The Loose Concept of Labor-Market Slack

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the Federal Reserve Bank of Chicago or the Federal Reserve System.
Four things about labor-market “slack” that I will cover

A Brief History of “Slack”
- Unemployment-inflation “menu” interpretation
  Samuelson and Solow (1960) and Phillips (1958)

“Slack” is not a unidimensional concept
- Quantification of resource slack a dimension reduction problem

“Common” and “uncommon” movements in labor market indicators
- A host of labor-market indicators have most of their cyclical fluctuations in common

What drives current deviations from historical patterns?
- Covid recession a very peculiar mixture of shocks against the backdrop of longer-term trends in demographics and technology
A Brief History of “Slack”

Samuelson and Solow (1960) interpretation of results in Phillips (1958)
Original Phillips curve was about wage growth and unemployment

Source: Phillips (1958), annual data for the United Kingdom
Phillips curve as trade off between inflation and “slack”

![Phillips Curve Graph]

**Figure 2**

*Modified Phillips Curve for U.S.*

This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

Source: Samuelson and Solow (1960), called it a “menu” of unemployment-inflation options.
Phillips curve as trade off between inflation and “slack”

Inflationary pressures
Prices, wages, asset prices, etc.

“Slack”
(Under-) utilization of productive resources

Source: Samuelson and Solow (1960), called it a “menu” of unemployment-inflation options.

Figure 2
Modified Phillips Curve for U.S.
This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.
“Slack” not a unidimensional concept
There are many aspects of inflation and “Slack”

**Inflationary pressures**

- **Prices**
  - CPI vs PCE
  - Core vs Headline
  - Consumer, producer, and producer prices
  - Prices with different flexibility
  - ...

- **Wages**
  - Hourly wages
  - Benefits and variable pay
  - Employer cost of compensation
  - ...

- **Other**
  - Asset prices
  - Interest rates
  - Exchange rates
  - ...

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**Slack**

- **Labor**
  - Unemployment rate
  - Vacancies/job openings
  - Underutilization (U1 - U6) and participation
  - Jobs, Hours, multiple job holders, participation
  - ...

- **Capital**
  - Capacity utilization
  - Vacancy rates
  - Electricity usage
  - ...

- **Other**
  - Containers arriving at international ports
  - Delivery times for orders
  - Waiting times for services
  - ...
Unidimensionality a “Divine Coincidence”

Distortions and dimensions of slack

- **Divine Coincidence**
  
  With only one nominal rigidity, output and inflation stabilization in a simple New-Keynesian model are one and the same.  
  
  Blanchard and Gali (2007)

- **Many models with multiple distortions**
  
  - Different degrees of price rigidity
    
    Aoki (2001), Nakamura and Steinsson (2010), Eusepi et al. (2011)
  
  - Distortions along the supply chain
    
    Huang and Liu (2004), Rubbo (2023)
  
  - Real rigidities
    
    Klenow and Willis (2016), and many others
  
  - Search and matching / J2J transitions
    
    Moscarini and Postel-Vinay (2022), Dupraz et al. (2019)

- **Which distortions matter depends on shocks**
  
  What margins are distorted depends on history of shocks and endogenous response by agents and policymakers.  
  
  Ramey (2016)
Back to our "Unidimensional straightjacket"...

**Figure 2**

Modified Phillips Curve for U.S.

This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

Source: Samuelson and Solow (1960)
But we should really think of “slack” on the x-axis

Figure 2

Modified Phillips Curve for U.S.
This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

Source: Samuelson and Solow (1960)
Part of “slack” not captured by unemployment shifts the Phillips curve

![Figure 2: Modified Phillips Curve for U.S.](image)

**Figure 2**

**Modified Phillips Curve for U.S.**

This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

Source: Samuelson and Solow (1960)
Part of “slack” not captured by unemployment shifts the Phillips curve

Thus, deviations of “slack” from unemployment rate are equivalent to changes in the natural rate of unemployment.
A unique measure of “Slack” does not exist. At the end, quantification of resource slack a dimension reduction problem. Two broad approaches have been applied:

**Extract common component(s) from measures of resource (under-)utilization**

- **Pro:** Uses non- and semi-parametric methods to identify common statistical properties of a broad set of measures of resource (under-)utilization.
- **Con:** Does not directly link slack measure to inflation.

**Joint analysis of slack and inflationary pressures**

- **Pro:** Joint analyses of broad set of measures of real activity and inflation.
- **Con:** Requires very specific identifying assumptions to uncover slack that matters for Phillips curve.

Flat empirical Phillips curve due to policy response: Edge and Gürkaynak (2010), McLeay and Tenreyro (2020)
“Common” and “uncommon” movements in labor market indicators

Analysis closely related to KC Fed Labor Market Conditions Indicators and Gilchrist and Hobijn (2021)
## Explore a broad menu of cyclical labor-market indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Source</th>
<th>Procyclical</th>
<th>First month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment rate (U3)</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1960-01</td>
</tr>
<tr>
<td>Part-time for economic reasons</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1960-01</td>
</tr>
<tr>
<td>Broad unemployment rate (U6)</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1994-01</td>
</tr>
<tr>
<td>Median duration of unemployment</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1967-07</td>
</tr>
<tr>
<td>Long-term unemployed (27 weeks or more)</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1960-01</td>
</tr>
<tr>
<td>Unemployment Rate - 20 Yrs. and Over, Women</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1960-01</td>
</tr>
<tr>
<td>Unemployment Rate - Black or African American</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1972-01</td>
</tr>
<tr>
<td>Unemployment Rate - Hispanic or Latino</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1973-03</td>
</tr>
<tr>
<td>Participation Cycle</td>
<td>FRBC (based on Hobijn and Sahin (2022))</td>
<td>True</td>
<td>1978-01</td>
</tr>
<tr>
<td>Expect more jobs, net (CB)</td>
<td>Conference Board</td>
<td>True</td>
<td>1967-02</td>
</tr>
<tr>
<td>Expected job availability (U of Michigan)</td>
<td>University of Michigan</td>
<td>True</td>
<td>1978-01</td>
</tr>
<tr>
<td>Job Losers as a Percent of Total Unemployed</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1967-01</td>
</tr>
<tr>
<td>Initial claims</td>
<td>Department of Labor Employment and Training Administration</td>
<td>False</td>
<td>1967-01</td>
</tr>
<tr>
<td>Announced Job Cuts</td>
<td>Challenger, Gray, and Christmas</td>
<td>False</td>
<td>1989-03</td>
</tr>
<tr>
<td>Layoffs rate</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>2000-12</td>
</tr>
<tr>
<td>Job flows: E to U</td>
<td>Bureau of Labor Statistics</td>
<td>False</td>
<td>1990-02</td>
</tr>
<tr>
<td>Job flows: U to E</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>1990-02</td>
</tr>
<tr>
<td>Hires rate</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>2000-12</td>
</tr>
<tr>
<td>Job openings rate</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>2000-12</td>
</tr>
<tr>
<td>Manufacturing Employment Index (ISM)</td>
<td>Institute for Supply Management</td>
<td>True</td>
<td>1960-01</td>
</tr>
<tr>
<td>Services Employment Index (ISM)</td>
<td>Institute for Supply Management</td>
<td>True</td>
<td>1997-07</td>
</tr>
<tr>
<td>Percent of firms with positions not able to fill right now (NFIB)</td>
<td>National Federation of Independent Businesses</td>
<td>True</td>
<td>1973-10</td>
</tr>
<tr>
<td>Percent of firms planning to increase employment (NFIB)</td>
<td>National Federation of Independent Businesses</td>
<td>True</td>
<td>1973-10</td>
</tr>
<tr>
<td>Labor shortage (NFIB)</td>
<td>National Federation of Independent Businesses</td>
<td>True</td>
<td>1993-04</td>
</tr>
<tr>
<td>Quits rate</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>2000-12</td>
</tr>
<tr>
<td>Job leavers as a percent of the unemployed</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>1967-01</td>
</tr>
<tr>
<td>Capacity utilization</td>
<td>Federal Reserve Board of Governors</td>
<td>True</td>
<td>1967-01</td>
</tr>
<tr>
<td>Aggregate Weekly Hours (Temporary help employment (Change)</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>1991-01</td>
</tr>
<tr>
<td>EPOP ratio (Change)</td>
<td>Bureau of Labor Statistics</td>
<td>True</td>
<td>1961-01</td>
</tr>
</tbody>
</table>
First two Principal Components explain two-thirds of variation

Share of variance explained by Principal Components

Percent of variance: 1960 - Now

Level

Momentum

Author's calculations

There is a very clear business cycle in the labor market. Hooray for Burns and Mitchell (1946)!
First two Principal Components: Level and Momentum

Monthly observations; seasonally adjusted; First two Principal Components

Standard deviations (from mean)

Level and Momentum of labor-market “slack”

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Author's calculations
Covid caused major deviations from historical movements.
Unemployment rate in line with broad signal from menu of indicators

**Actual and fitted unemployment rate**
Monthly observations; seasonally adjusted; percent of labor force; fit based on first two Principal Components

![Graph showing actual and fitted unemployment rate from 1969 to 2019](image)

- Unemployment rate (U3)
- Fitted unemployment rate

Author's calculations

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But participation elevated and job openings still high and hard to fill.
What drives current deviations from historical patterns?
Covid a peculiar mixture of shocks against the backdrop of longer-term demographic and technological trends

1. **Mixture** of shocks: Covid was an unusual combination of shocks
   - Covid recession as much a relative demand shock as an aggregate demand shock
     Ferrante *et al.* (2023)

2. **Magnitude** of shocks: Covid was an unusually large shock
   - Covid recession large shock to labor market with quick rebound
     Hall and Kudlyak (2022), Hobijn (2022)

3. Recent developments mainly *continuation of pre-Covid trends*
   - Labor supply and participation
     Hobijn and Şahin (2023), Abraham and Rendell (2023)

4. Recent developments reflect *Covid-induced change in trends*
   - Shift towards (partly) working from home
     Bick *et al.* (2023), Hansen *et al.* (2023)
Let me end in true economist-fashion...

**On the one hand...**

There are more explanations than recessions

- Different shocks in different recessions trigger different margins of slack.
- Tempting to add different variables to Phillips curve specification. e.g. Ball *et al.* (2022)
- But what works now, might not work in the future. Furman and Powell III (2021)
- Non-“slack” factors explain a large part of recent inflation fluctuations. Bernanke and Blanchard (2023)

**On the other hand...**

... This makes macroeconomists hard to replace with AI!
References


