Manufacturing and Automation

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Agenda

- ➔ Assumptions
- ➔ Hypothesis
- ➔ Considered Factors
- ➔ Data
- ➔ Results
- ➔ Insights
- ➔ Sources

What people are assuming?

Politicians Across the political spectrum have appealed to the idea that manufacturing jobs are going to China

Twitter

Hypothesis

Our hypothesis is that, contrary to current assumptions, manufacturing output in this country is not decreasing though employment in manufacturing is, which indicates that the jobs are not primarily being outsourced to China or India, they're being automated.

Considered Factors

What we looked at:

- ➔ Real Manufacturing Output

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- ➔ Industrial Production

- ➔ The Number of Manufacturing Jobs

- ➔ Percent of Employment in Manufacturing

Where did we get our data from?

Federal Reserve Bank of St. Louis

1. Percent Employment in Manufacturing: https://fred.stlouisfed.org/series/USAPEFANA
2. Manufacturing Jobs (Total): https://fred.stlouisfed.org/series/MANEMP
3. Manufacturing Output: https://fred.stlouisfed.org/series/OUTMS
4. Industrial Production: https://fred.stlouisfed.org/series/INDPRO

How did we clean our data?

➔ **Cropping for the Timeline**

Some of the data stretched back to the early twentieth century. In order to compare all the data on the same timeline

➔ **Getting Rid of Documentation**

The Fed files include documentation we had to remove.

➔ **Compiling the Data into a single CSV**

We compiled the data into one CSV file for easy uploading to Tableau etc.

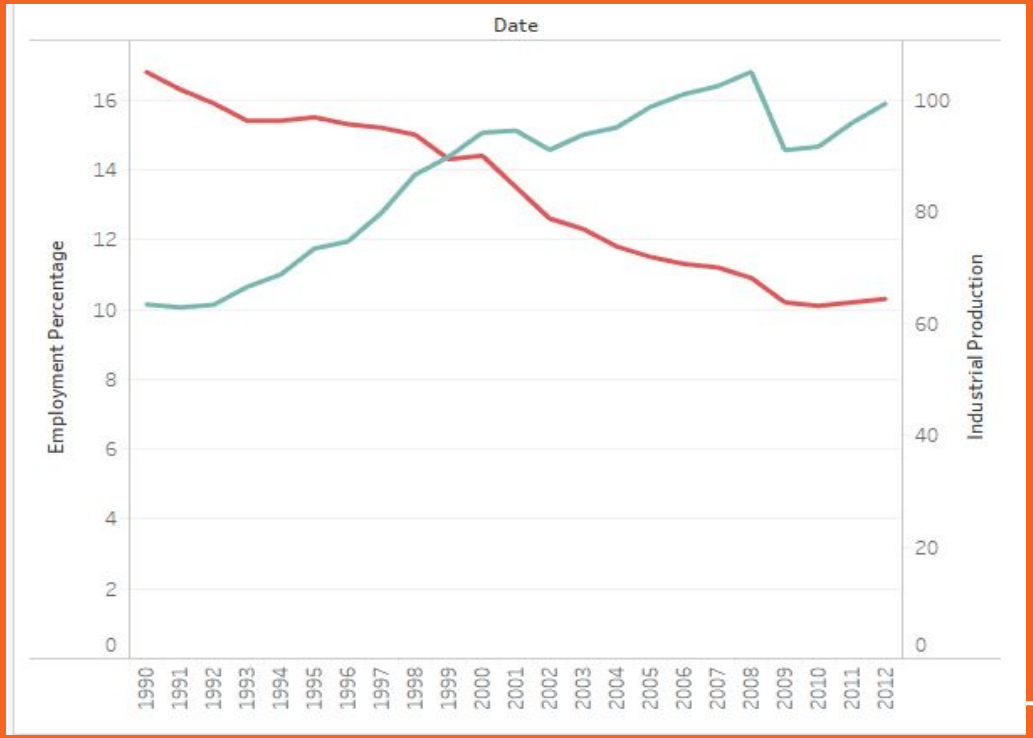
Cleaned Data

Date	IndProd	OUTMS	MANJOBS	percentjobs
1990-01-01	63.4228	68.206	17797	16.8
1991-01-01	62.8852	65.950	17330	16.3
1992-01-01	63.3374	68.525	16839	15.9
1993-01-01	66.5643	72.356	16791	15.4
1994-01-01	68.7648	74.575	16855	15.4
1995-01-01	73.4219	79.500	17262	15.5
1996-01-01	74.6841	80.886	17208	15.3
1997-01-01	79.8273	86.637	17297	15.2
1998-01-01	86.6474	92.525	17619	15.0
1999-01-01	89.8594	95.468	17427	14.3
2000-01-01	94.1758	99.137	17284	14.4
2001-01-01	94.5448	97.406	17104	13.5
2002-01-01	91.0794	94.347	15587	12.6
2003-01-01	93.8198	96.643	14866	12.3
2004-01-01	95.1085	97.595	14290	11.8
2005-01-01	98.7845	102.101	14257	11.5
2006-01-01	101.0627	104.229	14210	11.3
2007-01-01	102.4933	106.147	14008	11.2
2008-01-01	105.0619	107.338	13725	10.9
2009-01-01	91.0373	90.577	12561	10.2
2010-01-01	91.6642	93.923	11460	10.1
2011-01-01	95.9364	98.408	11621	10.2
2012-01-01	99.3925	100.075	11838	10.3

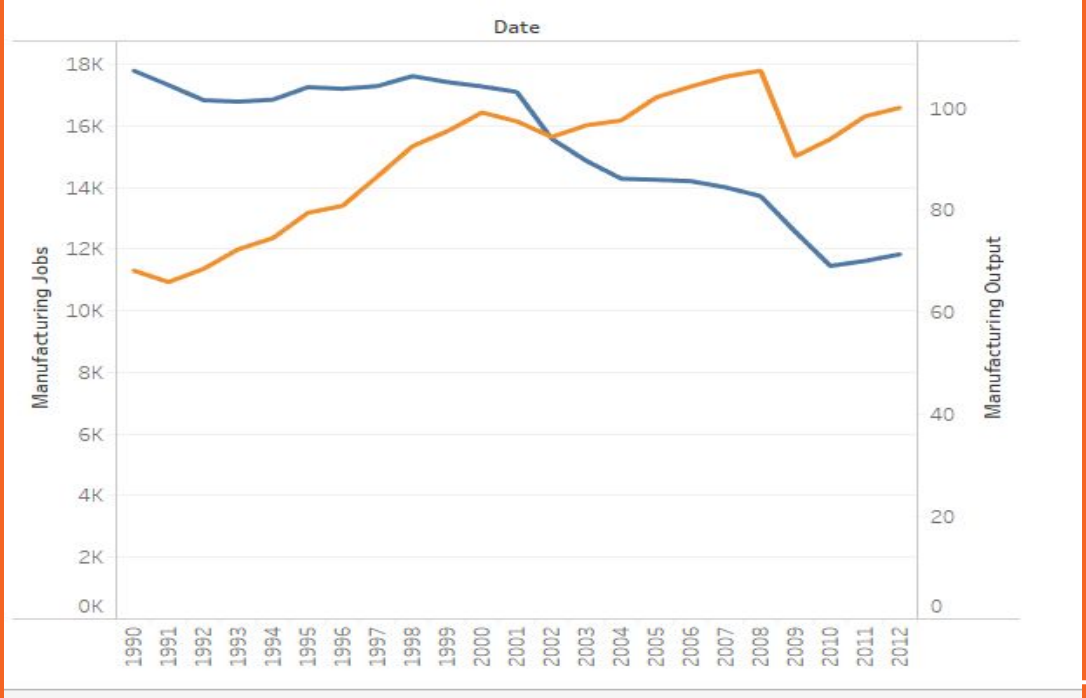
Was our hypothesis correct?



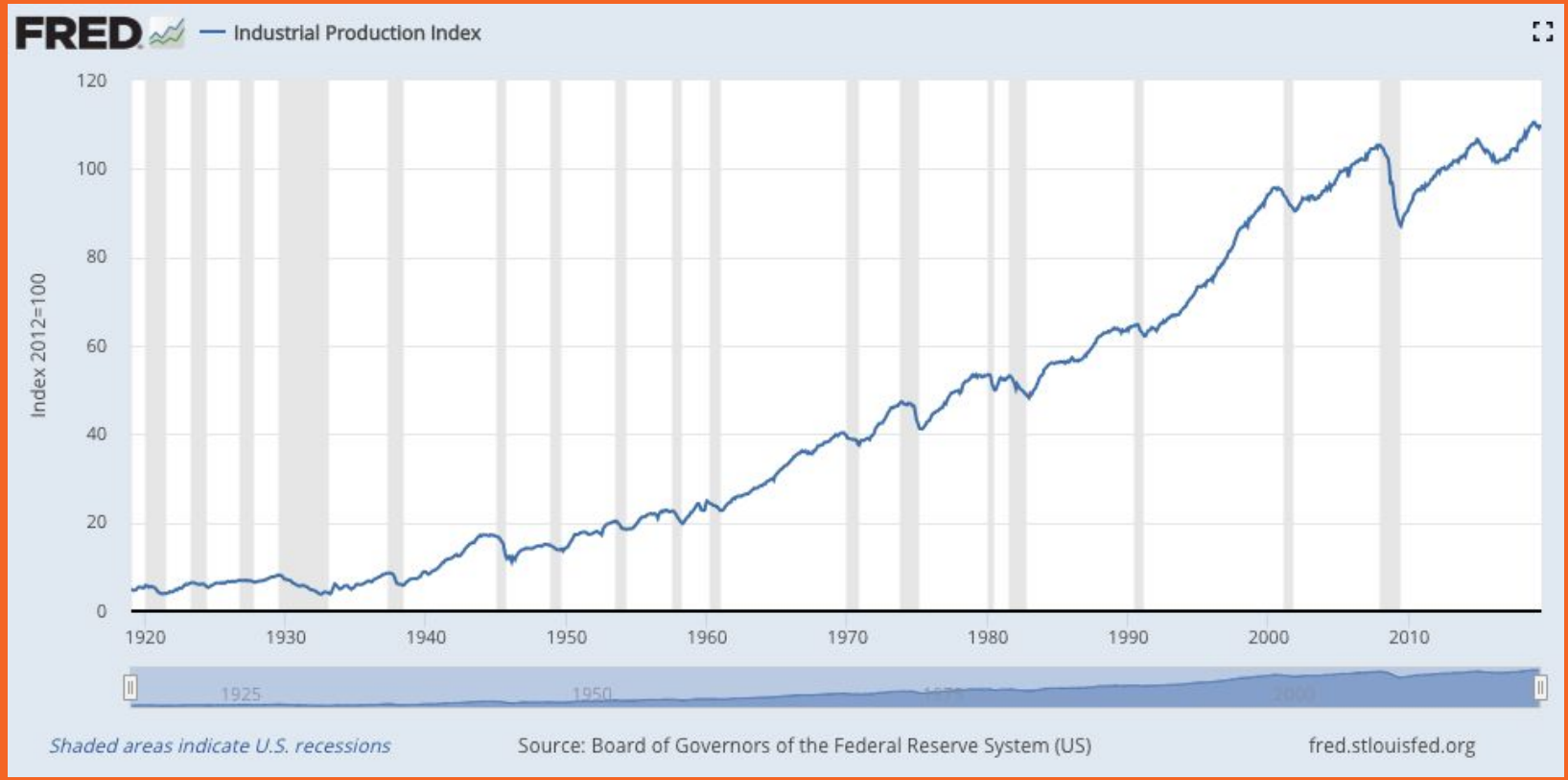
Results: Employment vs Production

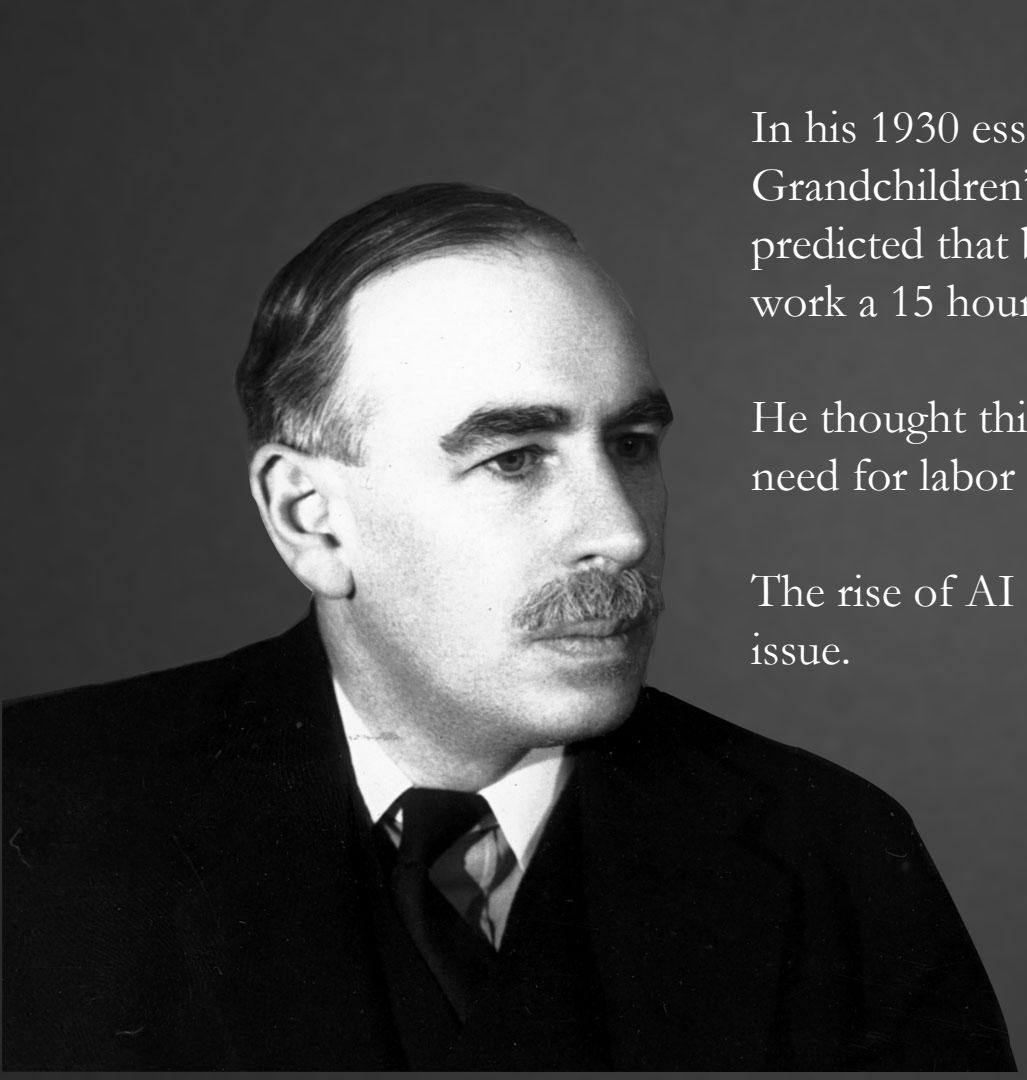


Results: Jobs vs Output



Data From Before 1990





In his 1930 essay “Economic Possibilities for our Grandchildren”, the economist John Maynard Keynes predicted that by sometime between 2000 and 2030 we would work a 15 hour work week.

He thought this would be a consequence of the diminishing need for labor brought on by automation.

The rise of AI automation has made people re approach the issue.

Actionable Insights from the Data

- Profound implications for policy decisions and the evolution of job markets.
  Might motivate:
  - The institution of some kind universal basic income.
  - The reduction of hours considered for full-time employment.
  - A VAT Tax on certain technologies.
- This quote from a 2016 White House Report demonstrates the gravity of the situation:
  - “In theory, AI-driven automation might involve more than temporary disruptions in labor markets and drastically reduce the need for workers. If there is no need for extensive human labor in the production process, society as a whole may need to find an alternative approach to resource allocation other than compensation for labor, requiring a fundamental shift in the way economies are organized.” - 2016 White House Report

Sources:

Data Sets:

1. https://fred.stlouisfed.org/series/USAPEFANA
2. https://fred.stlouisfed.org/series/MANEMP
3. https://fred.stlouisfed.org/series/OUTMS
4. https://fred.stlouisfed.org/series/INDPRO

Supplemental Sources:

- https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/Artificial-Intelligence-Automation-Economy.PDF
- http://www.econ.yale.edu/smith/econ116a/keynes1.pdf
- https://www.youtube.com/watch?v=QbTWxFwuQtM

GitHub:

- https://github.com/riyazhdholakia/FedDataAutomationAnalysis