Improving Regional PCE Estimates Using Credit Card Transaction Data

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Exploratory work with First Data/Palantir

Data and coverage

Aggregate Market Data
  - ~50% of all U.S. Credit Card transaction spend
  - Point of Sale (POS) data from 4.5MM+ U.S. merchant locations
  - 600+ merchant categories in our data set
  - 58B transactions annually
  - $1.6 Trillion spend, 10% of GDP
  - All card-types, all banks, all networks, all 50 states, all customer segments, all merchant sizes
  - 800M+ cardholders, 100% transactions from each merchant

This pilot uses restricted data that includes:
  - National estimates on retail
  - Flow of spending across geography by establishments and consumer location

Palantir/FirstData: Retail Sales
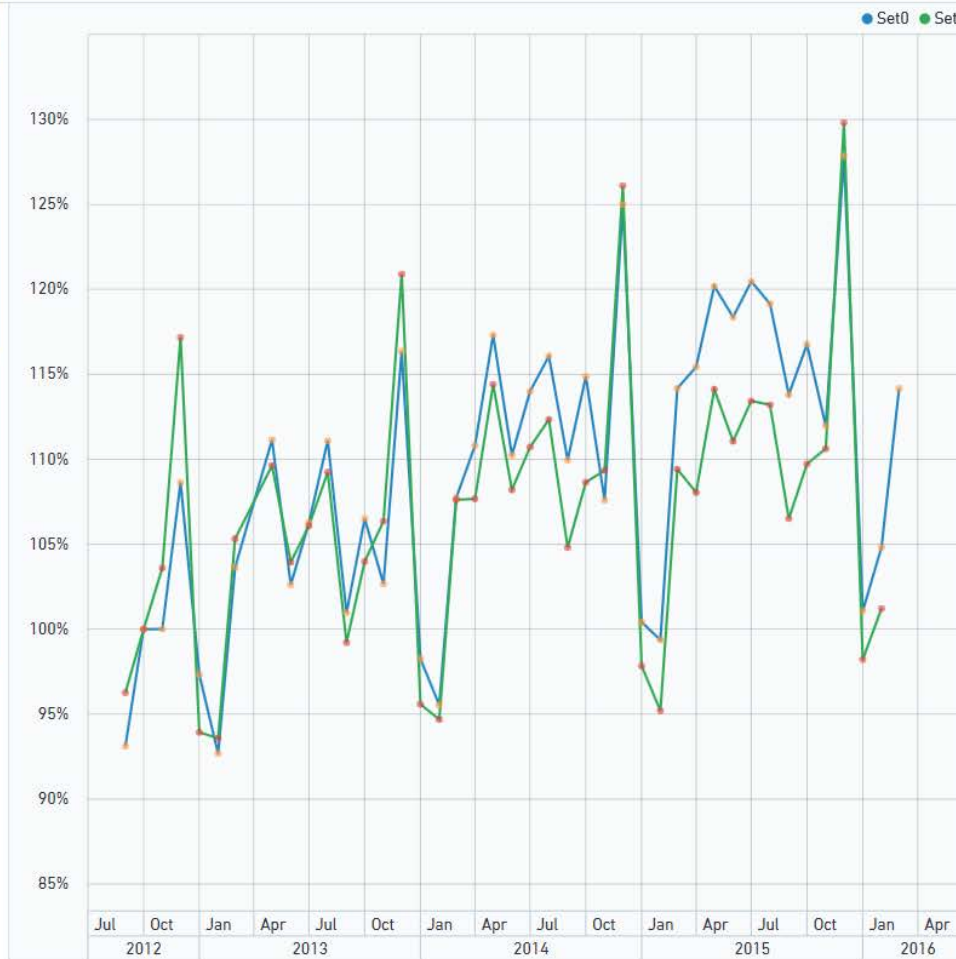
Palantir/FirstData - 448: Clothing Stores

Help to improve state level estimates of Personal Consumption Expenditures (PCE), and may help generate MSA level estimates
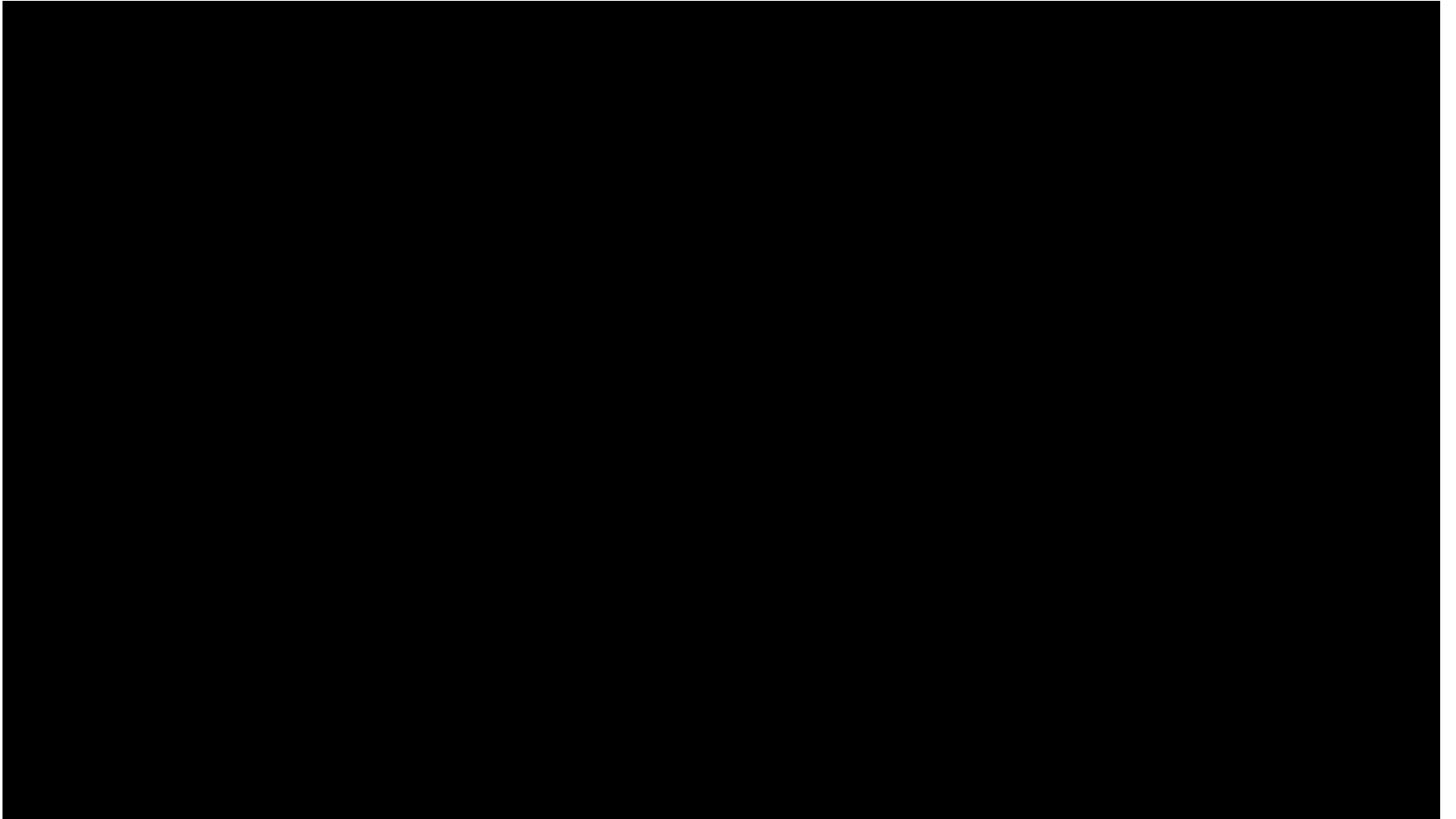
Adjusting Establishment Estimates from Census to Construct Regional PCE Statistics

- ## Current process

  - ### Criteria for adjustment

    - Sufficient evidence of out-of-state spending
    - Economic reason for adjustment
    - A good category match available in consumer expenditure survey data

  - ### Method

    - Adjust Census-based share with survey-based share
    - Rescale to national accounts totals

- ## First Data spending flows allows for a new approach

New Opportunity: Flows from First Data

Accommodation flows (NAICS 721)

To NV

Inflow Shares
- (.3,.9]
- (.1,.3]
- (.05,.1]
- (.02,.05]
- (.01,.02]
- [0,.01]

From NV

Outflow Shares
- (.3,.9]
- (.1,.3]
- (.05,.1]
- (.02,.05]
- (.01,.02]
- [0,.01]
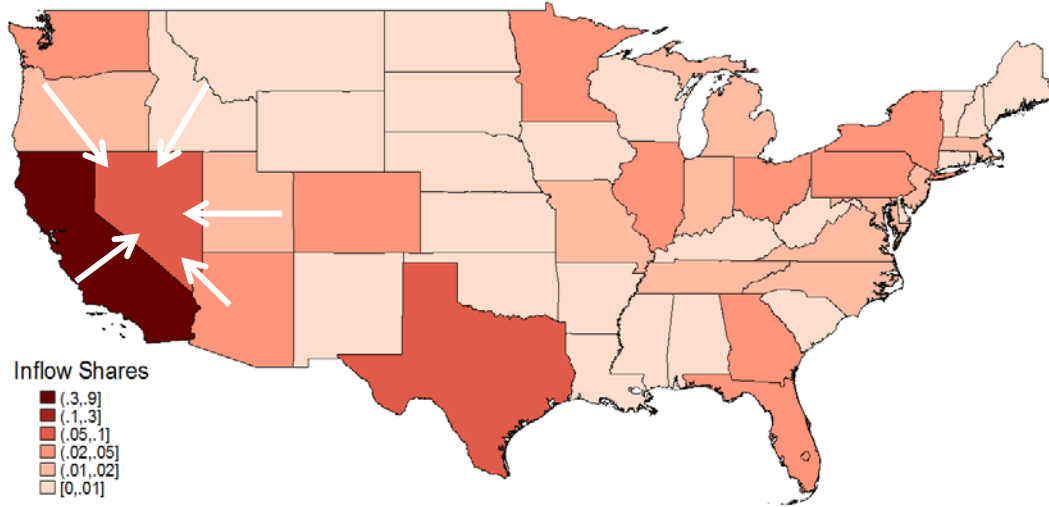
Spending Flows for PCE by State

- Allocate back spending that occurs within a state by residents of other states

- Example: 30.7% of accommodation spending that occurs in NV needs to be allocated back to CA

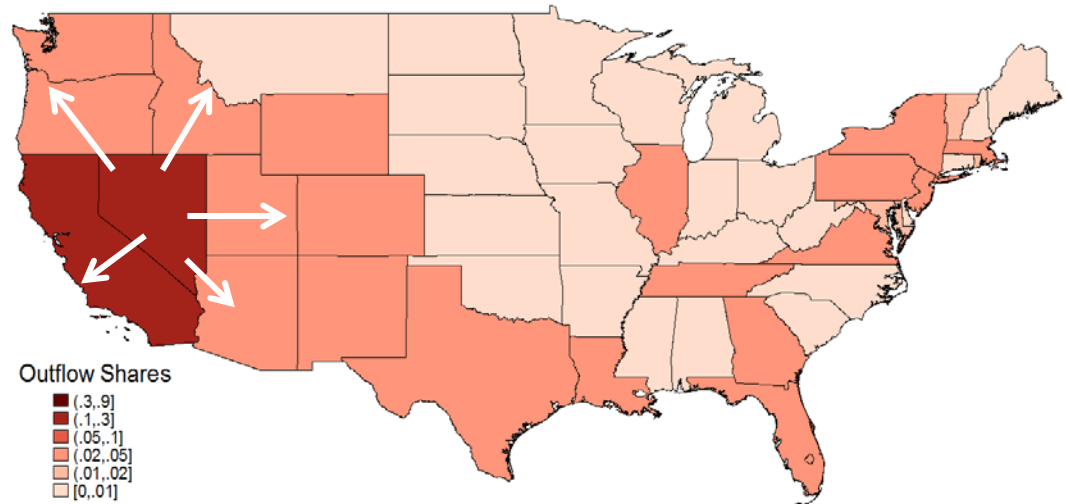|	Accommodations (NAICS 721)			Clothing (NAICS 448)			Grocery stores (NAICS 445)		
	Spending state			Spending state			Spending state		
	DC	HI	NV	DC	HI	NV	DC	HI	NV
Home state	CA (12.4%)	CA (34.5%)	CA (30.7%)	DC (39.4%)	HI (48.9%)	NV (31.8%)	DC (64.2%)	HI (72.3%)	NV (85.2%)
	DC (11.4%)	HI (12.2%)	TX (6.8%)	MD (17.5%)	CA (19.6%)	CA (20.5%)	MD (13.4%)	CA (9.7%)	CA (5.1%)
	NY (11.3%)	WA (6.7%)	NV (5.9%)	VA (15.3%)	WA (3.6%)	TX (7.5%)	VA (7.2%)	WA (2.8%)	AZ (0.8%)
	VA (6.0%)	TX (5.4%)	FL (4.5%)	NY (4.1%)	TX (3.5%)	FL (3.8%)	NY (2.1%)	TX (1.3%)	TX (0.8%)
	FL (5.0%)	NY (3.6%)	AZ (4.2%)	CA (3.5%)	NY(2.0%)	NY (3.0%)	CA (2.0%)	CO (1.1%)	FL (0.6%)

Spending Flows for PCE by State

Opportunities

- Flow shares can be readily incorporated and simplify the current methodology

- Spending and consumption flows across areas provide a unique view of geography of consumption

Considerations

- Varying data quality and coverage by industry and by geography

- Imputation of consumer location

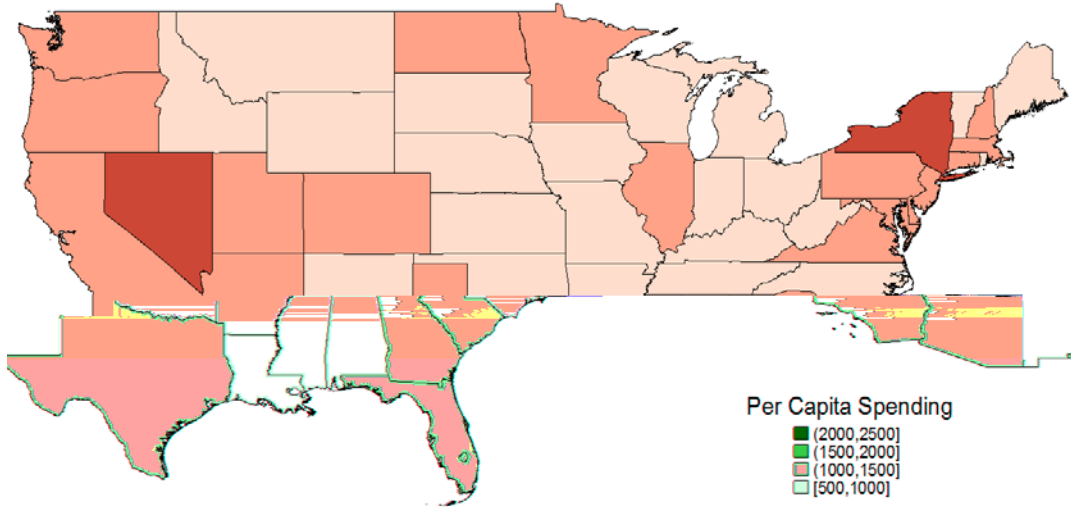# Consumption Flows and State Level PCE Estimates

Preliminary Estimates

Clothing and Footwear, 2012

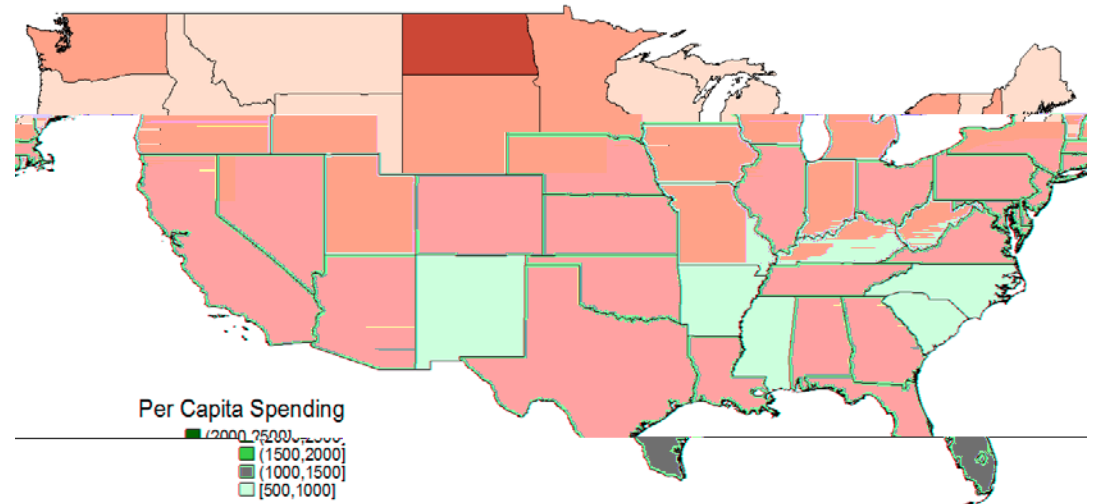| Initial estimates Geography	Per Capita	Difference from U.S. Value	Per Dollar of Disposable Income	Difference from U.S. Value
United States	$1,128	0.0%	0.029	0.0%
Illinois	$1,154	2.3%	0.028	-0.5%
Hawaii	$1,813	60.8%	0.045	57.0%
Nevada	$1,796	59.3%	0.050	75.4%

Incorporating FD flows Geography	Per Capita	Difference from U.S. Value	Per Dollar of Disposable Income	Difference from U.S. Value
United States	$1,128	0.0%	0.029	0.0%
Illinois	$1,149	1.8%	0.028	-0.9%
Hawaii	$1,339	18.7%	0.033	15.9%
Nevada	$1,071	-5.1%	0.030	4.5%

Clothing and Footwear, 2012

Initial estimates

Per Capita Spending
- (2000,2500]
- (1500,2000]
- (1000,1500]
- [500,1000]

Incorporating FD flows

Per Capita Spending
- (2000,2500]
- (1500,2000]
- (1000,1500]
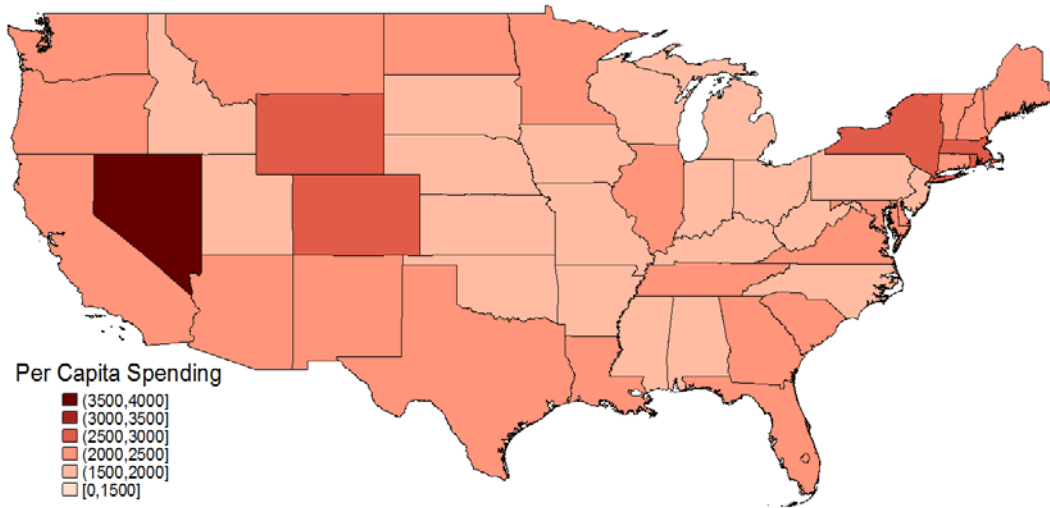- [500,1000]

Preliminary Estimates

Food Services and Accommodations, 2012

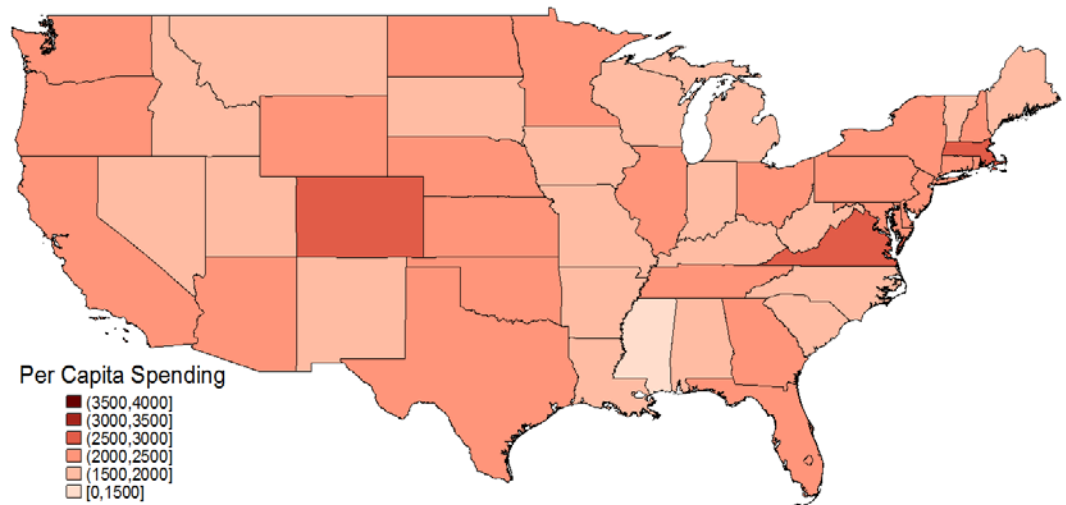| Initial estimates Geography	Per Capita	Difference from U.S. Value	Per Dollar of Disposable Income	Difference from U.S. Value
United States	$2,181	0.0%	0.055	0.0%
Illinois	$2,193	0.6%	0.054	-2.2%
Hawaii	$5,807	166.2%	0.144	159.9%
Nevada	$3,992	83.0%	0.111	101.5%

Incorporating FD flows Geography	Per Capita	Difference from U.S. Value	Per Dollar of Disposable Income	Difference from U.S. Value
United States	$2,181	0.0%	0.055	0.0%
Illinois	$2,359	8.2%	0.058	5.2%
Hawaii	$2,763	26.7%	0.068	23.7%
Nevada	$1,578	-27.7%	0.044	-20.3%

Food Services and Accommodations, 2012

Initial estimates

Per Capita Spending
- (3500,4000]
- (3000,3500]
- (2500,3000]
- (2000,2500]
- (1500,2000]
- [0,1500]

Incorporating FD flows

Per Capita Spending
- (3500,4000]
- (3000,3500]
- (2500,3000]
- (2000,2500]
- (1500,2000]
- [0,1500]

Consumption Flows and MSA Level PCE Estimates

Preliminary Estimates

Clothing and Footwear, 2012

Initial estimates Geography	Per Capita	Difference from U.S. Value	Per Dollar of Personal Income	Difference from U.S. Value
United States	$1,128	0.0%	0.026	0.0%
Kansas City, MO-KS	$995	-11.7%	0.022	-12.8%
Kahului-Wailuku-Lahaina, HI	$2,683	137.9%	0.070	175.3%
Las Vegas-Henderson-Paradise, NV	$2,936	160.3%	0.076	197.7%

Incorporating FD flows Geography	Per Capita	Difference from U.S. Value	Per Dollar of Personal Income	Difference from U.S. Value
United States	$1,128	0.0%	0.026	0.0%
Kansas City, MO-KS	$1,002	-11.1%	0.022	-12.2%
Kahului-Wailuku-Lahaina, HI	$1,616	43.2%	0.042	65.8%
Las Vegas-Henderson-Paradise, NV	$1,749	55.1%	0.045	77.3%

Clothing and Footwear, 2012
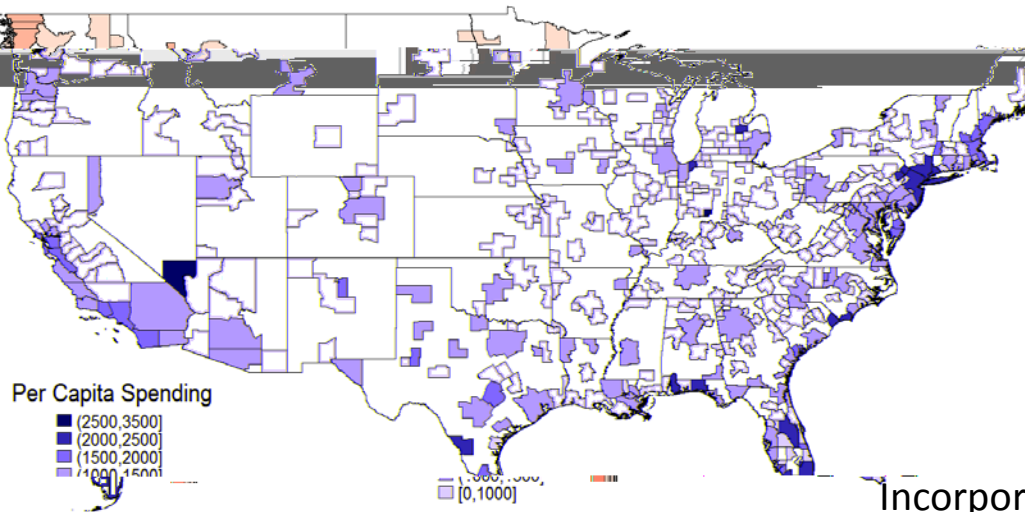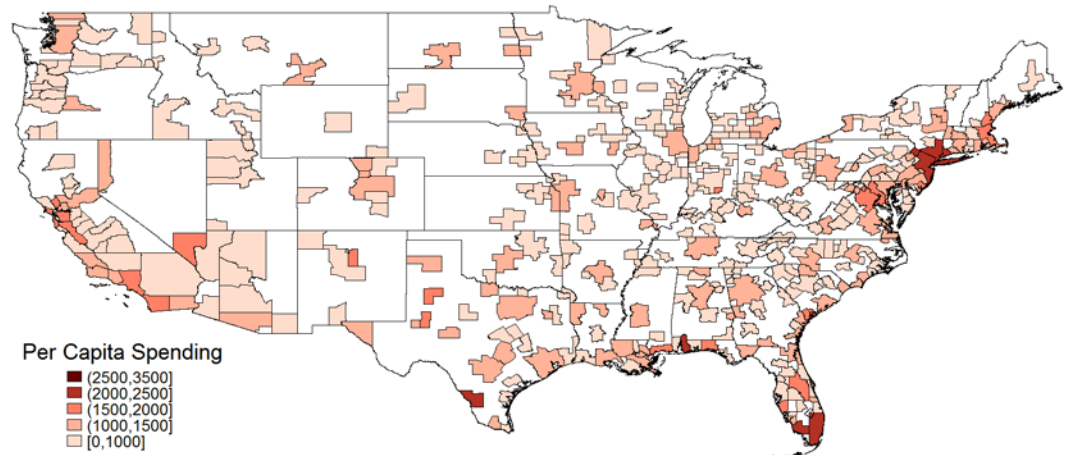
Initial estimates

Per Capita Spending

Per Capita Spending
- (2500,3500]
- (2000,2500]
- (1500,2000]
- (1000,1500]
- [0,1000]

Incorporating FD flows

Per Capita Spending
- (2500,3500]
- (2000,2500]
- (1500,2000]
- (1000,1500]
- [0,1000]

Preliminary Estimates

Food Services and Accommodations, 2012

Initial estimates Geography	Per Capita	Difference from U.S. Value	Per Dollar of Personal Income	Difference from U.S. Value
United States	$2,181	0.0%	0.049	0.0%
Kansas City, MO-KS	$2,117	-3.0%	0.047	-4.2%
Kahului-Wailuku-Lahaina, HI	$9,597	340.0%	0.251	409.3%
Las Vegas-Henderson-Paradise, NV	$7,707	253.4%	0.199	304.1%

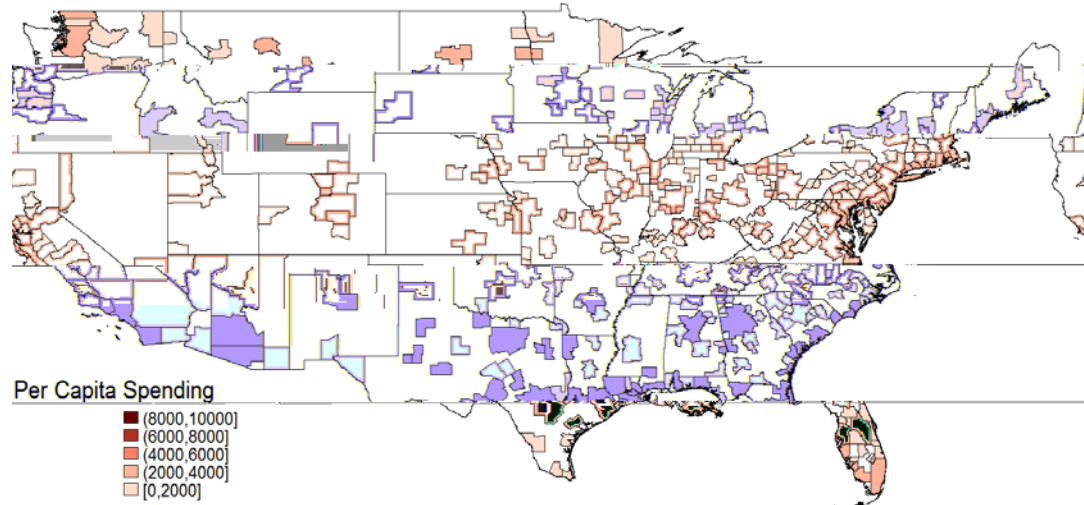| Incorporating FD flows Geography	Per Capita	Difference from U.S. Value	Per Dollar of Personal Income	Difference from U.S. Value
United States	$2,181	0.0%	0.049	0.0%
Kansas City, MO-KS	$2,231	2.3%	0.050	1.0%
Kahului-Wailuku-Lahaina, HI	$3,443	57.8%	0.090	82.7%
Las Vegas-Henderson-Paradise, NV	$2,832	29.8%	0.073	48.5%

Food Services and Accommodations, 2012

Initial estimates

Per Capita Spending

Per Capita Spending
- (8000,10000]
- (6000,8000]
- (4000,6000]
- (2000,4000]
- [0,2000]

Incorporating FD flows

Per Capita Spending
- (8000,10000]
- (6000,8000]
- (4000,6000]
- (2000,4000]
- [0,2000]
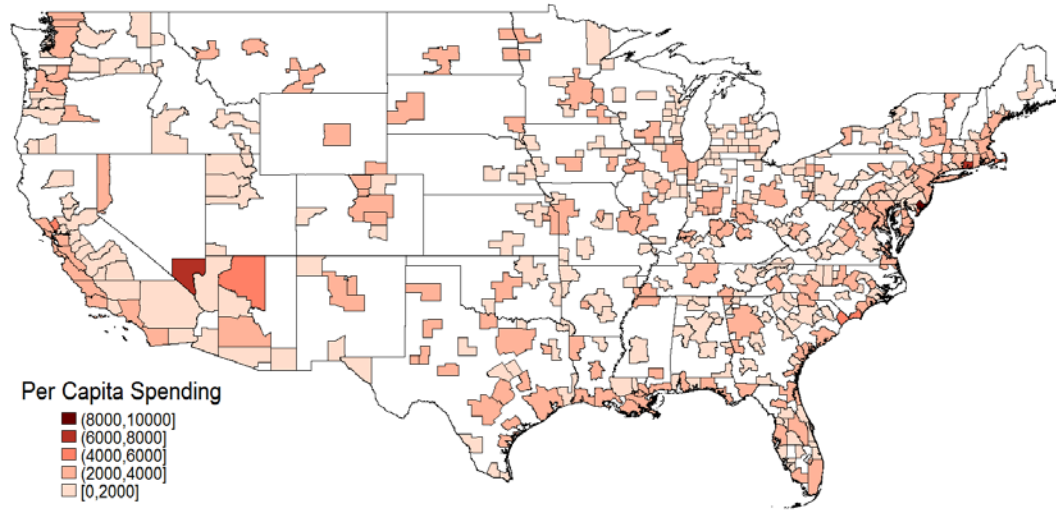
Next Steps

- Continue working with data to refining adjustment for reginal PCE.

- Refine the home location algorithm and further evaluate flow information.

- Investigate e-commerce data.