



America's Online Jobs

Conceptualizations, Measurements, and
Influencing Factors

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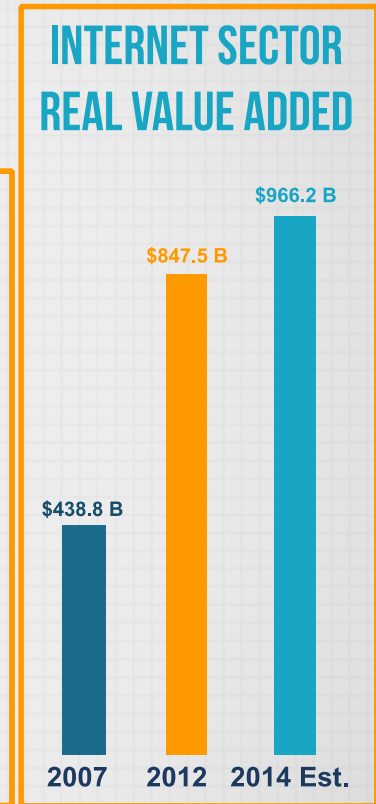
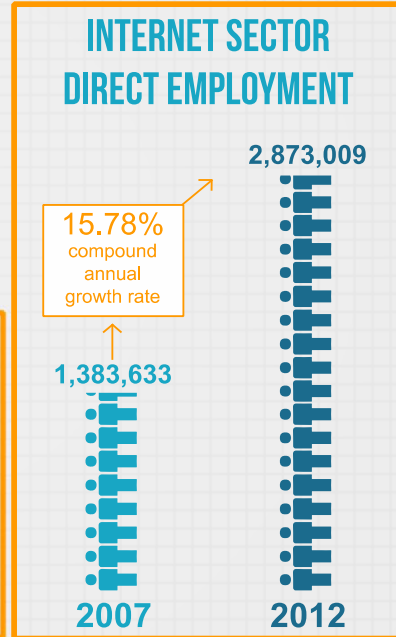
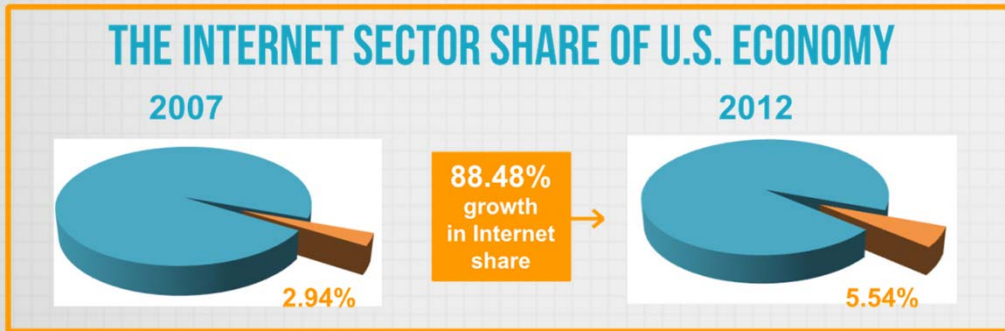
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Internet Sector Macroeconomic

- 6% of US GDP (2014)
- 3.0-3.6 million jobs
- 2007-2014: Internet GDP doubled
- 2007-2012: Internet employment % grew 7x faster than next closest industry



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Internet Sector Microeconomic

| | 44 Members | |
|---|-------------------|---------|
| | Total | Average |
| Combined Market Capitalization & Valuation | \$ 3.351 trillion | \$ 76.2 |
| Combined Annual Revenue | \$ 504.3 billion | \$ 11.5 |
| Combined Annual Profit | \$ 196.4 billion | \$ 4.5 |
| Combined Number of Employees | 751,064 | 17,070 |

**All figures are estimates based on publicly available, company-reported figures*



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How many people participate in the online 'labor market'?
What is the correct conceptualization for online work?

America's Online Jobs

| Articles | Term Used | Definition |
|-------------------------------------|---|---|
| Farrell & Greig (2016) | Online work platform | "Marketplace for work by unbundling a job into discrete tasks and directly connecting individual sellers with consumers. These flexible, highly accessible opportunities to work generate earnings that are volatile by choice." |
| Hathaway & Muro (2016); Muro (2016) | Gig economy | "App-based freelancing" (operationalized by the number of non-employer firms) |
| Harris & Krueger (2015) | Independent worker | Those who can choose their work (like independent contractors) but are restricted by an intermediary on how much they can charge for goods and services |
| Katz & Krueger (2016) | Alternative work arrangements | Non-traditional work as the individual's main job, such as temporary help, on-call jobs, independent contract work, and freelancers (with emphasis on subset of those direct selling using online intermediaries) |
| Manyika et al. (2016) | Independent work | Work with 3 distinctive features: 1) high level of control and autonomy, 2) payment by task, assignment, or sale, and 3) short-term duration |
| Robles & McGee (2016) | Enterprising and informal work activity (online) | Paid work related to 1) completion of online tasks through websites, 2) renting out property through websites, flyers, and ads, 3) selling or new or used goods, and handcrafts through websites, and 4) other online paid activities |
| Smith (2016) | Shared, collaborative, and on-demand goods and services | Use of one or more of the following services: 1) purchasing used or second-hand goods online, 2) using programs offering same-day or expedited delivery, 3) purchasing tickets from an online reseller, 4) purchasing handmade or artisanal products online, 5) contributing to an online fundraising project, 6) using ride-hailing apps, 7) ordering delivery of groceries online from local store, 8) working in a shared office space, 9) hiring someone online for errand/task, and 10) renting clothing, other products for a short time online |
| Torpey & Hogan (2016) | Gig work | "Single project or task for which a worker is hired, often through a digital marketplace, to work on demand" |
| Upwork (2016) | Freelancers | "Individuals who have engaged in supplemental, temporary, project- or contract-based work, within the past 12 months" |

America's Online Jobs

| Authors | Percent finding | Applicable population | Volume Estimate |
|-------------------------|---|-----------------------|----------------------------|
| Farrell & Greig (2016) | 4% (over 2012-2015) 1% in September 2015 | 205,354,000* | 2.9 million 2.1 million |
| Harris & Krueger (2015) | 0.4% | 249,454,440** | 1.0 million |
| Katz & Krueger (2016) | 0.453% | 249,454,440** | 1.1 million |
| Manyika et al. (2016) | 3-5% | 165,145,000*** | 5.0-8.3 million |
| Robles & McGee (2016) | 7% | 205,354,000* | 14.4 million |

*Adults (ages 15-64), OECD
 **Adults (ages 18 or older), Census Bureau
 ***US Labor force (2017), Bureau of Labor Statistics



Is “How many *people* participate in the online ‘labor market’?” the right question?



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America's Online Jobs **Concept**

Popular components:

- ~~The short-term nature of the transactions~~
- ~~High degree of worker autonomy~~
- The use of an online intermediary

Conceptual issues:

- Cannot tie each one to unique 'individuals'
- Current definitions rely on traditional labor market concepts
 - Work, jobs, contract, task, etc.
- Sharing economy terminology
 - Gig, sharing, freelance, etc.

America's Online Jobs Definition

Online income positions

The paper defines *online income positions* as registered commercial positions that are 1) facilitated through online intermediaries, which also serve as financial intermediaries in the transactions, and 2) that allow an individual or business to earn revenue.

**Online income opportunities*

***Online income participants*

America's Online Jobs Methodology

Survey of Internet Association's 40+ member companies in the Spring and Summer of 2017

Targeted set of five variables/indicators for 2012-2017 and for multiple geographic aggregations within the United States

*Included an indicator for *online income positions*

**All data anonymized

Explanations for how each of the five variables was conceptualized within the activity type of each specific companies



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America's Online Jobs Methodology

Survey issues:

- Incomplete reporting - the report utilized publicly available data provided exclusively from company-produced and or company-reported materials
- Variation of company-reported data in terms of the years of observation and geographic aggregation

America's Online Jobs Results

| Authors | Percent finding | Applicable population | Volume Estimate |
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| Hooton (2017) | 23.9 million**** | | |
| <p>*Adults (ages 15-64), OECD **Adults (ages 18 or older), Census Bureau ***US Labor force (2017), Bureau of Labor Statistics ****OIPs, current report</p> | | | |



America's Online Jobs Policy

Implications

- Much larger number of OIPs exist than have previously been estimated
- OIPs are distributed across all 50 states and the District of Columbia
 - More concentrated in the top states than traditional employment;
 - Less tied to population than traditional employment
- Key drivers
 - Relative income to cost factors
 - Internet accessibility
 - Exposure to the internet sector more broadly
 - Not (un)employment levels

America's Online Jobs Conclusion

- Using estimates of income per OIP, \$72 billion to \$478 billion of additional economic activity and income for individuals
 - *Construction Services Industry* sector ~ \$1 trillion, but
 - NOT about determining exact economic contributions
- Removal of market barriers
- The main lesson of the paper, and the OIP market more generally, is that our conceptualizations of what work should be like are exceptionally outdated

Thank you!

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Our Members

Internet Association is the only trade association that exclusively represents leading global internet companies on matters of public policy.

Our mission is to foster innovation, promote economic growth, and empower people through the free and open internet.

We believe the internet creates unprecedented benefits for society, and as the voice of the world's leading internet companies, Internet Association works to ensure legislators, consumers, and other stakeholders understand these benefits.

| | | |
|--------------|---------------|-------------------|
| airbnb | amazon | coinbase |
| DOORDASH | Dropbox | ebay |
| Etsy | Eventbrite | Expedia |
| facebook | Google | GROUPON |
| handy | HomeAway | IAC |
| intuit | letgo | LinkedIn |
| lyft | matchgroup | Microsoft |
| NETFLIX | pandora | PayPal |
| Pinterest | Quicken Loans | rackspace HOSTING |
| reddit | salesforce | Snap Inc. |
| Spotify | SurveyMonkey | Thumbtack |
| TransferWise | tripadvisor | TURO |
| twilio | UBER | zenefits |
| upwork | VIVIDSEATS. | yelp |
| zenefits | Zillow GROUP | |



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Internet Association Identification

**TABLE A-4
NAICS INDUSTRY CLASSIFICATIONS THAT INCLUDE INTERNET ACTIVITIES**

| NAICS CODE | INDUSTRY TITLE |
|------------------------------|---|
| Product Line Receipts | |
| 518210 | Data processing, hosting and related services |
| 5171 | Wired Telecommunications carriers |
| 5172 | Wireless telecommunications carriers (except satellite) |
| 517919 | All Other Telecommunications |
| 51913 | Internet publishing and broadcasting and Web Search Portals |
| 54151 | Computer Systems Design and related services |
| E-Commerce Retail | |
| 45411 | Electronic shopping |
| 454112 | Electronic auction |
| Selected Services | |
| Various | Selected Services - E-Commerce |



Internet Association Results

| Authors | Percent finding | Applicable population | Volume Estimate |
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Internet Association Results

| | Minimum | Median | Mean | Max |
|--|----------|-----------|-----------|------------|
| Online Income Positions | 19,839 | 206,666 | 467,972 | 5,822,078 |
| Internet Employment | 3,570 | 35,982 | 70,663 | 529,832 |
| Total Internet-Supported Positions | 25,062 | 246,625 | 538,635 | 6,351,911 |
| Total employment (any industry) | | | | |
| Total employment (any industry) | 265,800 | 1,894,200 | 2,818,627 | 16,923,300 |
| Population | 585,501 | 4,436,974 | 6,335,834 | 39,250,017 |
| GDP Per Capita | \$35,160 | \$52,130 | \$55,950 | \$159,400 |
| Poverty Rate | 8.5% | 15.3% | 15.0% | 22.6% |
| Unemployment Rate | 2.3% | 4.2% | 4.2% | 6.7% |

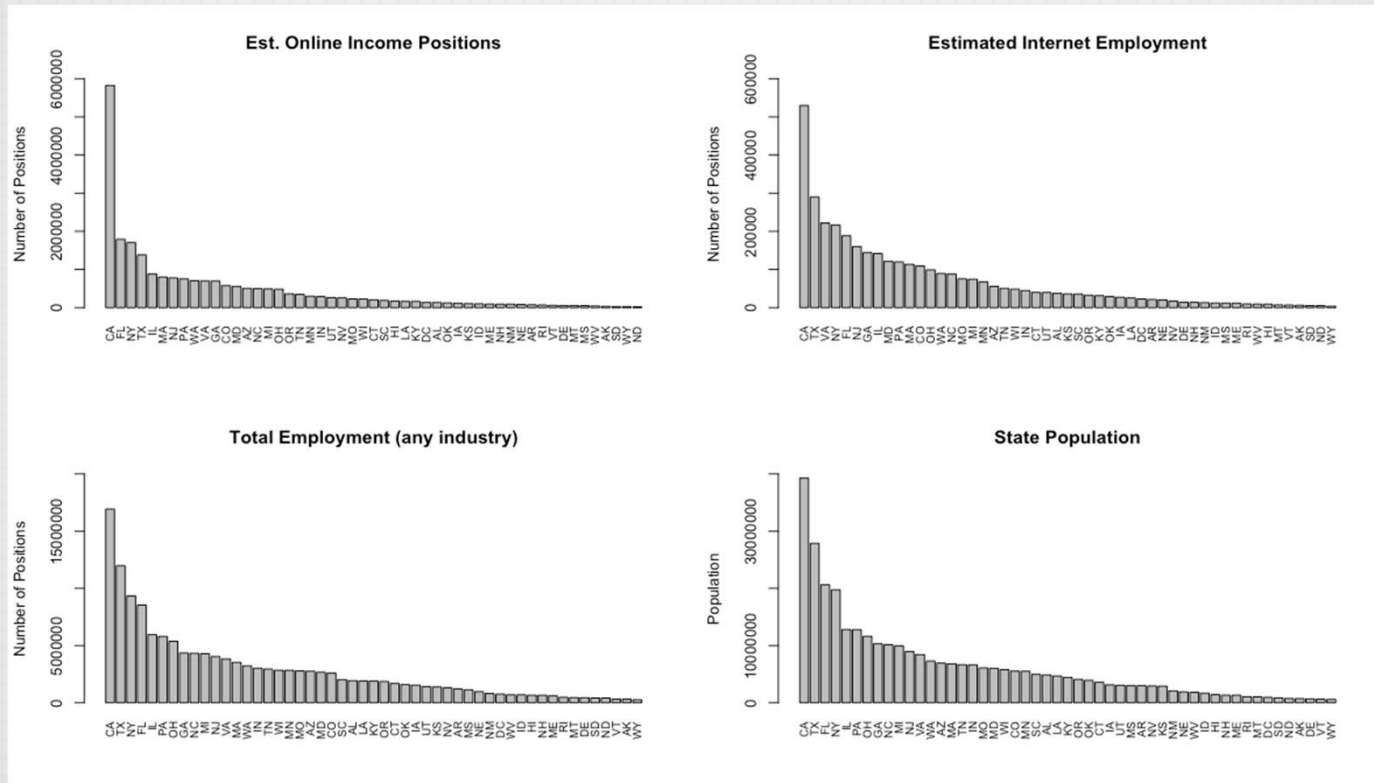


Internet Association Results

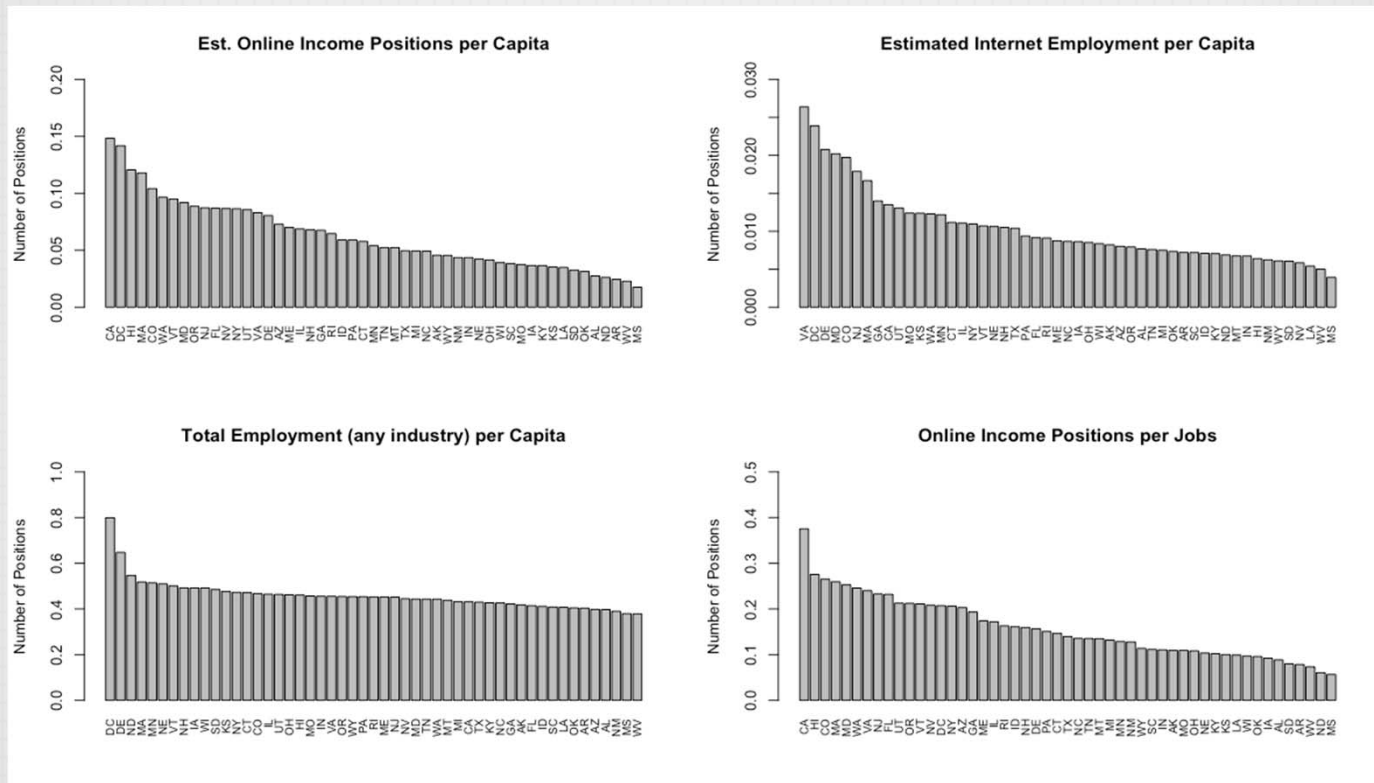
| | OIPs (2017) | Total Employment (2017) | Unemployment (2017) | Internet Employees (2014) | Population (2016) | OIPs per Employee | OIPs per capita |
|----|-------------|-------------------------|---------------------|---------------------------|-------------------|-------------------|-----------------|
| CA | 5,822,078 | 16,923,300 | 4.7% | 529,833 | 39,250,017 | 0.34 | 0.15 |
| FL | 1,792,347 | 8,538,900 | 4.3% | 188,525 | 20,612,439 | 0.21 | 0.09 |
| NY | 1,707,212 | 9,332,500 | 4.4% | 216,478 | 19,745,289 | 0.18 | 0.09 |
| TX | 1,381,564 | 11,974,700 | 4.8% | 289,774 | 27,862,596 | 0.12 | 0.05 |
| IL | 880,321 | 5,947,600 | 4.6% | 141,714 | 12,801,539 | 0.15 | 0.07 |
| MA | 802,837 | 3,530,400 | 4.2% | 113,538 | 6,811,779 | 0.23 | 0.12 |
| NJ | 780,719 | 4,042,100 | 4.1% | 160,060 | 8,944,469 | 0.19 | 0.09 |
| PA | 754,369 | 5,799,800 | 5.0% | 119,861 | 12,784,227 | 0.13 | 0.06 |
| WA | 703,701 | 3,227,900 | 4.5% | 89,637 | 7,288,000 | 0.22 | 0.10 |
| VA | 698,013 | 3,831,600 | 3.8% | 221,801 | 8,411,808 | 0.18 | 0.08 |
| | | | | | | | |
| CO | 576,781 | 2,588,600 | 2.3% | 109,250 | 5,540,545 | 0.22 | 0.10 |
| ND | 19,839 | 414,400 | 2.5% | 5,224 | 757,952 | 0.05 | 0.03 |



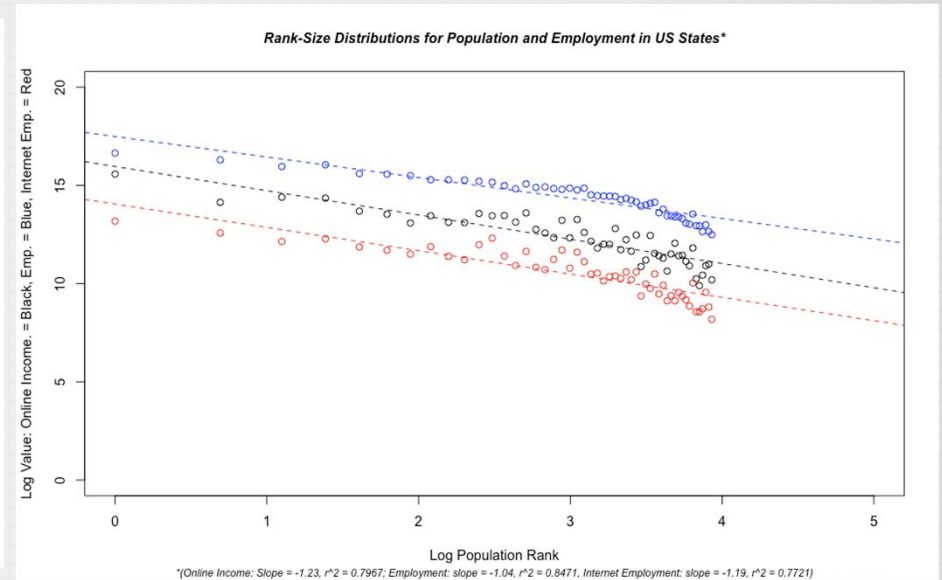
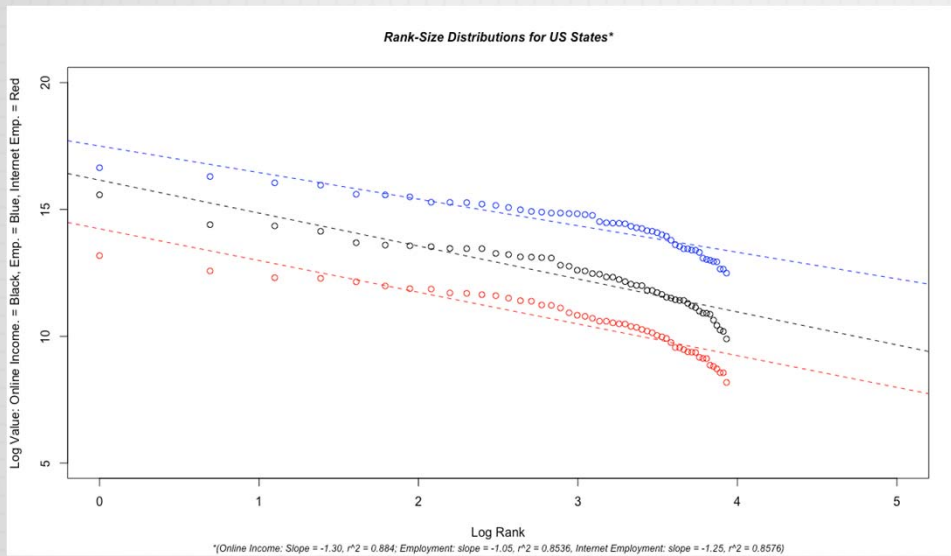
Internet Association Results



Internet Association Results



Internet Association Results



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Internet Association Results

$$y_i = \beta_{i,0} + \beta_1 x_{i,1} + \beta_2 x_{i,2} + \dots + \beta_p x_{i,p} + \varepsilon_i$$

| Theoretical component | Potential corollary | Expected correlation | Rationale |
|---------------------------------|--|----------------------|--|
| Traditional labor market health | Population | Positive | Larger number of people who may choose to use OIPs |
| | Unemployment | Positive | Larger number of people who may need an alternative to a traditional job |
| Relative costs and incomes | Poverty Rate | Positive | Larger number of people who may desire supplemental income |
| | GDP per Capita | Negative | |
| | Cost of Living | Positive | |
| Access and exposure | Internet sector employment | Positive | Greater familiarity with OIPs and greater willingness to use |
| | IA Ease of Doing Internet Business Index | Positive | Lower restrictions on the participation in OIP markets |
| | IA General Business Governance Index | Positive | |
| | IA Internet Access Index | Positive | |

Internet Association Results

| | Dependent: Log Online Income Positions Per Capita | | | | |
|---|---|-------------------------|-------------------------|-------------------------|-------------------------|
| | (1) | (2) | (3) | (4) | (5) |
| Constant | -7.5068*** (1.8157) | -1.3843 (1.6125) | -7.8453*** (1.8586) | -5.8681*** (1.5946) | -5.4839*** (1.4052) |
| Log Unemployment Rate | -0.1564 (0.2083) | 0.3422 (0.2482) | -0.1287 (0.2111) | -0.0935 (0.1781) | |
| Log Poverty Rate | 0.3264 (0.2693) | 0.1954 (0.3107) | 0.3099 (0.2705) | 0.5105** (0.2335) | 0.4503** (0.2018) |
| Log Cost of Living Index | 1.9480*** (0.3309) | | 2.0379*** (0.3465) | 1.3138*** (0.3191) | 1.2819*** (0.3108) |
| Log GDP Per Capita | -0.2947 (0.2160) | -0.1844 (0.2490) | -0.3334 (0.2208) | -0.3034 (0.1841) | -0.3244* (0.1782) |
| Log Internet Sector Employment Per Capita | 0.6653*** (0.1250) | 0.3026* (0.1725) | 0.6766*** (0.1259) | 0.4191*** (0.1213) | 0.4141*** (0.1199) |
| IA Ease of Int. Bus. Index | | 0.0278*** (0.0072) | | | |
| IA General Bus. Governance Index | | | 0.0056 (0.0063) | | |
| IA Internet Access Index | | | | 0.0126*** (0.0030) | 0.0127*** (0.0029) |
| Observations | 51 | 51 | 51 | 51 | 51 |
| R ² | 0.6787 | 0.5725 | 0.6844 | 0.7719 | 0.7705 |
| Adjusted R ² | 0.6430 | 0.5251 | 0.6414 | 0.7408 | 0.7450 |
| Residual Std. Error | 0.2938 (df = 45) | 0.3388 (df = 45) | 0.2944 (df = 44) | 0.2503 (df = 44) | 0.2483 (df = 45) |
| F Statistic | 19.0096*** (df = 5; 45) | 12.0549*** (df = 5; 45) | 15.9047*** (df = 6; 44) | 24.8148*** (df = 6; 44) | 30.2091*** (df = 5; 45) |

Note:

*p<0.1; **p<0.05; ***p<0.01



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| VIF Scores of Specification 5 | |
|---|-----------|
| Independent Variable | VIF Score |
| Log Poverty Rate | 1.5343 |
| Log Cost of Living Index | 1.8961 |
| Log GDP Per Capita | 1.7460 |
| Log Internet Sector Employment Per Capita | 2.0083 |
| IA Internet Access Index | 2.6137 |

Internet Association Results

Table 8: Bootstrap Error Results (specification 5)

| | R | original | bootBias | bootSE | bootMed | p-value* | 95% CI |
|----------------------------|------|----------|----------|--------|---------|----------|--------------------|
| Constant | 2000 | -0.6642 | 0.1129 | 1.3299 | -0.5328 | 0.4648 | (-3.3837, 1.8295) |
| Poverty Rate | 2000 | 0.4320 | -0.0046 | 0.2161 | 0.4365 | 0.4893 | (0.0130, 0.8601) |
| Cost of Living | 2000 | 0.0110 | -0.0005 | 0.0030 | 0.0110 | 0.5092 | (0.0056, 0.0174) |
| GDP Per Capita | 2000 | -0.3375 | -0.0150 | 0.2240 | -0.3644 | 0.5417 | (-0.7615, 0.1166) |
| Internet Sector Employment | 2000 | 0.4205 | 0.0053 | 0.1350 | 0.4257 | 0.4748 | (0.1505, 0.6798) |
| Internet Access | 2000 | 0.0130 | 0.0001 | 0.0030 | 0.0133 | 0.4708 | (0.0070, 0.0188) |

*Difference between sample estimated coefficients and boot estimated coefficients; H0: there is no difference between the original estimate and the bootstrap estimate; no bootstrap estimates values are statistically different from original model estimates

