The Economic Impact of Airbnb on New Orleans

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Executive Summary

We estimate the total economic impact of Airbnb on the New Orleans economy for 2015. Total economic impact is the sum of **(1)** the "direct effect" of spending on rent, food and beverages, transportation, and the like, **(2)** the "indirect effect," where sectors which form the supply chain of these industries increase their purchase to fill this demand, and **(3)** the "induced effect," where local incomes are spent and respent locally.

For 2015, we estimate that Airbnb had the following impact on the New Orleans economy:

- The total value added to the New Orleans economy via Airbnb was **$185 million dollars**.
- Output attributable to Airbnb in New Orleans is **$316 million dollars**.
- Airbnb had a total economic impact of **$134 million dollars** in increased income in New Orleans.
- Airbnb's visitors accounted for **4,480 additional jobs** in 2015, with many of these jobs in the service sector.
- **286,619** people stayed in New Orleans in 2015 via Airbnb. They stayed on average **3.3 nights**.

Table 1: Economic Impact Summary

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	3,656	$92,016,570	$112,700,800	$197,434,744
Indirect Effect	393	22,408,432	38,176,251	61,723,524
Induced Effect	430	19,422,534	34,613,390	57,010,048
Total Effect	4,480	133,847,536	185,490,441	316,168,316

What is Airbnb?

Airbnb is part of the "sharing economy." Airbnb (originally AirBedandBreakfast.com) is an online service which matches hosts with extra space to rent, with travelers looking for a place to stay. Airbnb hosts can rent out a single room, multiple rooms, or their whole house.

How Airbnb works:[1]

1. Hosts post a property description and price on Airbnb.
2. Travelers search for a property that meets their needs (location, price, amenities, etc.)
3. A booking is made through Airbnb.
4. The host approves the booking.
5. After the guests stay, Airbnb transfers funds to the host after deducting their commission.

Currently, Airbnb reaches six million guests in more than 34 thousand cities in 191 countries around the world. There are more than two million listings on Airbnb worldwide.

Host Income

September 2015 - September 2016

- There are **5,309** different Airbnb hosts within the New Orleans metro area.
- Airbnb hosts earned an average of **$10,080**.
- Airbnb hosts rented their properties, on average, **63.8** nights a year.
- About **47%** of New Orleans area Airbnb hosts rented their properties for fewer than **30** nights a year.

Figure 1: Number of Listings by Zip Code

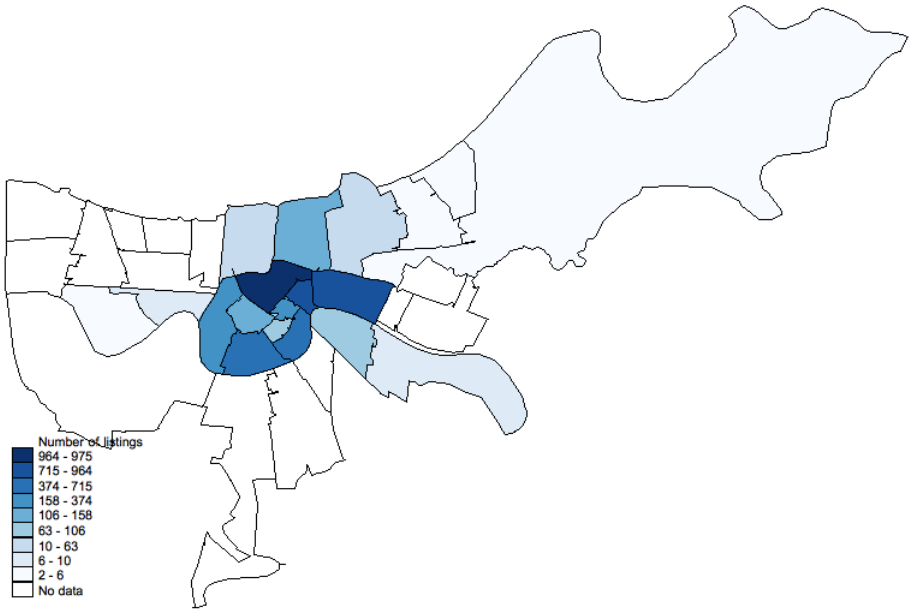
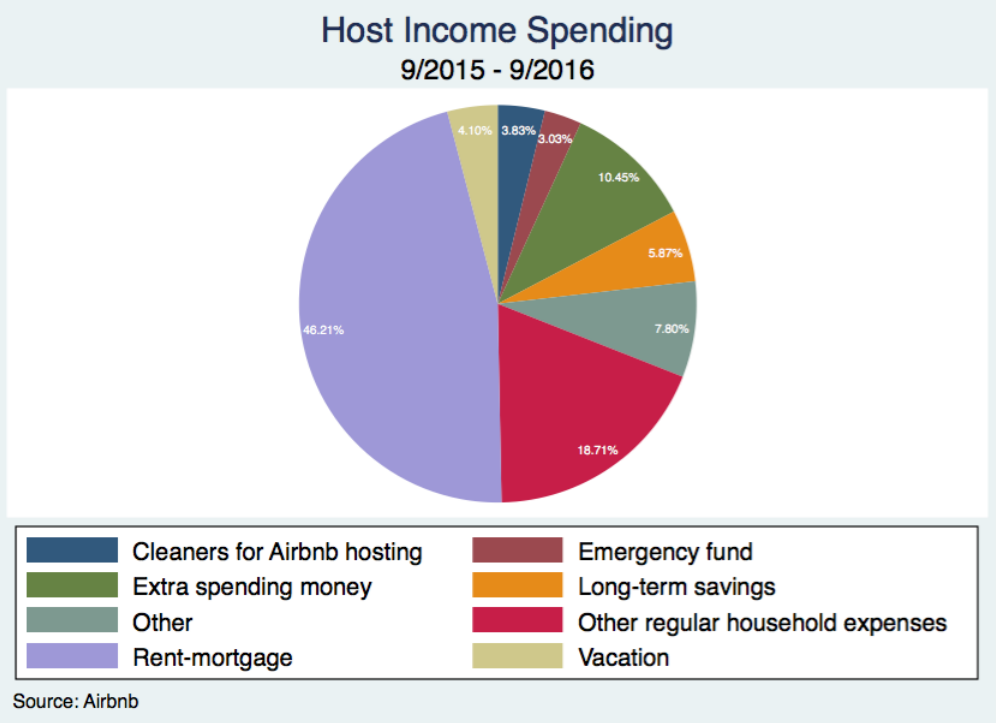


Table 2: Host Income Spending

Category	Amount	
Rent-mortgage	24,949,206	46.21%
Other regular household expenses	10,100,942	18.71%
Extra spending money	5,644,644	10.45%
Other	4,213,778	7.80%
Long-term savings	3,170,186	5.87%
Vacation	2,212,992	4.10%
Cleaners for Airbnb hosting	2,067,480	3.83%
Emergency fund	1,637,008	3.03%



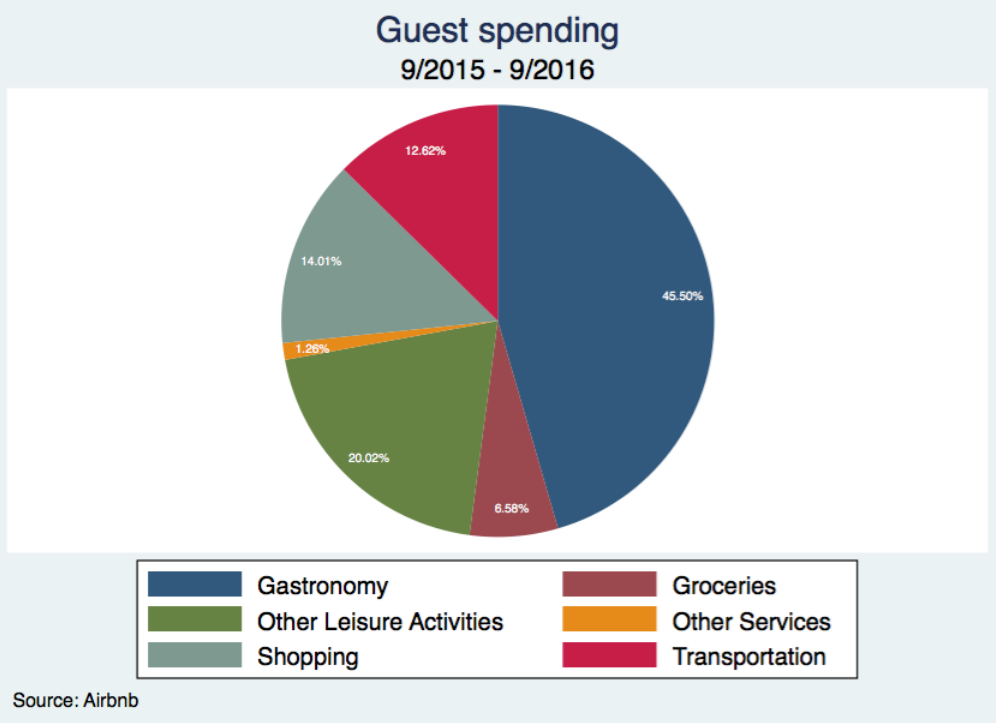
Guest Spending

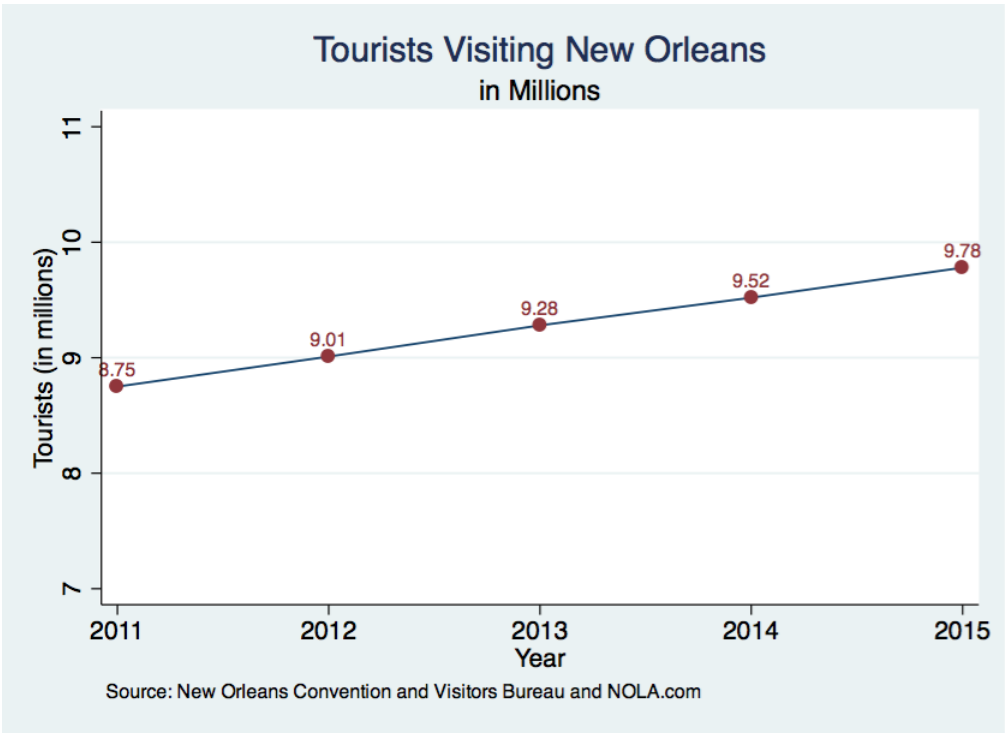
September 2015 - September 2016

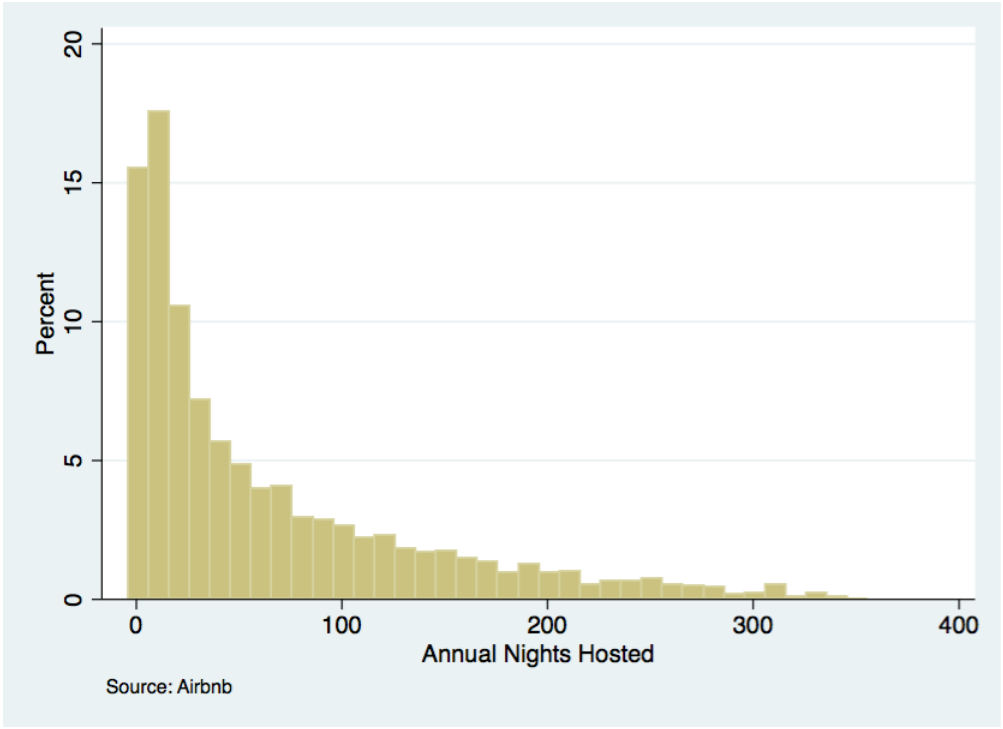
- Airbnb guests spent a total of **$169,017,209** in New Orleans.
- A total of **286,619** guests used Airbnb in New Orleans.
- A total of **338,585** nights were booked using Airbnb.

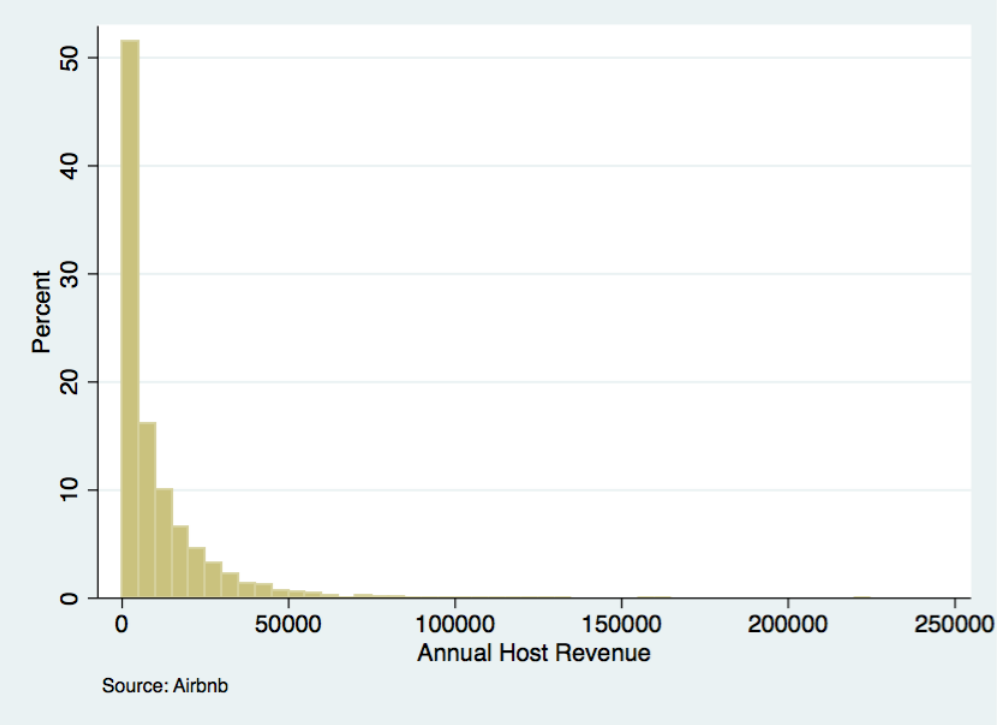
Table 3: Guest spending

Category	Amount		Per guest
Gastronomy	76,910,520	45.50%	268.34
Other Leisure Activities	33,840,628	20.02%	118.07
Shopping	23,681,678	14.01%	82.62
Transportation	21,332,106	12.62%	74.43
Groceries	11,122,445	6.58%	38.81
Other Services	2,129,830	1.26%	7.43




Tourists Visiting New Orleans
in Millions
Tourists (in millions)
7
8
9
10
11
8.75
9.01
9.28
9.52
9.78
2011
2012
2013
2014
2015
Year
Source: New Orleans Convention and Visitors Bureau and NOLA.com


Percent
0
5
10
15
20
0
100
200
300
400
Annual Nights Hosted
Source: Airbnb


Percent
0
10
20
30
40
50
0
50000
100000
150000
200000
250000
Annual Host Revenue
Source: Airbnb

Economic Impact

An economic impact analysis estimates how spending in one area of the economy impacts the other areas. If a tourist visits New Orleans, they may spend $1000 dollars on food and lodging. These dollars become income for waiters and landlords, for example, who spend some of their money locally on clothing, and additional food and lodging. The challenge for the economist is tracing the ripple effects of such spending as it circulates through the local economy. We explain how we estimate those effects below.

When income is spent it becomes income for other people, many of them locals. The locals, in turn, spend a portion of their money locally, proving additional income for more locals. Similarly, when a business makes a product, it must purchase materials from another business, and so forth.[2] The process is one of a circular flow of income. Income leaks from the system whenever it is spent outside of the region. The task of the economist is to estimate how spending in one sector of the economy spills over into other interconnected sectors.

To examine the interconnections within the local economy, we use input/output (IO) tables. IO tables were invented by economist Wassily Leontieff, work for which he was awarded the 1973 Nobel Prize in Economics. An IO table shows how the various sectors provide inputs for, and demand outputs from, all of the other sectors in the economy. For example, a local restaurant might buy its seafood from a local fisherman, and its bread from a local bakery. The baker might buy milk from a local supermarket, and so forth. Detailed IO tables can be constructed at the National level, relying on rough national averages, or at the local level, providing more precise analysis. In our analysis, we use local IO tables.

To analyze the local economy's many interconnections in the IO tables, economists use specialized software. The software system that we use is IMPLAN (IMpact analysis for PLANning), arguably the industry standard for such analyses. IMPLAN's IO tables are constructed using the most recently available data from the Federal Government including the Bureau of Economic Analysis, the Bureau of Labor Statistics, the US Census Bureau, and the Department of Agriculture. IMPLAN has 528 sectors, of which 272 exist in New Orleans.

IMPLAN's IO tables provide the structure for analysis. To use an analogy from medicine, the IO tables describe how the organs are interconnected via veins and arteries. The stuff that flows through these channels would be like the income flowing between sectors. More specifically, the inputs into the model are the direct expenditures by visitors who stayed with Airbnb: the money they spent on rent, food, entertainment, travel, and other things. These data are fed, via IMPLAN, through

the model of interconnected sectors to arrive at an estimate of total economic impact.

The economist's task is to estimate Airbnb's effect on the total amount of economic activity (income, employment, and so forth) that flows through the New Orleans economy.

The total economic impact is the sum of three components: the Direct, Indirect, and Induced effects.

The "direct effect" of tourism spending is the dollar amount that tourists spent in New Orleans. That is, the additional amount of dollars that they spend, and that New Orleans would not have received without those visitors.

To provide food for the tourists, for example, local restaurants often purchase locally sourced food. That is, sectors that are linked in the supply-chain must be included in the impact analysis. This is the "indirect effect." The indirect effects are the income of all of those local industries that are linked to the tourism industry through the supply-chain. Ultimately, every industry is linked to every other industry. The challenge is to quantify the sum of all of these linkages, and arriving at an aggregate indirect effect. Imports from outside the region are not included in the economic impact report, as they represent income in other regions.

Each of the affected sectors must also pay for labor. The restaurant must pay for waiters; the farm must pay for agricultural workers. Waiters, for example, spend money for their own food, lodging, entertainment, family expenses, and so forth. The spending by these employees represents the induced effects that resulted, ultimately, from the increased tourism dollars. In other words, worker-spending is "induced" and supply-chain spending is "indirect."

"Employment" in this analysis, is equivalent to "jobs." It includes full and part-time jobs for wage and salary workers, as well as self-employed proprietors. It is not "full-time equivalents."

"Labor income" is equal to total wages and benefits plus income from sole proprietors. Thus, it is greater than "take home pay."

"Value added" is the sum of (a) employee compensation, (b) proprietor's income, (c) other property type income, (d) tax on production and imports.

According to the New Orleans Convention and Visitors Bureau and UNO, for the past five years, tourism counts in New Orleans have increased by approximately 260 thousand (or 2.8%) each year over the past half decade.[3] This number is almost exactly equal to the number of visitors that came to New Orleans via Airbnb.

Airbnb's Impact on Local Employment

According to data collected by the Bureau of Labor Statistics, approximately 87,900 people were employed in the "Leisure and hospitality" industry in New Orleans and Metairie.[4]

Visitors to New Orleans who stay at an Airbnb location spend money on rent, of course, but also all the other things tourists and visitors spend their money on: entertainment, food, transportation, souvenirs, etc. Each of these spending activities support local jobs directly, indirectly, and via induced effects.

Airbnb visitors account for a **3,656** jobs directly. Of these, 3,299 are service sector jobs; 239 are transportation jobs;[5] and 118 are from the trade sector. Jobs in these sectors create jobs in other sectors via the "indirect effect." These are primarily from the service sector (304 jobs), transportation (32), trade (30), and government (14).

The "induced effect" adds 430 jobs to the New Orleans economy, with most accruing to the service sector (an estimated 342 jobs), trade (63), transportation (15), government (4) and construction (4).

Adding these three employment channels together, we get the total employment in New Orleans originating from Airbnb: 4,479.5 jobs. The majority of these jobs (3,944.7) are service sector jobs.

Table 4: Employment

Description	Direct	Indirect	Induced	Total
Agriculture	0.00	0.45	0.09	0.53
Mining	0.00	0.92	0.10	1.02
Construction	0.00	10.58	3.81	14.40
Manufacturing	0.00	1.52	0.63	2.15
Transportation	239.38	32.62	15.30	287.30
Trade	118.03	29.73	63.62	211.38
Service	3,298.88	303.55	342.27	3,944.71
Government	0.00	13.76	4.21	17.97
Total	3,656.29	393.14	430.03	4,479.46

Airbnb's Impact on Labor Income

Spending by Airbnb visitors creates labor income. Total labor income attributable to Airbnb (including direct, indirect, and induced effects) amounts to **$134 million dollars**. Labor income in the service sector from Airbnb-induced activity is **$110 million dollars**. Workers in the transportation sector enjoy increases of **$13.3 million dollars** total. The trade sector earns **$7.8 million dollars** in labor income from Airbnb-induced economic activity.

These totals can be broken down into their direct, indirect, and induced effects, as detailed in Table (5). The biggest effect is the direct effect, amounting to **$92 million dollars** in income ($78.6 million to the service industry). The indirect and induce effects—what are often called the "spillover effects"—add another $22.4 and $19.4 million dollars to the direct effect, giving a total of $92.0 million dollars.

Table 5: Labor Income

Description	Direct	Indirect	Induced	Total
Agriculture	0	4,686	1,122	5,808
Mining	0	116,057	17,873	133,930
Construction	0	700,637	249,926	950,564
Manufacturing	0	87,801	37,814	125,616
Transportation	9,717,276	2,507,417	1,079,043	13,303,737
Trade	3,676,149	1,538,997	2,615,121	7,830,267
Service	78,623,145	16,250,839	15,097,279	109,971,263
Government	0	1,201,996	324,355	1,526,351
Total	92,016,570	22,408,432	19,422,534	133,847,536

Airbnb's Impact on Total Value Added

Total Value Added (TVA) is a measure of regional income. TVA is equal to total revenues minus the cost of inputs. TVA is also equal to the sum of four components **(1)** employee compensation, **(2)** proprietor's income, **(3)** other property type income, and **(4)** tax on production and imports.

The BEA defines "industry value added" as follows:

> "The value added of an industry, also referred to as gross domestic product (GDP)-by-industry, is the contribution of a private industry or government sector to overall GDP. The components of value added consist of compensation of employees, taxes on production and imports less subsidies, and gross operating surplus. Value added equals the difference between an industry's gross output (consisting of sales or receipts and other operating income, commodity taxes, and inventory change) and the cost of its intermediate inputs (including energy, raw materials, semi-finished goods, and services that are purchased from all sources)." (Bureau of Economic Analysis, 2016b)

Spending by Airbnb visitors adds **$185.5 million dollars** in income as measured by TVA: $112.7 million directly, $38.2 million indirectly, and $34.6 million via the induced effect. Of the $185.5 million dollar total, $149.9 million is created by the service sector, $19.2 million by transportation, and $13.4 million by trades.

Below, we show the direct, indirect, induced and total effects of Airbnb activity on these four components.

Table 6: Total Value Added

Description	Direct	Indirect	Induced	Total
Agriculture	0	8,902	1,382	10,284
Mining	0	392,247	83,007	475,254
Construction	0	845,495	300,674	1,146,168
Manufacturing	0	140,313	70,748	211,061
Transportation	13,482,010	3,852,416	1,902,583	19,237,009
Trade	6,394,120	2,733,077	4,358,280	13,485,478
Service	92,824,669	29,405,579	27,636,363	149,866,612
Government	0	798,222	260,354	1,058,576
Total	112,700,800	38,176,251	34,613,390	185,490,441

Airbnb's Impact on Local Output

The BEA defines "gross output" as follows:

> "Gross output is principally a measure of an industry's sales or receipts, which can include sales to final users in the economy (GDP) or sales to other industries (intermediate inputs). Gross output can also be measured as the sum of an industry's value added and intermediate inputs." (Bureau of Economic Analysis, 2016a)

Total output from Airbnb activity was equal to **$316.2 million dollars** in New Orleans.

Table 7: Output

Description	Direct	Indirect	Induced	Total
Agriculture	0	16,739	2,789	19,528
Mining	0	583,807	103,147	686,954
Construction	0	1,924,152	713,477	2,637,628
Manufacturing	0	449,163	272,684	721,847
Transportation	21,333,053	8,586,169	4,404,404	34,323,626
Trade	9,257,903	4,019,711	6,373,340	19,650,953
Service	166,843,788	44,195,116	44,255,023	255,293,928
Government	0	1,948,668	885,183	2,833,852
Total	197,434,744	61,723,524	57,010,048	316,168,316

Tax impact

Estimating the tax impact of Airbnb on state and federal taxes requires a somewhat manual approach. The industry software that we use for this study, IMPLAN, does not have an exact categorization for Airbnb or any other "sharing economy" accommodations. While Airbnb hosts do not receive wages, they do receive the IRS Form 1099 and must report the income earned on their state and federal tax returns.

Tables 8 and 9 show the tax impact created by Airbnb guests in New Orleans through their spending excluding their lodging with Airbnb hosts.

Table 8: State and Local Tax Impact

Description	Employee Compensation	Production and Imports	Households	Corporations
Dividends				16,702
Social Ins Tax	169,190			
Tax on Production and Imports:				
Sales Tax		6,367,515		
Property Tax		2,368,021		
Other		880,450		
Corporate Profits Tax				82,152
Personal Tax:				
Income Tax			944,588	
NonTaxes (Fines-Fees)			351,717	
Other			99,943	
Total State and Local Tax	169,190	9,615,987	1,396,248	98,854

Table 9: Federal Tax Impact

Description	Employee Compensation	Proprietor Income	Production and Imports	Households	Corporations
Social Ins Tax	9,720,740	377,610			
Tax on Production and Imports:					
Excise Taxes			902,948		
Custom Duty			335,124		
Fed NonTaxes			95,236		
Corporate Profits Tax					1,759,445
Personal Tax: Income Tax				5,318,766	
Total Federal Tax	9,720,740	377,610	1,333,308	5,318,766	1,759,445

The net tax impact for rent income for Airbnb hosts cannot be easily calculated. Hosts can deduct related expenses, reducing the taxable amount. Hosts' income levels can vary significantly which may not require them to pay any income tax.

Since Airbnb hosts received **$53,960,616** for the study period, income tax would be **$5,396,061.60** at 10% average income tax level. The income tax would be **$2,698,030.80** at 5% average income tax level.

Conclusion

We estimate the total economic impact of Airbnb on the New Orleans economy for 2015 at $134 million dollars; the total value added to the New Orleans economy via Airbnb at $185 million dollars; and the total output attributable to Airbnb in New Orleans at $316 million dollars.

It is estimated that 286,619 people stayed in New Orleans in 2015 via Airbnb, staying an average of 3.3 nights. Airbnb visitors spent an average of $778 dollars per visit. This activity has created a significant number of jobs and income in the area. We estimate that Airbnb visitors accounted for 4,480 jobs in 2015, with many of these jobs in the service sector.

Appendix: Sensitivity analysis

In the preceding analysis, we examined the total spillover effect in incomes, employment, and tax revenues, attributable to Airbnb. That is, we decomposed the effect of spending that actually occurred.

In what follows, we consider the net effect from Airbnb; that is, we consider what Airbnb's impact is, given that some of its clients might have visited New Orleans even if Airbnb had not been available. This new analysis would show what would happen to the New Orleans economy (income, employment and tax revenues) if Airbnb were to leave the area.

To investigate this question, we rely on estimates of price-sensitivity to changes in the price of rental prices and the cost of tourism. In economics jargon, we rely on the "price elasticity of demand" with respect to changes in price. This crucial bit of information has been investigated at length by academicians and practitioners alike. Some of these studies include Tussyadiah and Pesonen (2015), Konovalova and Vidishcheva (2013), Crouch (1994), and Albouy et al. (2014)

The question is "How many guests would have come to New Orleans if it wasn't for Airbnb". The literature on "price elasticity of demand" presents evidence ranging from -0.6 to -0.8 (ex. Crouch (1994); Albouy et al. (2014)). We have to note however that the price elasticity in hospitality is not clear cut. While revenue management is a concern, lower prices do not directly refer to higher occupancy rates. The demand, quality, services offered, occupancy rates (in and of itself) becomes endogenous to the price elasticity discussion. Literature on price elasticity that we found to be more relevant here is drawn from tourism in its more general interpretation and housing. It is not argued here that Airbnb was cheaper either. However elasticity shows the guests' preference for the venue in light of a change in overall variables. Price, within the elasticity discussion, also translates into cheaper/more expensive hotels, small/large rooms, differences in star designations etc.

In its current context, elasticity is merely a vehicle to present a case for the "guest demand elasticity."

The University of New Orleans, Hospitality Research Center study titled "Louisiana Tourism Forecast" prepared for "Louisiana Department of Culture, Recreation and Tourism" (UNO study) provides characteristics for average tourists that visit Louisiana in general and New Orleans in specific.[6] In what follows, we use this spending profile of the average tourist to New Orleans.

We also use the "most conservative" elasticity coefficient of -0.6, implying that almost half of Airbnb's guests would still come to New Orleans even if it weren't for Airbnb) the following economic impact table is prepared. We also use the average

tourist spending profile from the UNO study.

Table 10: Economic Impact for the Most Conservative Elasticity

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	1318	31,822,494	39,461,305	70,773,198
Indirect Effect	148	8,326,838	14,337,067	23,133,673
Induced Effect	151	6,813,372	12,142,331	19,999,034
Total Effect	1617	46,962,705	65,940,703	113,905,904

The economic impact figures presented in the Table 10 are compared to the actual economic impact of Airbnb for the New Orleans area as presented in earlier parts of this study. Table 11 shows the loss of economic impact if it wasn't for Airbnb, using the most conservative case.

Table 11: Lost Economic Impact

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	-2,338	-60,194,077	-73,239,495	-126,661,546
Indirect Effect	-245	-14,081,593	-23,839,184	-38,589,851
Induced Effect	-279	-12,609,161	-22,471,059	-37,011,014
Total Effect	-2,862	-86,884,831	-119,549,738	-202,262,412

References

Albouy, D., G. Ehrlich, and Y. Liu (2014). Housing demand and expenditures: How rising rent levels affect behavior and cost-of-living over space and time. Technical report, University of Illinois working paper.

Bureau of Economic Analysis (2016a, October 1). What is gross output by industry and how does it differ from gross domestic product by industry? *US Department of Commerce*.

Bureau of Economic Analysis (2016b, October 1). What is industry value added? *US Department of Commerce*.

Crouch, G. I. (1994). Price elasticities in international tourism. *Journal of Hospitality & Tourism Research 17*(3), 27–39.

Konovalova, A. A. and E. V. Vidishcheva (2013). Elasticity of demand in tourism and hospitality. *European Journal of Economic Studies 4*(2), 84–89.

Tussyadiah, I. and J. A. Pesonen (2015, October 12). Impacts of peer-to-peer accommodation use on travel patterns. *Journal of Travel Research*.

Notes

[1]Source: http://nextjuggernaut.com/blog/airbnb-business-model-canvas-how-airbnb\-works-revenue-insights/

[2]For example, a local farmer needs to buy seeds, cardboard boxes, and other materials, many of them from local vendors. The local cardboard manufacturer is a beneficiary of the farmer's spending. That cardboard manufacturer must buy his materials from businesses in other sectors, and so forth. Thus, the economic impact of the farmer includes, not just the direct spending that he is responsible for, but for the down-the-line spending from businesses to which he is connected.

[3] New Orleans visitor counts come from the following sources: http://www.nola.com/politics/index.ssf/2016/08/new_orleans_tourism_tax_revenu.html; http://www.neworleanswill.com/blog/breaking-new-ground-2014-tourism-numbers-2/; http://www.neworleansonline.com/pr/releases/releases/2014%20Visitation%20Release.pdf; http://www.neworleanscvb.com/articles/index.cfm?articleID=7792&menuID=1602; http://www.nola.gov/mayor/press-releases/2014/20140422-tourism-numbers/

[4]https://fred.stlouisfed.org/series/NEWO322LEIHN

[5]To be more precise, the sector is "transportation, information and public utilities." We believe the bulk of these jobs in New Orleans are transportation jobs (taxi services, and the like) rather than IT and public utilities jobs.

[6]This study can be accessed through http://www.crt.state.la.us/Assets/Tourism/research/documents/2015-2016/Louisiana%20Tourism%20Forecast%20Report%202016-2019.pdf

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