By using these different approaches, it was possible to estimate the various impacts of the layoff at RRAD.

¹⁰ *RIMS II, An Essential Tool for Regional Developers and Planners*, Bureau of Economic Analysis, U.S. Department of Commerce, December 2013, www.bea.gov

¹¹ Multipliers account for the economic changes associated with final-demand changes due to the economic event.

¹² The direct effects in this case are the immediate changes in final demands that are a consequence of the layoffs.