The National Grocers Association
Economic Impact Study
Sales Impact Analysis
And
SNAP Impact Study

Methodology and Documentation

Prepared for

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Economic Impact Study and Sales Impact Analysis

Executive Summary:

The National Grocers Association Economic Impact Study estimates the economic contributions made by the independent retail and wholesale grocery industry to the U.S. economy in 2020. John Dunham & Associates (JDA) conducted this research, which was funded by the National Grocers Association (NGA). This work used standard econometric models first developed by the U.S. Forest Service, and now maintained by IMPLAN Inc. Data came from industry sources, TDLinx, the U.S. Department of Agriculture, and Data Axle. In addition to this, JDA has produced an analysis of sales made in America by Independent Grocery Retailers and has tied those sales back to the domestic production of the goods and services sold at retail. Finally, an impact of SNAP was conducted, and estimates jobs, wages and economic output generated by all grocer's (both independent and chain) that participate in the program.

The study defines the independent retail and wholesale grocery industry as privately-owned grocery stores classified by the USDA as large grocers, supermarkets, or superstores; and the wholesale grocers that supply them. At the minimum, retail stores had to be classified by the USDA as offering a wide selection of four staple categories: Meat, poultry or fish; bread or cereal; vegetables or fruits; and dairy products. The study measures the number of jobs, the wages paid to employees, and the total economic output of this industry. Only retailers with an estimated $2 million to $5 billion in annual sales were included in this analysis.[1]

A retail industry is linked to other industries when it buys the necessary infrastructure to sell products.[2] Each industry in turn makes purchases from a different mix of other industries, and so on. Employees in all industries extend the economic impact when they spend their earnings. Thus, economic activity started by the independent grocery industry generates output (and jobs) in hundreds of other industries, often in states far removed from the original economic activity.

The indirect impact and induced impact are calculated using an input-output model of the United States called IMPLAN, developed by IMPLAN. The indirect impact is calculated as the supplier firms that provide infrastructure (e.g. checkout counters or construction) or services (e.g. insurance or accounting) to the industry. The induced impact is calculated as the re-spending by the employees of the industry and the indirect firms. The study calculates the impact on a national basis as well as on a state, congressional district, state house district, and state senate district basis.

The study also estimates taxes paid by the industry and its employees. Federal taxes include industry-specific excise and sales taxes, business and personal income taxes, FICA, and unemployment insurance. State and local tax systems vary widely. Direct retail taxes include state and local sales taxes, license fees, and applicable gross receipt taxes.[3] Independent grocers pay real estate and personal property taxes, business income taxes, and other business levies that vary in each state and municipality. All entities engaged in business activity generated by the industry pay similar taxes.

The independent grocery industry is a dynamic part of the U.S. economy, accounting for about $255.07

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[1]   Except for 5 companies included in the prior study.

[2]   Note that this does not include the products themselves. For example, the shelves, refrigeration units or cash registers purchased by a supermarket are part of the supplier impact. Canned goods, bread, frozen foods, etc. that are sold to consumers at retail are not part of the calculated impact. A separate calculation estimating retail sales and jobs associated with them was also conducted and should be considered as separate to the industry economic impact analysis.

[3]   It should be noted that these are not sales taxes simply collected from customers and passed through to state or local authorities, but rather taxes actually paid by retailers, their suppliers and their employees.

billion in output equivalent to nearly 1.16 percent of GDP.[4] The industry directly or indirectly employed nearly 2.01 million Americans in 2020. These workers earned $92.57 billion in wages and benefits. Members of the industry and their employees paid $36.11 billion in direct federal, state and local taxes.

Summary Results:

The NGA Economic Impact Study measures the impact of the independent retail and wholesale grocery industry – defined as privately-owned grocery stores classified by the USDA as large grocers, supermarkets, or superstores; and the wholesale grocers that supply them. At the minimum, retail stores had to be classified by the USDA as offering a wide selection of four staple categories: meat, poultry or fish; bread or cereal; vegetables or fruits; and dairy products. Only retailers with an estimated $2 million to $5 billion in sales were included in the analysis.[5]

The study measures the number of jobs, the wages paid to employees, and the total economic output of this industry, and shows that independent grocery retailers contribute about $255.07 billion in output or nearly 1.18 percent of GDP to the US economy and – through its production and distribution linkages – impacts firms in 534 distinct economic sectors.[6]

Independent retail and wholesale grocers alone, directly contribute about $96.43 billion in output, employ 1.15 million workers, and pay $41.80 billion in wages.

The impact of the industry includes the indirect impact of firms related to independent and retail grocers as suppliers of goods and services necessary to the operation of the industry. These firms produce and sell a broad range of items including checkout counters, grocery carts, shelving units, and employee uniforms. In addition, supplier firms provide a broad range of services, including personnel services, financial services, advertising services and consulting services. Finally, a number of people are employed in government enterprises responsible for the regulation of the independent grocery industry. All told, we estimate that the industry is indirectly responsible for 334,371 jobs with supplier firms generating over $64.54 billion in economic activity.

The induced impact of the industry takes additional employee re-spending linkages into account. While it is inappropriate to claim that suppliers to the indirect firms are part of the industry being analyzed,[7] the spending by employees of the industry, and those of supplier firms whose jobs are directly dependent on the independent grocery industry, should be included. This spending on everything from housing, to food, to educational services and medical care, makes up what is traditionally called the induced impact or multiplier effect of the industry. In other words, this spending and the jobs it creates are induced by the services provided by the independent grocery industry. We estimate that the induced impact of the industry generates nearly $94.09 billion in output and 523,417 jobs, resulting in a multiplier of about 0.98.[8]

The contribution of the industry to the public finances of the community constitutes an important part of the impact analysis. In the case of the independent grocery industry this contribution consists of the direct taxes paid by the firms as well as those paid by their employees. This equals a total of $36.11 billion in revenues to the federal, state and local governments.

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[4]   Based on GDP of $22,061.025.trillion See: Gross Domestic Product, 1st Quarter 2021 (Second Estimate); Corporate Profits, 1st Quarter 2021 (Preliminary Estimate), US Department of Commerce, Bureau of Economic Analysis, May 27, 2021.

[5]   With the exception of any NGA member companies that exceeded this parameter.

[6]   Economic sectors are based on IMPLAN sectors.

[7]   These firms would more appropriately be considered as part of the supplier firms' industries.

[8]   Often economic impact studies present results with very large multipliers – as high as 5. These studies invariably include the firms supplying the supplier industries as part of the induced impact. John Dunham & Associates believes that this is not an appropriate definition of the induced impact and as such limits this calculation to only the effect of spending by direct and supplier employees.

In addition to generating substantial economic activity, it is estimated that independent grocery retailers sell approximately $253.61 billion worth of products to consumers. Table 1 below presents a summary of the total economic impact of the industry in the United States.

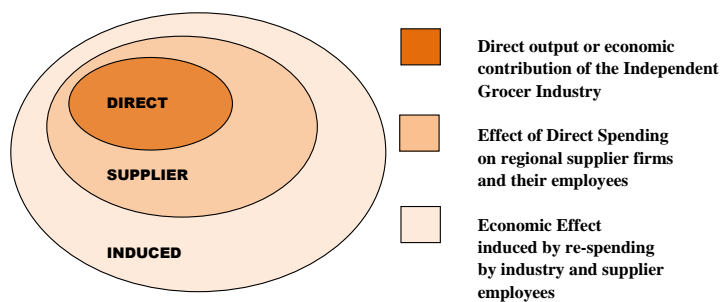**Table 1: Economic Contribution of the Independent Grocery Industry**

	Jobs	Wages	Economic Impact
Direct Impacts			
Retail Grocery Stores	1,105,303	$38,545,174,500	$87,550,987,000
Wholesalers	44,180	$3,253,770,500	$8,881,020,500
Total Direct Impact	1,149,483	$41,798,945,000	$96,432,007,500
Indirect Impacts	334,371	$21,120,707,400	$64,544,405,400
Induced Impacts	523,417	$29,655,133,300	$94,089,757,000
Total Impacts	2,007,271	$92,574,785,700	$255,066,169,900
Total Sales			$253,611,395,600
Total Taxes			$36,110,569,600

Output Model:

JDA produced the economic impact study for the NGA. The analysis consists of a number of parts, each of which will be described in the following sections of this document. These include data, models, calculations and outputs. These components were linked together into an interactive system that allows NGA to examine the links between the various parts of the industry and to produce detailed output documents on an as-needed basis. As such, there is no book – no thick report – outlining the impact of the industry, but rather a system of models and equations that can be continuously queried and updated.

Economic Impact Modeling – Summary:

The economic impact study begins with an accounting of the direct employment in the independent grocery sector, including both retail and wholesale grocers. The data come from industry sources, TDLinx, the U.S. Department of Agriculture, and Data Axle.

Direct output or economic contribution of the Independent Grocer Industry

Effect of Direct Spending on regional supplier firms and their employees

Economic Effect induced by re-spending by industry and supplier employees

It is sometimes mistakenly thought that initial spending accounts for all of the impact of an economic activity or a product. For example, it may appear that consumer expenditures for a product are the sum total of the impact on the local economy. However, one economic activity always leads to a ripple effect whereby other sectors and industries benefit from initial consumer spending in an industry. This inter-industry effect of an economic activity can be assessed using multipliers from regional input-output modeling.

The economic activities of events are linked to other industries in the state and national economies. The activities required by independent grocers to sell products generate a direct effect on the economy. Indirect (or regional) impacts occur when these activities require purchases of goods and services from local or

regional suppliers - including construction services, checkout counters, shelving units, utilities, consulting services, accounting services, et cetera.[9] Additional induced impacts occur when workers involved in direct and indirect activities spend their wages. The ratio between induced economic and direct impact is termed the multiplier. The graphic above illustrates these linkages.

This method of analysis allows the impact of local production activities to be quantified in terms of final demand, earnings, and employment in the states and the nation as a whole.

Once the direct impact of the industry has been calculated, the input-output methodology discussed below is used to calculate the contribution of the supplier sector and of the re-spending in the economy by employees in the industry and its suppliers. This induced impact is the most controversial part of economic impact studies and is often quite inflated. In the case of the NGA model, only the most conservative estimate of the Induced Impact has been used.

Economic Impact Model Description and Data:

This analysis is based on data provided by NGA, TDLinx, the USDA, Data Axle, and the federal government. The analysis utilizes the IMPLAN model in order to quantify the economic impact of the independent grocery industry on the economy of the United States. The model adopts an accounting framework through which the relationships between different inputs and outputs across industries and sectors are computed. This model can show the impact of a given economic decision – such as the opening of a regional theater or operating a sports facility – on a pre-defined, geographic region. It is based on the national income accounts generated by the US Department of Commerce, Bureau of Economic Analysis (BEA).[10]

Every economic impact analysis begins with a description of the industry being examined. In the case of the NGA model, the independent retail and wholesale grocery industry is defined as privately-owned grocery stores classified by the USDA as large grocers, supermarkets, or superstores; and the wholesale grocers that supply them. At the minimum, retail stores had to be classified by the USDA as offering a wide selection of four staple categories: Meat, poultry or fish; bread or cereal; vegetables or fruits; and dairy products. The retailers included in this model include large privately held corporations, family-owned businesses, employee-owned businesses, cooperatives, and more. Excluded from this study are small food sellers that generate less than $2 million in annual sales, large retailers that total more than $5 billion in sales[11], and all publicly held grocery retailers and chains.

The IMPLAN model is designed to run based on the input of specific direct economic factors. It uses a detailed methodology (see IMPLAN Methodology section) to generate estimates of the other direct impacts, tax impacts and supplier and induced impacts based on these entries. In the case of the NGA Economic Impact Model, the direct employment in the independent retail and wholesale grocery is a base starting point for the analysis. This data is gathered at the facility level; therefore, a company with many different locations might have 100 employees at one location and 50 at another location. Direct job numbers for independent retail and wholesale grocers were derived from the physical employment location as reported to TDLinx or Data Axle. Data Axle data is recognized nationally as a premier source of micro industry data. Their database contains information on over 15 million businesses in the United States.[12] It is used

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[9] Note that this does not include the products themselves.
[10] RIMS II is a product developed by the U.S. Department of Commerce, Bureau of Economic Analysis as a policy and economic decision analysis tool. IMPLAN was originally developed by the US Forest Service, the Federal Emergency Management Agency and the Bureau of Land Management. It was converted to a user-friendly model by the Minnesota IMPLAN Group in 1993.
[11] With the exception of several member companies.
[12] Data Axle is the leading provider of business and consumer data for the top search engines and leading in-car navigation systems in North America. Data Axle gathers data from a variety of sources, by sourcing, refining, matching, appending, filtering, and delivering the best quality data. Data Axle verifies its data at the rate of almost 100,000 phone calls per day to ensure absolute accuracy.

extensively for credit reporting, and according to the vendor, encompasses about 98 percent of all business enterprises in the country. This data is gathered at the facility level; therefore, a company with a manufacturing plant, warehouse and sales office would have three facilities, each with separate employment counts. Since the data came from multiple sources and had to be pieced together, staff from JDA scanned the data for discrepancies.

Once the initial direct employment figures were established, they were entered into a model linked to the IMPLAN database. The IMPLAN data are used to generate estimates of direct wages and output. Wages are derived from data from the U.S. Department of Labor's ES-202 reports that are used by IMPLAN to provide annual average wage and salary establishment counts, employment counts and payrolls at the county level. Since this data only covers payroll employees, it is modified to add information on independent workers, agricultural employees, construction workers, and certain government employees. Data are then adjusted to account for counties where non-disclosure rules apply. Wage data include not only cash wages, but health and life insurance payments, retirement payments and other non-cash compensation. It includes all income paid to workers by employers.

Total output is the value of production by industry in a given state. It is estimated by IMPLAN from sources similar to those used by the BEA in its RIMS II series. Where no Census or government surveys are available, IMPLAN uses models such as the Bureau of Labor Statistics Growth model to estimate the missing output.

The model also includes information on income received by the Federal, state and local governments, and produces estimates for the following taxes at the Federal level: corporate income, payroll, personal income, estate and gift taxes; as well as excise taxes, customs, duties, fines and fees et cetera. State and local tax revenues include estimates of: Corporate profits, property, sales, severance, estate and gift, and personal income taxes; as well as licenses fees, specific payroll taxes, et cetera.

While IMPLAN is used to calculate the state level impacts, Data Axle data provides the basis for congressional district level estimates. Publicly available data at the county and congressional district level is limited by disclosure restrictions, especially for smaller sectors of the economy like can manufacturing. The model therefore uses actual physical location data provided by Data Axle in order to allocate jobs – and the resulting economic activity – by physical address or when that is not available, zip code. For zips entirely contained in a single congressional district, jobs are allocated based on the percentage of total sector jobs in each zip. For zips that are broken by congressional districts, allocations are based on the percentage of total jobs physically located in each segment of the zip. Physical locations are based on either the actual address of the facility or the zip code of the facility, with facilities placed randomly throughout the zip code area. All supplier and indirect jobs are allocated based on the percentage of a state's employment in that sector in each of the districts. Again, these percentages are based on Data Axle data. As with the direct job allocation model, direct independent retail and wholesale grocery jobs are based on the physical location as reported to Data Axle.

Sales Impact Model Description and Data:

While the economic impact analysis of the independent grocery industry calculates the jobs, wages, taxes and economic activity generated by the activity of selling grocery products at retail, it does not necessarily calculate the upstream economic benefits resulting from the production of the goods and services actually sold by independent grocers.

This model calculates these effects at the producer level throughout the United States of the total retail sales at the 21,574 independent grocery stores for each of the major categories of product sold.[13] All told, the estimated production value of products sold in 2020 was $253.61 billion.

This model is based on data collected by the US Department of Commerce, Bureau of the Census. Every five years, the Census Bureau produces its Economic Census which provides details on the product line sales for different types of retail establishments in the different states. This model utilizes the 2017 Retail Census which just came out in 2020.[14] From this, total sales for 17 different product line categories by store type was extracted. These state totals were divided by the number of jobs in each retail category (supermarkets, specialty food markets, and warehouse/supercenter stores), to come up with a sales per employee figure for each store type and state. These figures were then applied to the store level data used in the economic impact analysis. Calculations were done at the zip code level as well to facilitate breaking the sales by legislative districts and other geographies.

SNAP Impact Model Description and Data:

The SNAP (Supplemental Nutrition Assistance Program) Impact Model works much the same as the sales model described above. It measures the amount of sales at grocery stores that participate in the program. Unlike the sales model, which includes all sales at all independent grocery stores, the SNAP model includes only the sales of preapproved SNAP grocery items. For example, alcohol and tobacco products cannot be purchased with SNAP, and are therefore removed from this analysis. Also, the SNAP model includes all retailers authorized to select SNAP payments, not just independent grocers. In total, SNAP sales come to $44.9 billion across the US.[15] A study conducted in 2016 shows the breakdown of SNAP sales by product type.[16] The resulting outputs from the sales model were adjusted to conform to these weights. Once the weighted sales were calculated they were multiplied by the percentage of the population receiving SNAP in each zip code.

Calculated sales data by state were run through IMPLAN's input/output model to determine jobs, wages and output. Ultimately, SNAP sales directly generate 198,800 FTE jobs, $6.7 billion in wages and $15.4 billion in economic output.

When districting these sales, it's important to note that not all SNAP sales are happening in grocery stores equally across the country. Data on the number of households receiving SNAP benefits by zip code comes from Census data included in Caliper Corporation's Maptitude geographic files.[17] Based on where these households are located in each state, JDA distributed the SNAP sales data using the percent of households within 15 miles of each store. This data is then run through the districting model to determine jobs, wages, and output for congressional and legislative districts.

IMPLAN Methodology:[18]

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[13]   Wholesale locations are not included.

[14]   *2017 Economic Census, Retail Trade: All Sectors: Industry by Products for the U.S. and States: 2017*, April 14, 2021, US Department of Commerce, Bureau of the Census, at: https://www.census.gov/data/tables/2017/econ/economic-census/naics-sector-44-45.html

[15]   This is slightly lower than reported by the USDA for 2019 since it does not include Puerto Rico, the Virgin Islands or other US territories, and represents actual purchases made during the period not benefits paid, some of which likely were not used during the year, or were used for purposes not related to retail sales at food stores.

[16]   Garasky, Steven, et.al., *Foods Typically Purchased by SNAP Households*, prepared by IMPAQ International, LLC for USDA, Food and Nutrition Service, November 2016, at: https://www.fns.usda.gov/snap/foods-typically-purchased-supplemental-nutrition-assistance-program-snap-households

[17]   Maptitude is a GIS Software published by the Caliper Corporation. Online at: https://www.caliper.com/maptovu.htm

[18]   This section is paraphrased from IMPLAN Professional: Users Guide, Analysis Guide, Data Guide, Version 2.0, MIG, Inc., June 2000.

Francoise Quesnay, one of the fathers of modern economics, first developed the analytical concept of inter-industry relationships in 1758. The concept was actualized into input-output analysis by Wassily Leontief during the Second World War, an accomplishment for which he received the 1973 Nobel Prize in Economics.

Input-Output analysis is an econometric technique used to examine the relationships within an economy.

It captures all monetary market transactions for consumption in a given period and for a specific geography. The IMPLAN model uses data from many different sources – as published government data series, unpublished data, sets of relationships, ratios, or as estimates. IMPLAN gathers this data, converts it into a consistent format, and estimates the missing components.

There are three different levels of data generally available in the United States: federal, state and county. Most of the detailed data is available at the county level, and as such there are many issues with disclosure, especially in the case of smaller industries. IMPLAN overcomes these disclosure problems by combining a large number of datasets and by estimating those variables that are not found from any of them. The data is then converted into national input-output matrices (Use, Make, By-products, Absorption and Market Shares) as well as national tables for deflators, regional purchase coefficients and margins.

The IMPLAN Make matrix represents the production of commodities by industry. The Bureau of Economic Analysis (BEA) Benchmark I/O Study of the US Make Table forms the bases of the IMPLAN model. The Benchmark Make Table is updated to current year prices, and rearranged into the IMPLAN sector format. The IMPLAN Use matrix is based on estimates of final demand, value-added by sector and total industry and commodity output data as provided by government statistics or estimated by IMPLAN. The BEA Benchmark Use Table is then bridged to the IMPLAN sectors. Once the re-sectoring is complete, the Use Tables can be updated based on the other data and model calculations of interstate and international trade.

In the IMPLAN model, as with any input-output framework, all expenditures are in terms of producer prices. This allocates all expenditures to the industries that produce goods and services. As a result, all data not received in producer prices is converted using margins which are derived from the BEA Input-Output model. Margins represent the difference between producer and consumer prices. As such, the margins for any good add to one. If, for example, 10 percent of the value added by a retailer is from the purchase of maintenance services, then the maintenance service margin would be 0.1.

Deflators, which account for relative price changes during different time periods, are derived from the Bureau of Labor Statistics (BLS) Growth Model. The 224 sector BLS model is mapped to the 544 sectors of the IMPLAN model. Where data are missing, deflators from BEA's Survey of Current Businesses are used.

Finally, one of the most important parts of the IMPLAN model, the Regional Purchase Coefficients

(RPCs) must be derived. IMPLAN is derived from a national model, which represents the "average" condition for a particular industry. Since national production functions do not necessarily represent particular regional differences, adjustments need to be made. Regional trade flows are estimated based on the Multi-Regional Input-Output Accounts, a cross-sectional database with consistent cross interstate trade flows developed in 1977. These data are updated and bridged to the 544 sector IMPLAN model.

Once the databases and matrices are created, they go through an extensive validation process. IMPLAN builds separate state and county models and evaluates them, checking to ensure that no ratios are outside of recognized bounds. The final datasets and matrices are not released before extensive testing takes place.