BLS Public Data API

Overview

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9 November 2017

BLS Public Data API

- What is it
- Usage history
- What can you do with it
- How to get started
- How to use it
- Lessons Learned
- Questions for the DUAC/Discussion

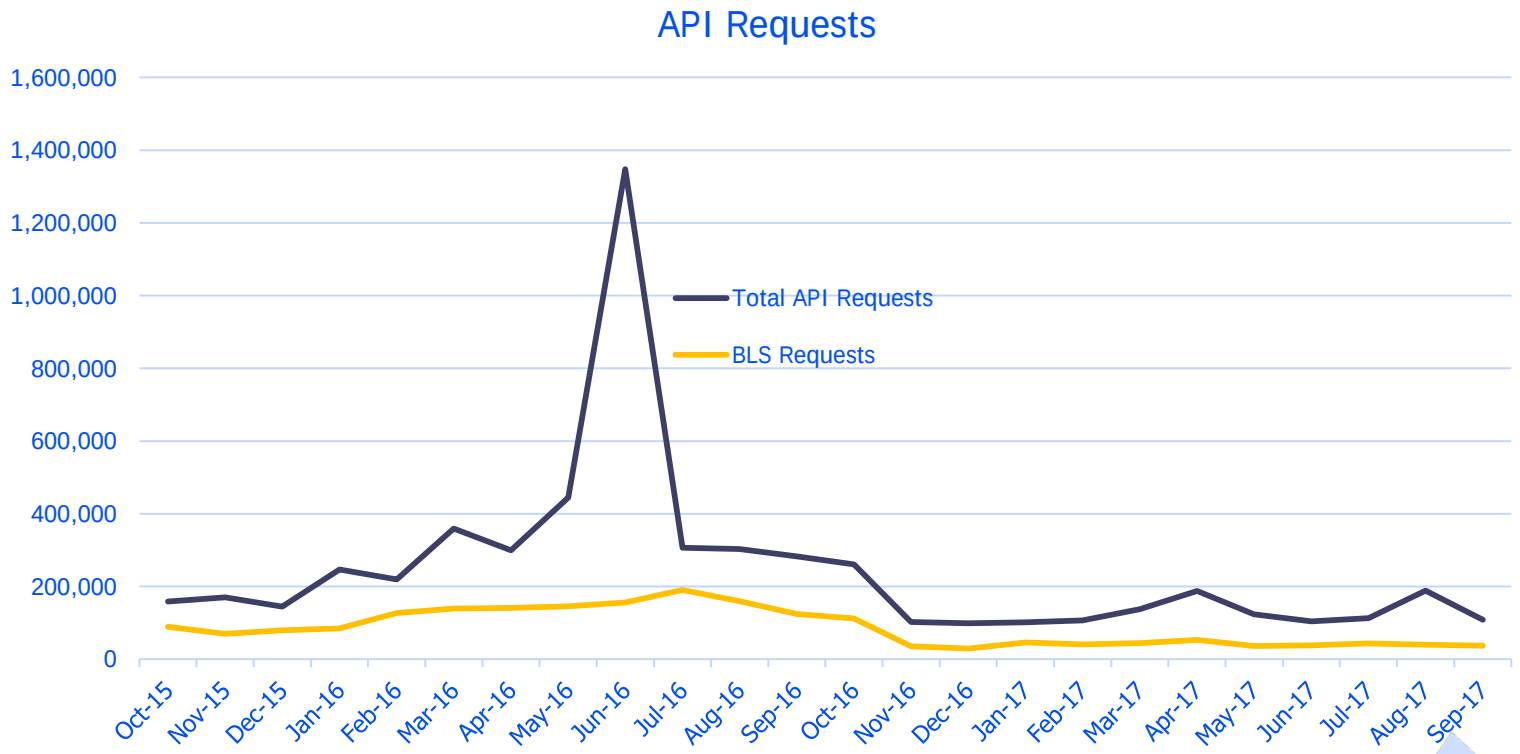
BLS API at a Glance

- What is it?
  - Data retrieval targeted for application developers
  - Replace Web scraping
- How does it work?
  - HTTPS-based API
  - JSON and XLSX outputs

2 years of BLS API usage

Lowest # of requests **97K** (June 2015) -- Highest # of requests **23M** (Nov 2013)

Lowest # of unique IPs **748** (June 2014) -- Highest # unique IPs **13093** (Apr 2014)



Web scraping

```
<input type="hidden" name="to_year" value="2017"/>
<input type="hidden" name="from_year" value="2007"/>
<input type="hidden" name="output_format" value="excelTable">
<input type="hidden" name="original_output_type" value="default"/>
<input type="hidden" name="annualAveragesRequested" value="false">
<input type="hidden" name="series_id" value="CES0000000001"/></FORM>

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<TH scope="row">Year</TH><TH scope="col">Jan</TH><TH scope="col">Feb</TH><TH scope="col">Mar</TH><TH scope="col">Apr</TH><TH scope="col">May</TH><TH scope="col">Jun</TH><TH scope="col">Jul</TH><TH scope="col">Aug</TH><TH scope="col">Sep</TH><TH scope="col">Oct</TH><TH scope="col">Nov</TH><TH scope="col">Dec</TH></TR>
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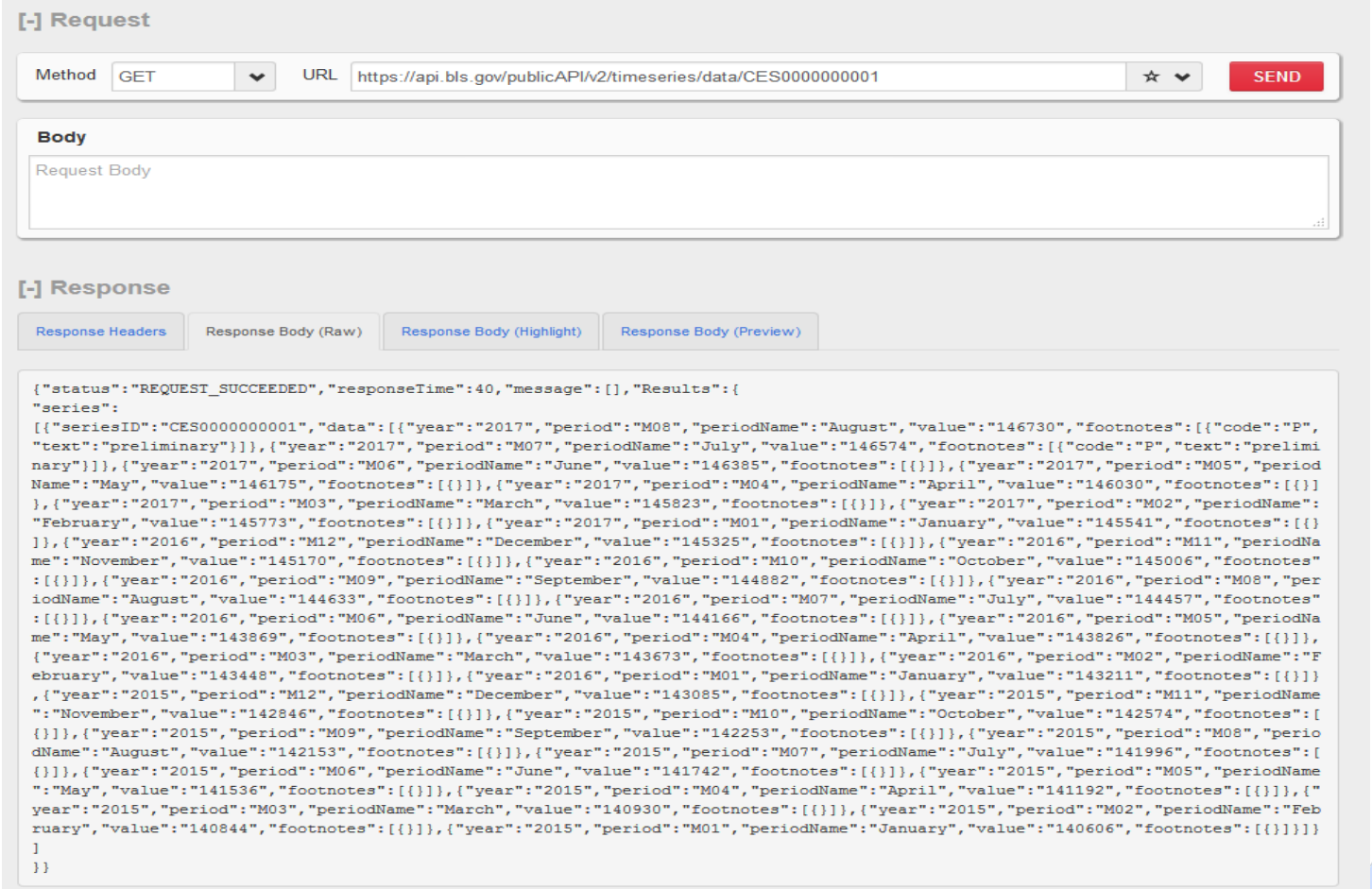
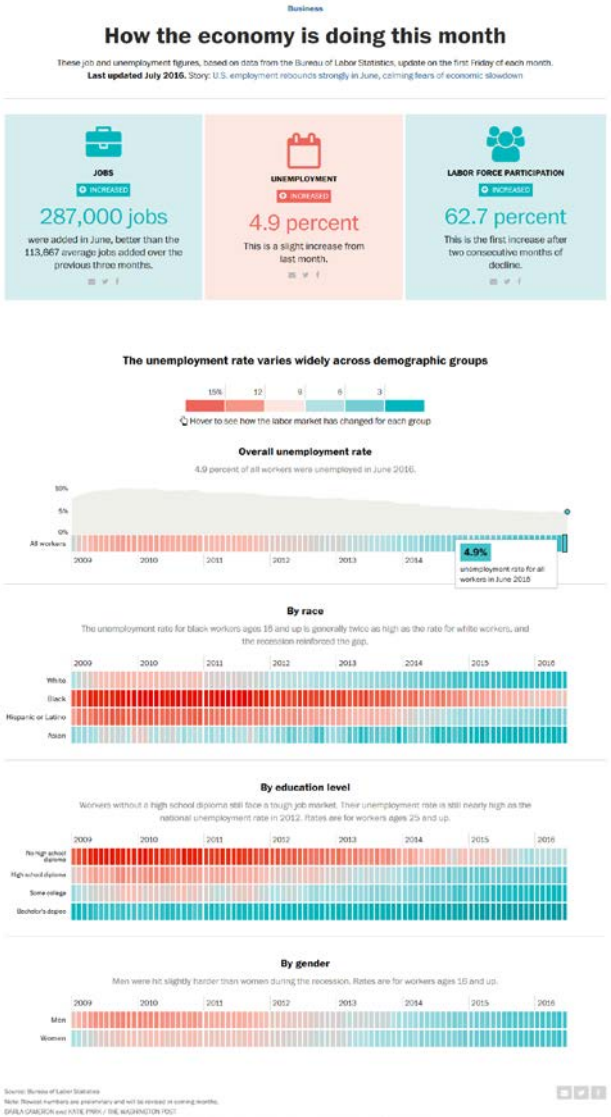
API equivalent



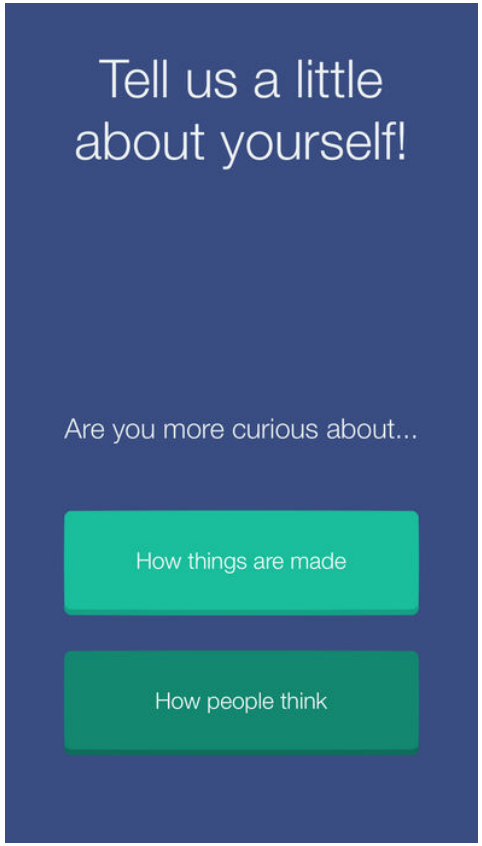
BLS API Use Case 1



- Washington Post Jobs Report
- https://www.washingtonpost.com/graphics/business/jobs-report/

Source: The Washington Post

BLS API Use Case 2

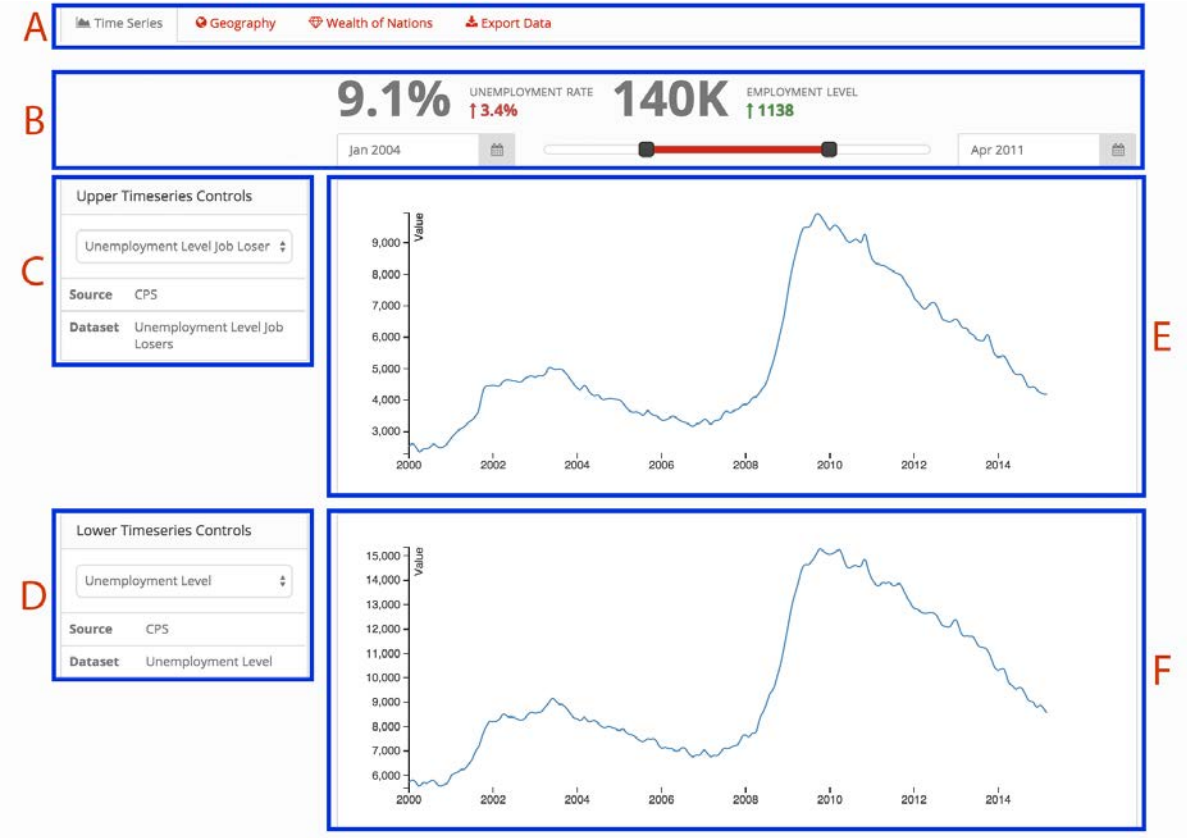


- Flatiron School https://flatironschool.com/
- Students developed CareerSpark an iOS application that uses employment and occupational data from the BLS for career exploration as part of the Opportunity project https://opportunity.census.gov/

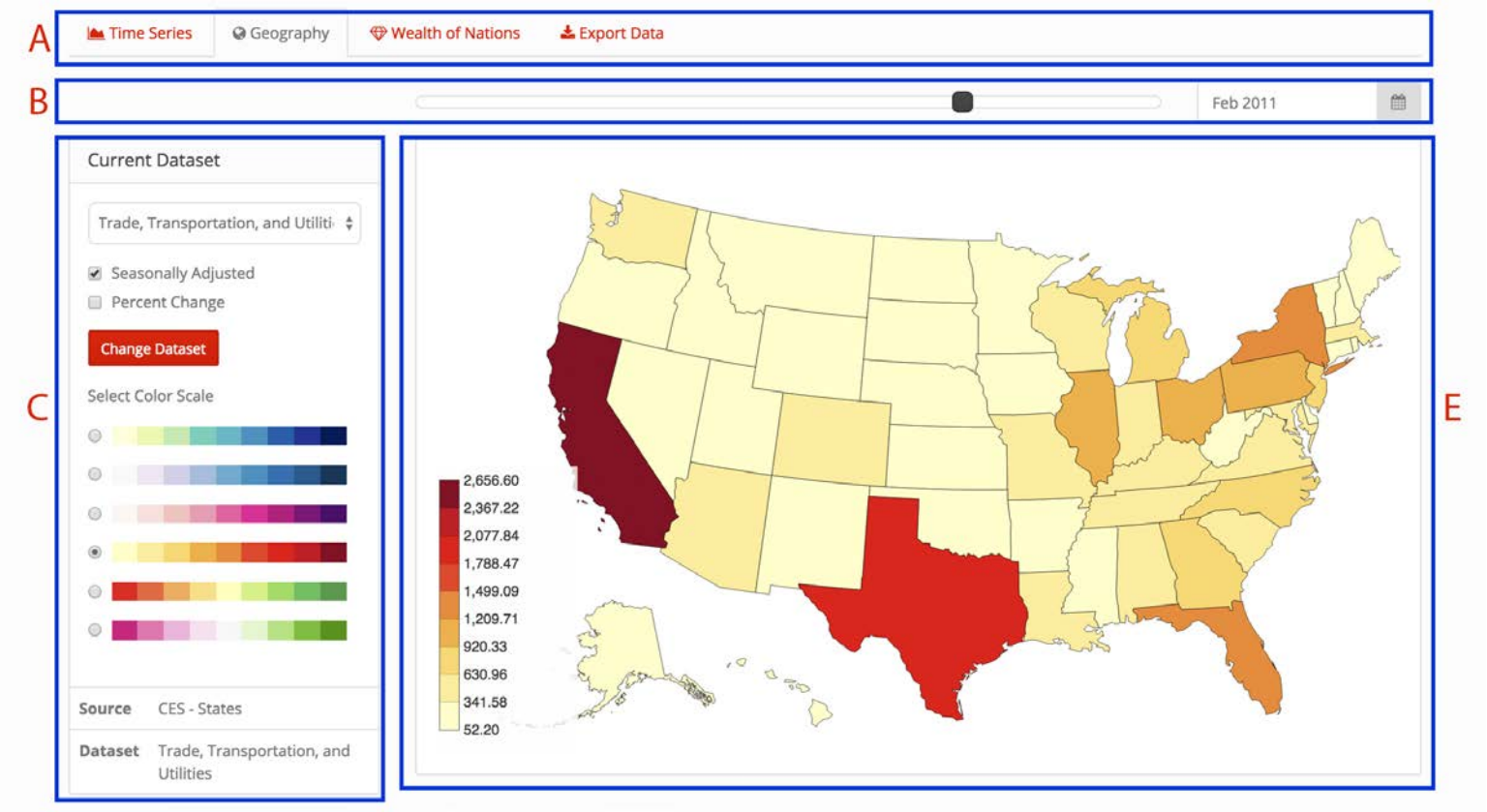
BLS API Use Case 3

- UMd's CS department built several prototypes ingesting data using the BLS API https://arxiv.org/pdf/1608.03569.pdf
  - Time Series explorer to compare and contrast multiple time series through a stacked overlay.
  - Geographic Chloropleth map to investigate changes in employment according to demographics or industry
  - BLSVisualizer to interactively navigate through the employment data, which is organized in a hierarchical format

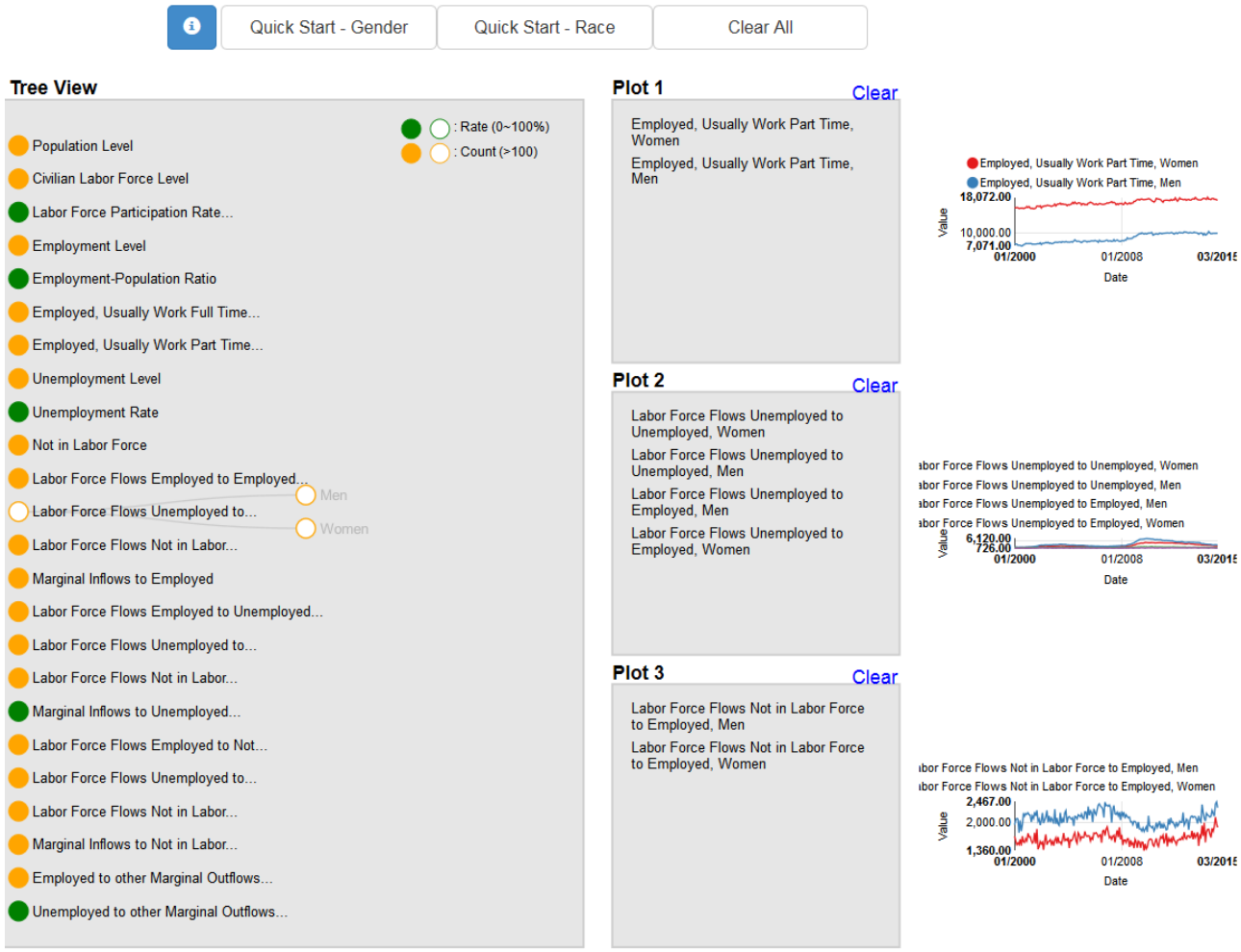
Time Series Explorer



Geographic Chloropleth Map



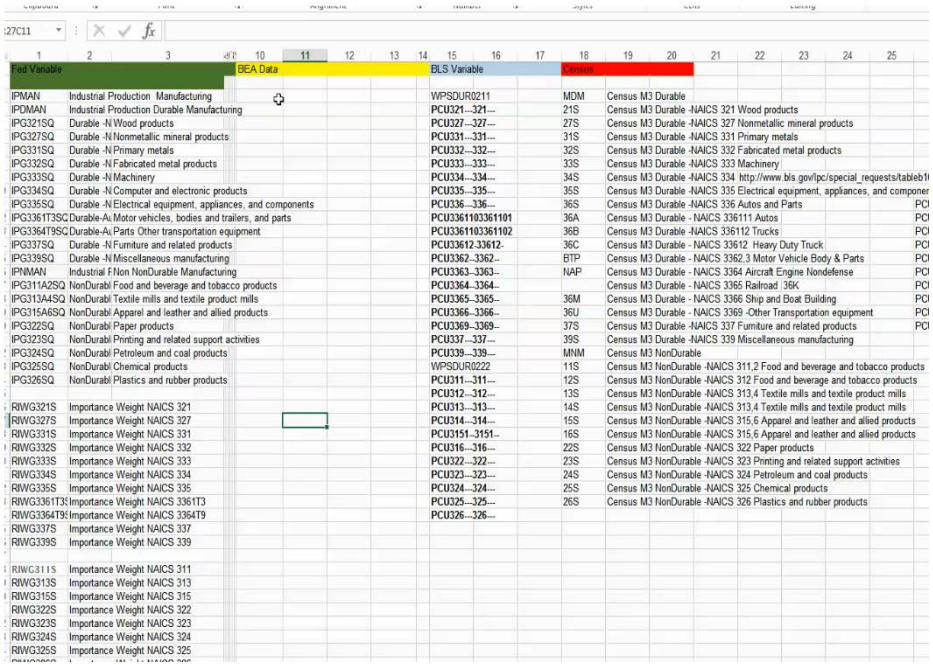
BLSVisualizer



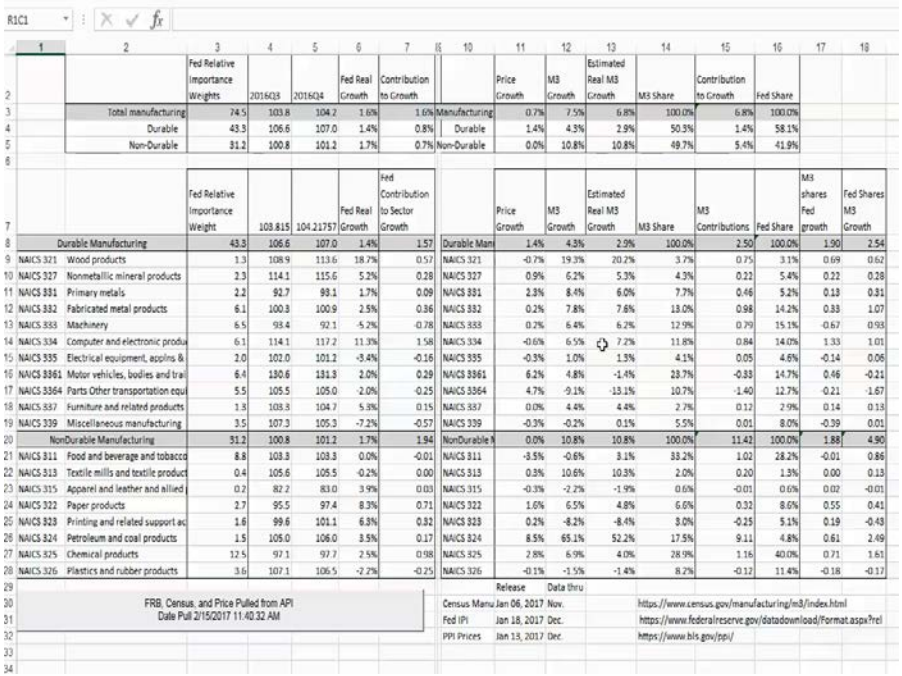
BLS API Use Case 4

- Major Sector Productivity in BLS
  - Using Excel macro to pull about 100 series from APIs - industrial production index from the Fed, sales and inventories from Census, and BLS prices to get a preliminary growth rate of manufacturing industries.
  - Helps to validate the statistics produced by the office.
  - Gives an early idea of stories to focus on to inform the public.

Excel Macro



Fed Variable		BEA Data	BLS Variable	Census
IPMAN	Industrial Production Manufacturing		WPSDUR0211	MDM Census M3 Durable
IPDMAN	Industrial Production Durable Manufacturing		PCU321--321---	21S Census M3 Durable -NAICS 321 Wood products
IPG321SQ	Durable -N Wood products		PCU327--327---	27S Census M3 Durable -NAICS 327 Nonmetallic mineral products
IPG327SQ	Durable -N Nonmetallic mineral products		PCU331--331---	31S Census M3 Durable -NAICS 331 Primary metals
IPG331SQ	Durable -N Primary metals		PCU332--332---	32S Census M3 Durable -NAICS 332 Fabricated metal products
IPG332SQ	Durable -N Fabricated metal products		PCU333--333---	33S Census M3 Durable -NAICS 333 Machinery
IPG333SQ	Durable -N Machinery		PCU334--334---	34S Census M3 Durable -NAICS 334 http://www.bls.gov/ipc/special_requests/tableb1
IPG334SQ	Durable -N Computer and electronic products		PCU335--335---	35S Census M3 Durable -NAICS 335 Electrical equipment, appliances, and componer
IPG335SQ	Durable -N Electrical equipment, appliances, and components		PCU336--336---	36S Census M3 Durable -NAICS 336 Autos and Parts PCI
IPG3361T3SQ	Durable-Au Motor vehicles, bodies and trailers, and parts		PCU3361103361101	36A Census M3 Durable - NAICS 336111 Autos PCI
IPG3364T9SQ	Durable-Au Parts Other transportation equipment		PCU3361103361102	36B Census M3 Durable - NAICS 336112 Trucks PCI
IPG337SQ	Durable -N Furniture and related products		PCU33612-33612-	36C Census M3 Durable - NAICS 33612 Heavy Duty Truck PCI
IPG339SQ	Durable -N Miscellaneous manufacturing		PCU3362--3362--	BTP Census M3 Durable - NAICS 3362,3 Motor Vehicle Body & Parts PCI
IPMAN	Industrial P Non NonDurable Manufacturing		PCU3363--3363--	NAP Census M3 Durable - NAICS 3364 Aircraft Engine Nondefense PCI
IPG311A2SQ	NonDurabl Food and beverage and tobacco products		PCU3364--3364--	Census M3 Durable - NAICS 3365 Railroad 36K PCI
IPG313A4SQ	NonDurabl Textile mills and textile product mills		PCU3365--3365--	36M Census M3 Durable - NAICS 3366 Ship and Boat Building PCI
IPG315A6SQ	NonDurabl Apparel and leather and allied products		PCU3366--3366--	36U Census M3 Durable - NAICS 3369 -Other Transportation equipment PCI
IPG322SQ	NonDurabl Paper products		PCU3369--3369--	37S Census M3 Durable -NAICS 337 Furniture and related products PCI
IPG323SQ	NonDurabl Printing and related support activities		PCU337--337---	39S Census M3 Durable -NAICS 339 Miscellaneous manufacturing
IPG324SQ	NonDurabl Petroleum and coal products		PCU339--339---	MNM Census M3 NonDurable
IPG325SQ	NonDurabl Chemical products		WPSDUR0222	11S Census M3 NonDurable -NAICS 311,2 Food and beverage and tobacco products
IPG326SQ	NonDurabl Plastics and rubber products		PCU311--311---	12S Census M3 NonDurable -NAICS 312 Food and beverage and tobacco products
			PCU312--312---	13S Census M3 NonDurable -NAICS 313,4 Textile mills and textile product mills
RIWG321S	Importance Weight NAICS 321		PCU313--313---	14S Census M3 NonDurable -NAICS 313,4 Textile mills and textile product mills
RIWG327S	Importance Weight NAICS 327		PCU314--314---	15S Census M3 NonDurable -NAICS 315,6 Apparel and leather and allied products
RIWG331S	Importance Weight NAICS 331		PCU3151--3151--	16S Census M3 NonDurable -NAICS 315,6 Apparel and leather and allied products
RIWG332S	Importance Weight NAICS 332		PCU316--316---	22S Census M3 NonDurable -NAICS 322 Paper products
RIWG333S	Importance Weight NAICS 333		PCU322--322---	23S Census M3 NonDurable -NAICS 323 Printing and related support activities
RIWG334S	Importance Weight NAICS 334		PCU323--323---	24S Census M3 NonDurable -NAICS 324 Petroleum and coal products
RIWG335S	Importance Weight NAICS 335		PCU324--324---	25S Census M3 NonDurable -NAICS 325 Chemical products
RIWG3361T3	Importance Weight NAICS 3361T3		PCU325--325---	26S Census M3 NonDurable -NAICS 326 Plastics and rubber products
RIWG3364T9	Importance Weight NAICS 3364T9		PCU326--326---	
RIWG337S	Importance Weight NAICS 337			
RIWG339S	Importance Weight NAICS 339			
RIWG311S	Importance Weight NAICS 311			
RIWG313S	Importance Weight NAICS 313			
RIWG315S	Importance Weight NAICS 315			
RIWG322S	Importance Weight NAICS 322			
RIWG323S	Importance Weight NAICS 323			
RIWG324S	Importance Weight NAICS 324			
RIWG325S	Importance Weight NAICS 325			



	Fed Relative Importance Weights	2016Q3	2016Q4	Fed Real Growth	Contribution to Growth
Total manufacturing	74.5	103.8	104.2	1.6%	1.6%
Durable	43.3	106.6	107.0	1.4%	0.8%
Non-Durable	31.2	100.8	101.2	1.7%	0.7%

	Fed Relative Importance Weight	108.815	104.21757	Fed Real Growth	Fed Contribution to Sector Growth
Durable Manufacturing	43.3	106.6	107.0	1.4%	1.57
NAICS 321 Wood products	1.3	108.9	113.6	18.7%	0.57
NAICS 327 Nonmetallic mineral products	2.3	114.1	115.6	5.2%	0.28
NAICS 331 Primary metals	2.2	92.7	93.1	1.7%	0.09
NAICS 332 Fabricated metal products	6.1	100.3	100.9	2.5%	0.36
NAICS 333 Machinery	6.5	93.4	92.1	-5.2%	-0.78
NAICS 334 Computer and electronic produ	6.1	114.1	117.2	11.3%	1.58
NAICS 335 Electrical equipment, applns &	2.0	102.0	101.2	-3.4%	-0.16
NAICS 3361 Motor vehicles, bodies and trai	6.4	130.6	131.3	2.0%	0.29
NAICS 3364 Parts Other transportation equ	5.5	105.5	105.0	2.0%	0.25
NAICS 337 Furniture and related products	1.3	103.3	104.7	5.3%	0.15
NAICS 339 Miscellaneous manufacturing	3.5	107.3	105.3	-7.2%	-0.57
NonDurable Manufacturing	31.2	100.8	101.2	1.7%	1.94
NAICS 311 Food and beverage and tobacco	8.8	103.3	103.3	0.0%	-0.01
NAICS 313 Textile mills and textile product	0.4	105.6	105.5	-0.2%	0.00
NAICS 315 Apparel and leather and allied	0.2	82.2	83.0	3.9%	0.03
NAICS 322 Paper products	2.7	95.5	97.4	8.3%	0.71
NAICS 323 Printing and related support ac	1.6	99.6	101.1	6.3%	0.32
NAICS 324 Petroleum and coal products	1.5	105.0	106.0	3.5%	0.17
NAICS 325 Chemical products	12.5	97.1	97.7	2.5%	0.98
NAICS 326 Plastics and rubber products	3.6	107.1	106.5	-2.2%	-0.25

	Price Growth	M3 Growth	Estimated Real M3 Growth	M3 Share	Contribution to Growth	Fed Share
Manufacturing	0.7%	7.5%	6.8%	100.0%	6.8%	100.0%
Durable	1.4%	4.3%	2.9%	50.3%	1.4%	58.1%
Non-Durable	0.0%	10.8%	10.8%	49.7%	5.4%	41.9%

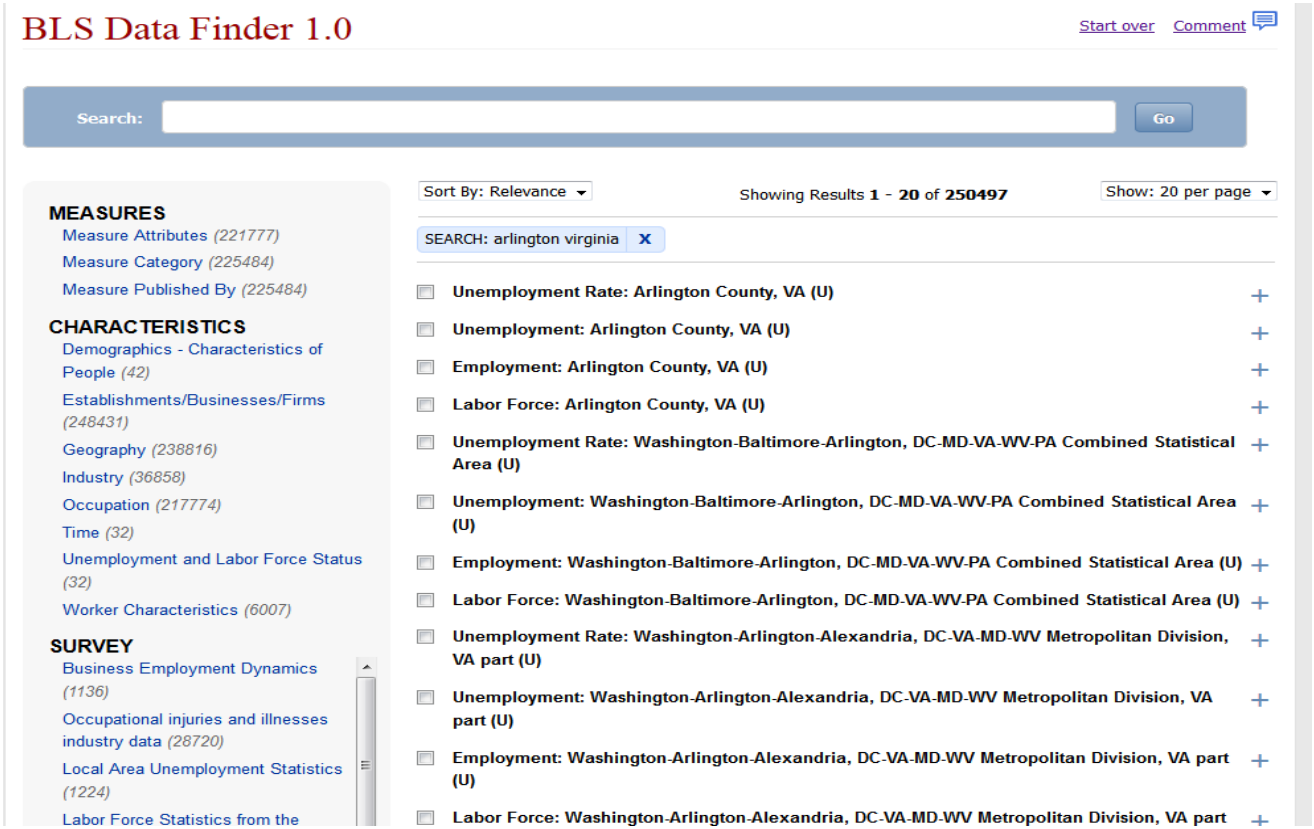
	Price Growth	M3 Growth	Estimated Real M3 Growth	M3 Share	M3 Contributions	Fed Share	M3 shares Fed growth	Fed Shares M3 Growth
Durable Manu	1.4%	4.3%	2.9%	100.0%	2.50	100.0%	1.90	2.54
NAICS 321	-0.7%	19.3%	20.2%	3.7%	0.75	3.1%	0.69	0.62
NAICS 327	0.9%	6.2%	5.3%	4.3%	0.22	5.4%	0.22	0.28
NAICS 331	2.3%	8.4%	6.0%	7.7%	0.46	5.2%	0.13	0.31
NAICS 332	0.2%	7.8%	7.6%	13.0%	0.98	14.2%	0.33	1.07
NAICS 333	0.2%	6.4%	6.2%	12.9%	0.79	15.1%	-0.67	0.93
NAICS 334	-0.6%	6.5%	7.2%	11.8%	0.84	14.0%	1.33	1.01
NAICS 335	-0.3%	1.0%	1.3%	4.1%	0.05	4.6%	-0.14	0.06
NAICS 3361	6.2%	4.8%	-1.4%	28.7%	-0.33	14.7%	0.46	-0.21
NAICS 3364	4.7%	-9.1%	-13.1%	10.7%	-1.40	12.7%	-0.21	-1.67
NAICS 337	0.0%	4.4%	4.4%	2.7%	0.12	2.9%	0.14	0.13
NAICS 339	-0.3%	-0.2%	0.1%	5.5%	0.01	8.0%	-0.39	0.01
NonDurable M	0.0%	10.8%	10.8%	100.0%	11.42	100.0%	1.88	4.90
NAICS 311	-3.5%	-0.6%	3.1%	38.2%	1.02	28.2%	-0.01	0.86
NAICS 313	0.3%	10.6%	10.3%	2.0%	0.20	1.3%	0.00	0.13
NAICS 315	-0.3%	-2.2%	-1.9%	0.6%	-0.01	0.6%	0.02	-0.01
NAICS 322	1.6%	6.5%	4.8%	6.6%	0.32	8.6%	0.55	0.41
NAICS 323	0.2%	-8.2%	-8.4%	3.0%	-0.25	5.1%	0.19	-0.43
NAICS 324	8.5%	65.1%	52.2%	17.5%	9.11	4.8%	0.61	2.49
NAICS 325	2.8%	6.9%	4.0%	28.9%	1.16	40.0%	0.71	1.61
NAICS 326	-0.1%	-1.5%	-1.4%	8.2%	-0.12	11.4%	-0.18	-0.17

	Release	Data thru	
Census Manu	Jan 06, 2017	Nov.	https://www.census.gov/manufacturing/m3/index.html
Fed IPI	Jan 18, 2017	Dec.	https://www.federalreserve.gov/datadownload/Format.aspx?rel
PPI Prices	Jan 13, 2017	Dec.	https://www.bls.gov/ppi/

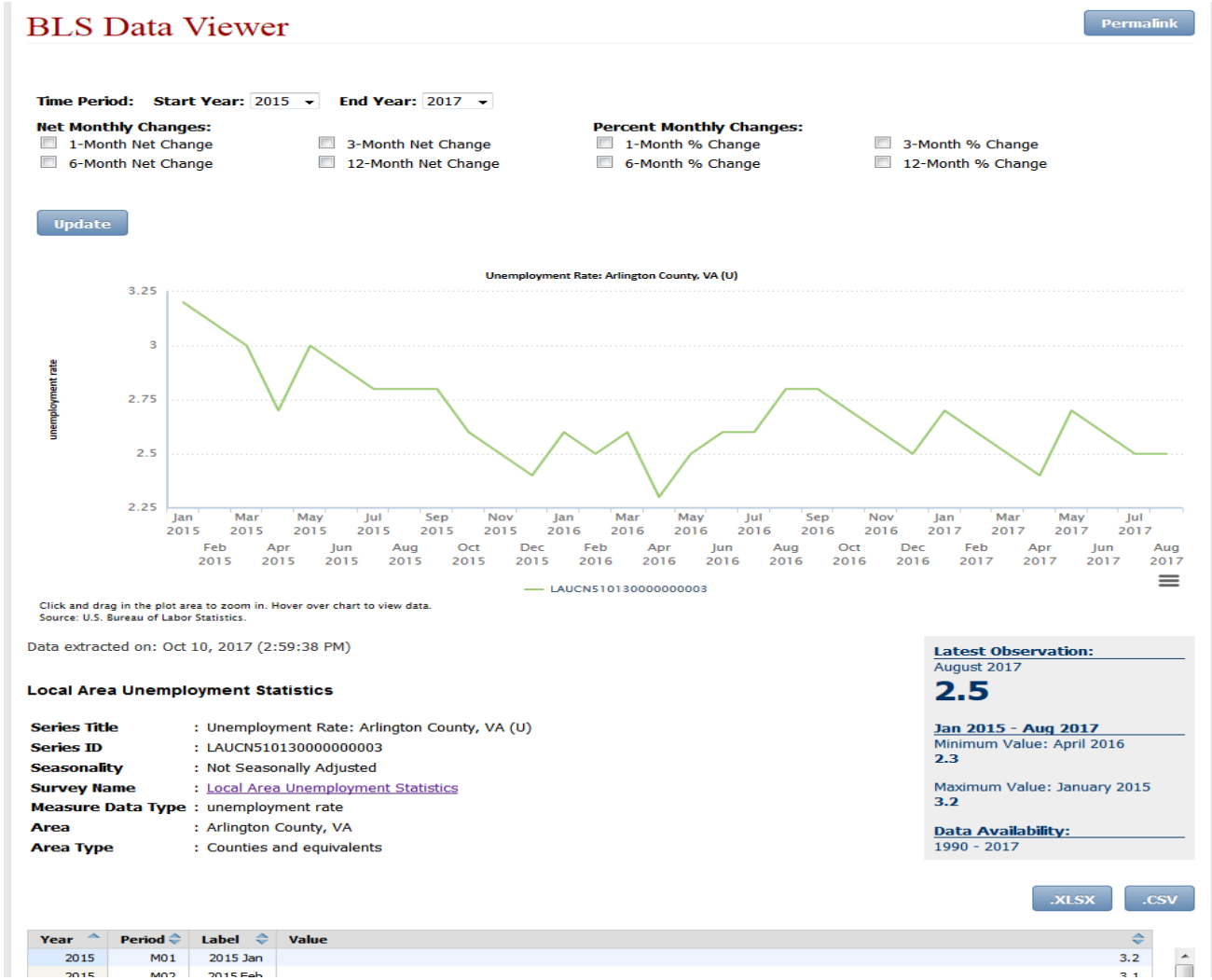
FRB, Census, and Price Pulled from API
Date Pull 2/15/2017 11:40.32 AM

BLS API Use Case 5

- BLS DataFinder (text based time series search tool)
  - Extracts time series details using API.



BLS DataFinder



Resources

- API Getting Started Page
  - https://www.bls.gov/developers
  - Documentation of API signatures (parameters)
    - Sample Code: Java, Python, PHP, R, SAS, MATLAB, etc…
    - FAQs

Request a Single Series

- Requesting data about a single time series: LAUCN040010000000005 (Employment: Apache County, AZ)

https://api.bls.gov/publicAPI/v2/timeseries/data/LAUCN040010000000005

Single Series Results


```
{ "status":"REQUEST_SUCCEEDED", "responseTime":34, "message":[],
   "Results": {
      "series":  [{
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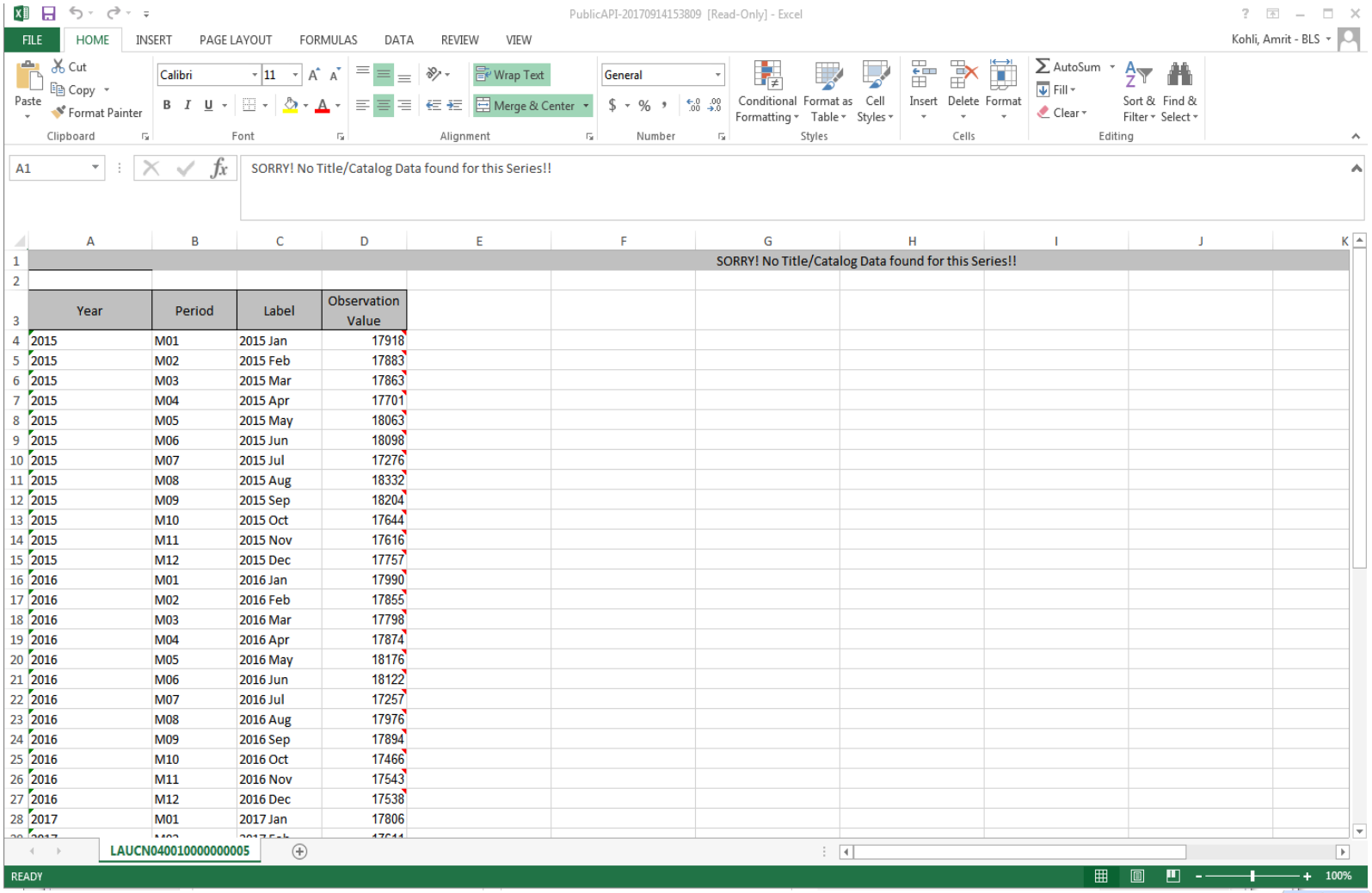
        "data":[
           {"year":"2017",
           "period":"M07",
           "periodName":“July",
           "value":"17216",
           "footnotes":[
              {"code":“P",
                "text":“Preliminary.“
           }]},
          {"year":"2017",
           "period":"M06",
           "periodName":“June",
           "value":"17728",
           "footnotes":[{}]},
...
```

Request Excel Output

- Requesting data about a single time series: LAUCN040010000000005 (Employment: Apache County, AZ)

https://api.bls.gov/publicAPI/v2/timeseries/data/LAUCN040010000000005.xlsx

Excel Results



PublicAPI-20170914153809 [Read-Only] - Excel

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A1: SORRY! No Title/Catalog Data found for this Series!!

	A	B	C	D
1	SORRY! No Title/Catalog Data found for this Series!!			
2				
3	Year	Period	Label	Observation Value
4	2015	M01	2015 Jan	17918
5	2015	M02	2015 Feb	17883
6	2015	M03	2015 Mar	17863
7	2015	M04	2015 Apr	17701
8	2015	M05	2015 May	18063
9	2015	M06	2015 Jun	18098
10	2015	M07	2015 Jul	17276
11	2015	M08	2015 Aug	18332
12	2015	M09	2015 Sep	18204
13	2015	M10	2015 Oct	17644
14	2015	M11	2015 Nov	17616
15	2015	M12	2015 Dec	17757
16	2016	M01	2016 Jan	17990
17	2016	M02	2016 Feb	17855
18	2016	M03	2016 Mar	17798
19	2016	M04	2016 Apr	17874
20	2016	M05	2016 May	18176
21	2016	M06	2016 Jun	18122
22	2016	M07	2016 Jul	17257
23	2016	M08	2016 Aug	17976
24	2016	M09	2016 Sep	17894
25	2016	M10	2016 Oct	17466
26	2016	M11	2016 Nov	17543
27	2016	M12	2016 Dec	17538
28	2017	M01	2017 Jan	17806

LAUCN040010000000005

READY

Request Catalog Metadata

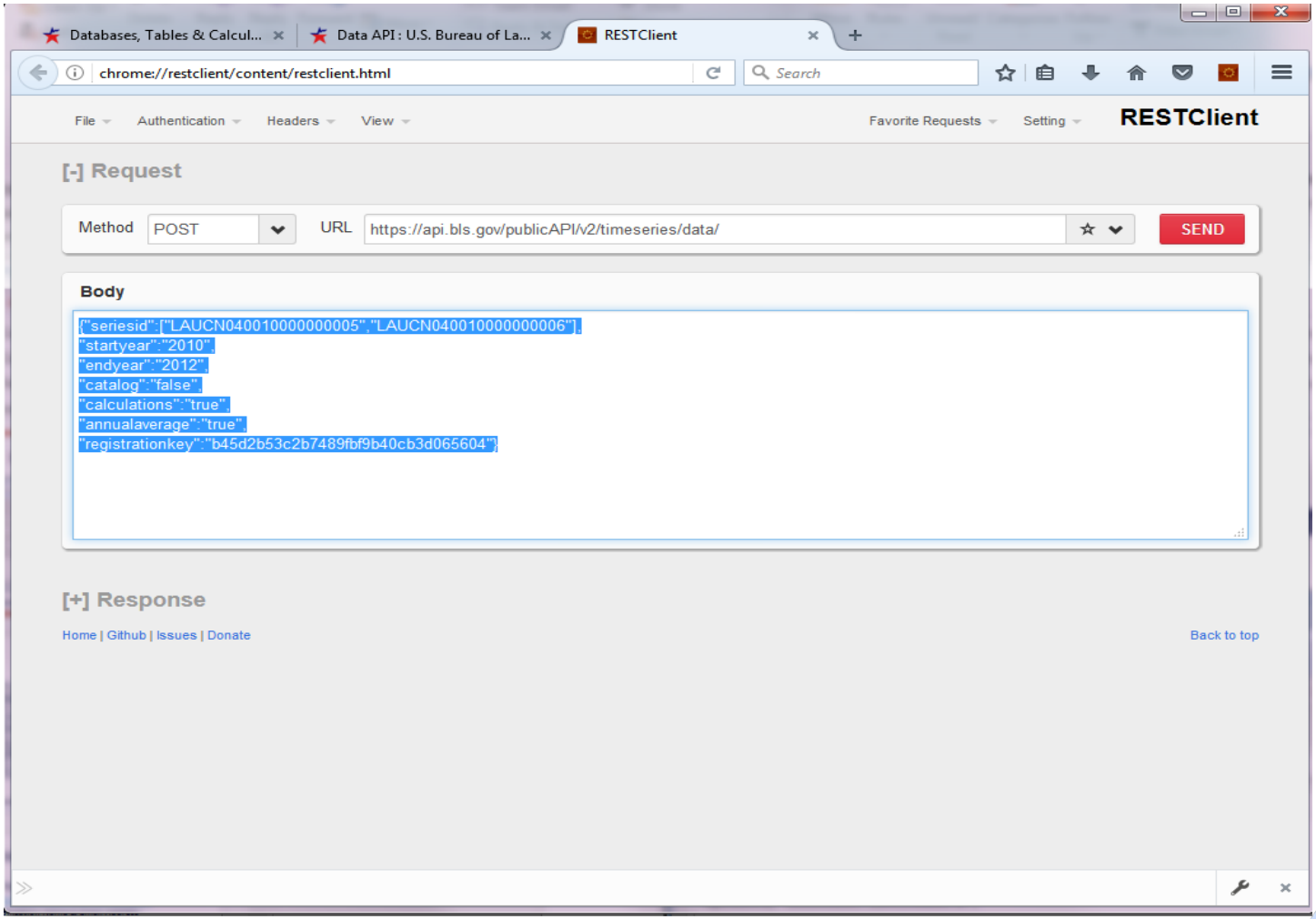
- Requesting data about a single time series for a given year, including metadata: LAUCN040010000000005 (Employment: Apache County, AZ)

https://api.bls.gov/publicAPI/v2/timeseries/data/LAUCN040010000000005?registrationKey=000f4e000f204473bb565256e8eee73e&catalog=true&startYear=2010&endYear=2010

Catalog Results


```
{ "status":"REQUEST_SUCCEEDED", "responseTime":55, "message":[],
  "Results": {
    "series":  [{
      "seriesID":"LAUCN040010000000005",
      "catalog":{
        "series_title":"Employment: Apache County, AZ (U)",
        "series_id":"LAUCN040010000000005",
        "seasonality":"Not Seasonally Adjusted",
        "survey_name":"Local Area Unemployment Statistics",
        "measure_data_type":"employment",
        "area":"Apache County, AZ",
        "area_type":"Counties and equivalents“
      }
      "data":[
        {"year":"2010",
        "period":"M12",
        "periodName":"December",
        "value":"19170",
        "footnotes":[
          {"code":"R",
           "text":"Data were subject to revision on April 15, 2016.“
        }]},
....
```

Request Calculations



Net and Percent Changes


```
"data": [
   {"year": "2010",
    "period": "M13",
    "periodName": "Annual",
    "value": "23438",
    "footnotes":  [{
        "code": "R",
        "text": "Data were subject to revision on April 15, 2016."}],
   "calculations": {
      "net_changes": {
        "1": "747",
        "3": "413",
        "6": "-632",
        "12": "500“ },
       "pct_changes": {
        “1": "3.3",
        "3": "1.8",
        "6": "-2.6",
        "12": "2.2"}
       }
}
```

API: Lessons Learned

- Performance, Scaling and Caching
- Limiting and Throttling (victim of its own success)
- Usability (documentation, output & input formats)
- Providing tiered-technical support to your users (Why doesn't my code work?)

Questions for the DUAC

- How many DUAC members use or have tried to use the BLS Data API? Use other agencies API? Which agencies?

- One of the prerequisites to effectively use the BLS Data API is to know the BLS series identifiers (Series IDs). How do or did you discover the Series IDs to use for the API?

Questions for the DUAC

- Are the current daily API use limitations reasonable?

	Registered	Unregistered
Daily query limit	500	25
Series per query limit	50	25
Years per query limit	20	10

Questions for the DUAC

- Is the API documentation sufficient—any gaps that would greatly help or would helped in your use of the API?

- From your experience of using other agencies API's, what key feature made it easier to use that you'd like to see in the BLS Data API?

Questions for the DUAC

- We implemented human friendly features (e.g., XLSX file) into the API as Chrome and Firefox browsers allow GET and POST calls using add-ons. Should we develop more such features or primarily focus to improve automated systems interactions (machine to machine) with the API?

Contact Information

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