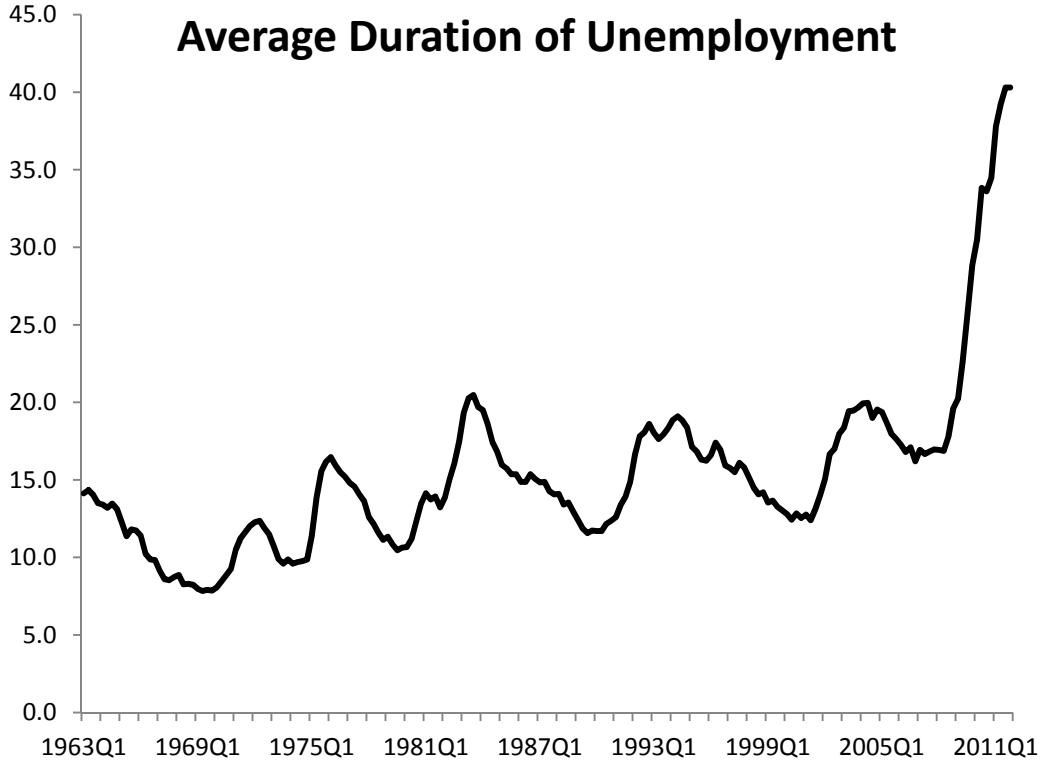
New Evidence on Cyclical and Structural Sources of Unemployment

Jinzhu Chen, Prakash Kannan, Prakash Loungani, Bharat Trehan

The Data


Unemployment Rate
12
10
8
6
4
2
0
1963Q1
1969Q1
1975Q1
1981Q1
1987Q1
1993Q1
1999Q1
2005Q1
2011Q1


Average Duration of Unemployment
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1963Q1
1969Q1
1975Q1
1981Q1
1987Q1
1993Q1
1999Q1
2005Q1
2011Q1

The Debate

"…high unemployment in America is the result of inadequate demand---full stop."

Krugman (2010)

"…firms have jobs, but can't find appropriate workers. The workers want to work, but can't find appropriate jobs."

Kocherlakota (2010)

Not the first time for this debate.

Great Britain during interwar years:

Benjamin and Kochin (1979) – high unemployment insurance payments

Loungani (1991) and Brainard (1992) – structural factors

Nason and Vahey (2006) – tax rate fluctuations

Jobless recovery after 2001 recession:

Groshen and Potter (2003) – recession marked by permanent layoffs; industries that lost (gained) jobs in recession continued to lose (gain) jobs in recovery.

Aaronson, Rissman and Sullivan (2004) – drop in temporary layoffs not important enough.

Great Recession:

Mian and Sufi (2011) – how much can be explained by drop in aggregate demand (caused by high leverage and falling home prices)? Perhaps two-thirds of employment decline

Daly, Hobijn, Sahin, Valletta (2011) – how much could the natural rate have changed? Preferred estimate is 1 percentage point

What does the matching function tell us?

Sahin, Song, Topa and Violante (2011) -- labor market mismatch (mostly industrial or occupational) accounts for between 0.6 and 1.7 percentage points of increase in unemployment through 2009

Barnichon and Figura (2011) -- decline in aggregate matching efficiency added 1 ½ percentage points to unemployment rate; increased dispersion in labor market conditions was unusually important

Sectoral Shocks and Reallocation

Over time, shocks to preferences or technology will make it necessary to shift resources across sectors of the economy. This is likely to be a long and costly process.

Lilien (1982) argues that workers may have strong attachments because of industry-specific skills and wage premiums associated with seniority.

Search models suggest other reasons. In Phelan and Trejos (2000) reallocation is slow because the cost of creating a job is higher in the expanding sector.

Costs of reallocation are often measured in terms of what happens to the unemployment rate.

Some other estimates:

Lee and Wolpin (2006): direct cost of intersectoral move is 50 to 75 percent of individual's annual earnings.

Ramey and Shapiro (2001): Firms recover just 28% of replacement cost of capital sold during sectoral downturn. (Aerospace in the 1990s)

Measuring Sectoral Shocks

Hard to get simple measures of sectoral shocks:

- Industry profitability affected by mostly unobservable shocks to technology and preferences (Barro, 1986)
- Allocative disturbances from any particular source likely occur infrequently (Davis, 1985)

Lilien (1982) constructed a dispersion measure based on sectoral employment data and showed it helped predict unemployment.

Abraham and Katz (1986) argued aggregate shocks likely to affect industries differently and to cause employment dispersion.

Loungani, Rush and Tave (1990) and Brainard and Cutler (1993) use data on stock prices to circumvent these problems.

An example:

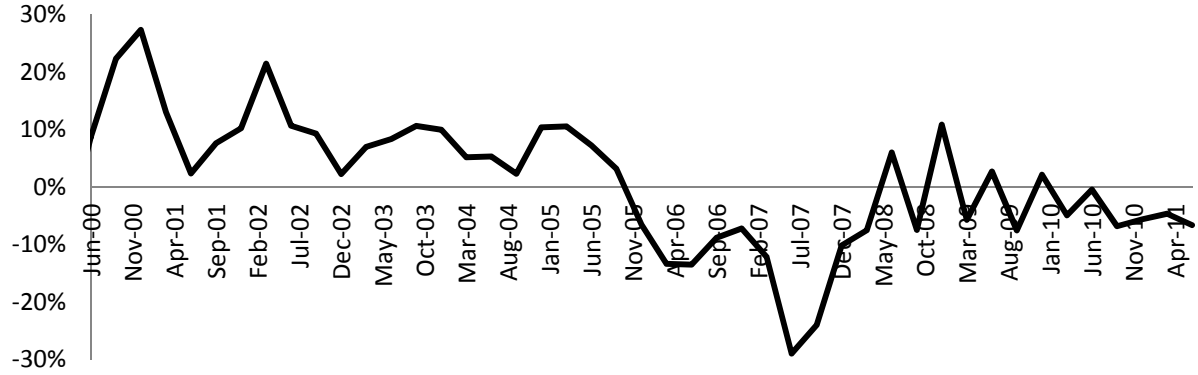
Adverse news about long run prospects of industry will push down its stock price, as investors anticipate hard times (Fischer Black, 1982, Beaudry and Portier, 2004).

Over time, industry sheds resources, requiring (both capital and) labor to move.

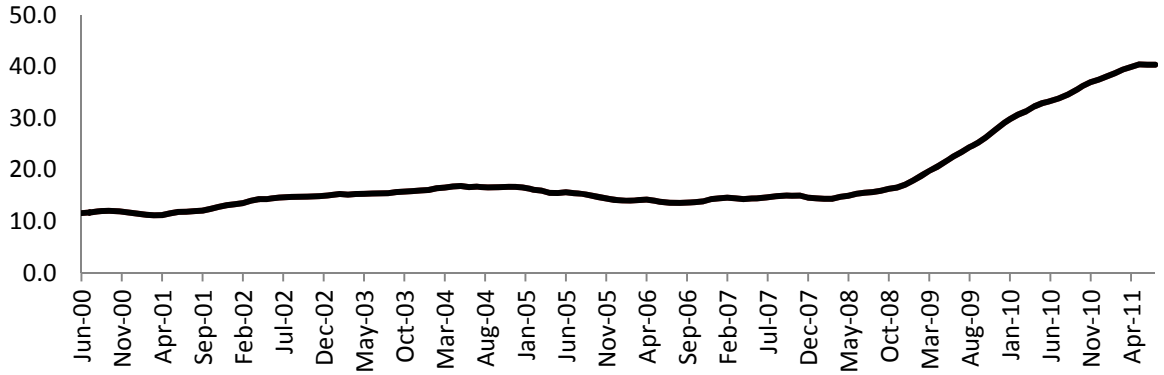
Displaced workers have to move to other industries, so they are likely to remain unemployed longer and the unemployment rate should go up.

Excess Returns and Unemployment Duration - I

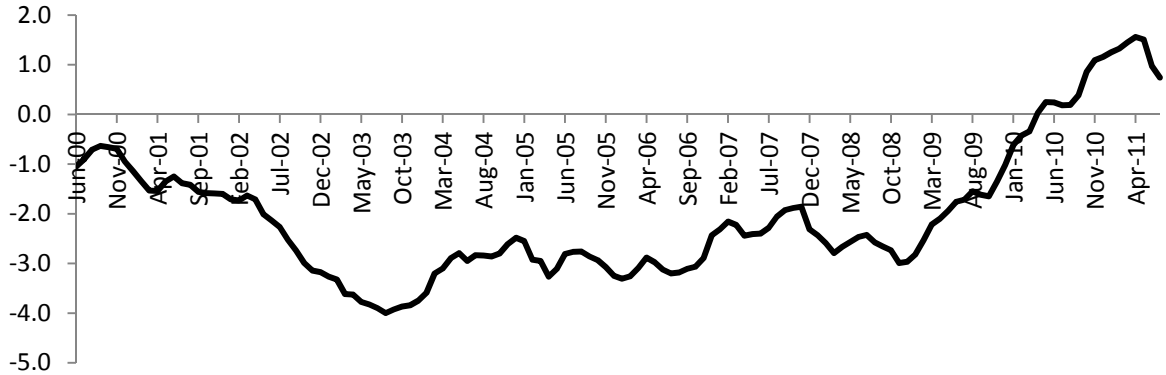
Excess Returns - Homebuilders
3-Quarter Centered Moving Average



Average Duration of Unemployment : Construction
12-month Centered Moving Average

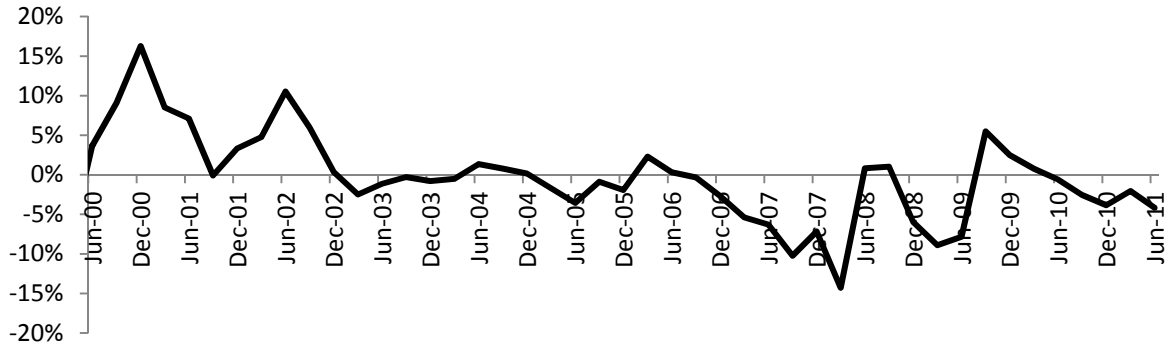


Relative Duration of Unemployment : Construction
12-month Centered Moving Average

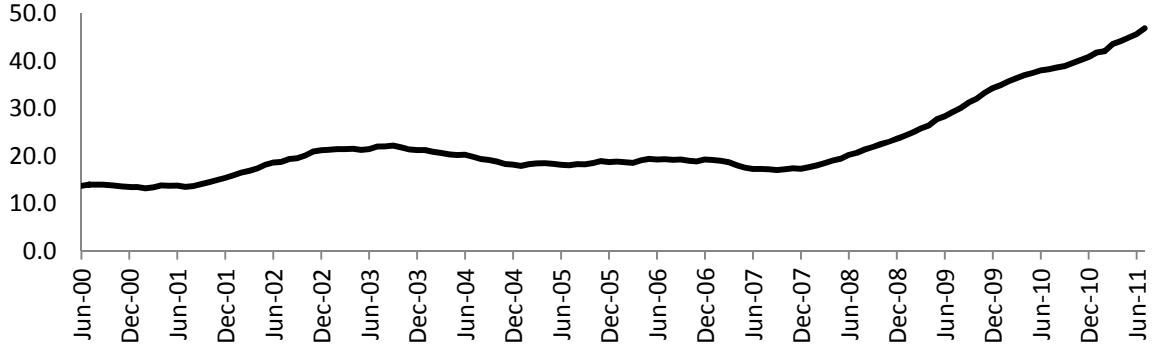


Excess Returns and Unemployment Duration - II

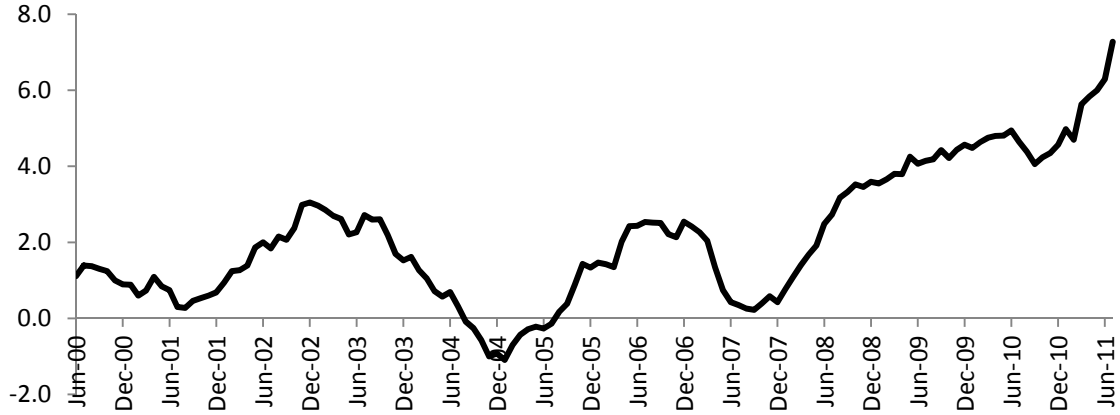
Excess Returns - Commercial Banks
3-Quarter Centered Moving Average



Average Duration of Unemployment : Finance
12-month Centered Moving Average



Relative Duration of Unemployment : Finance
12-month Centered Moving Average



The Dispersion Index

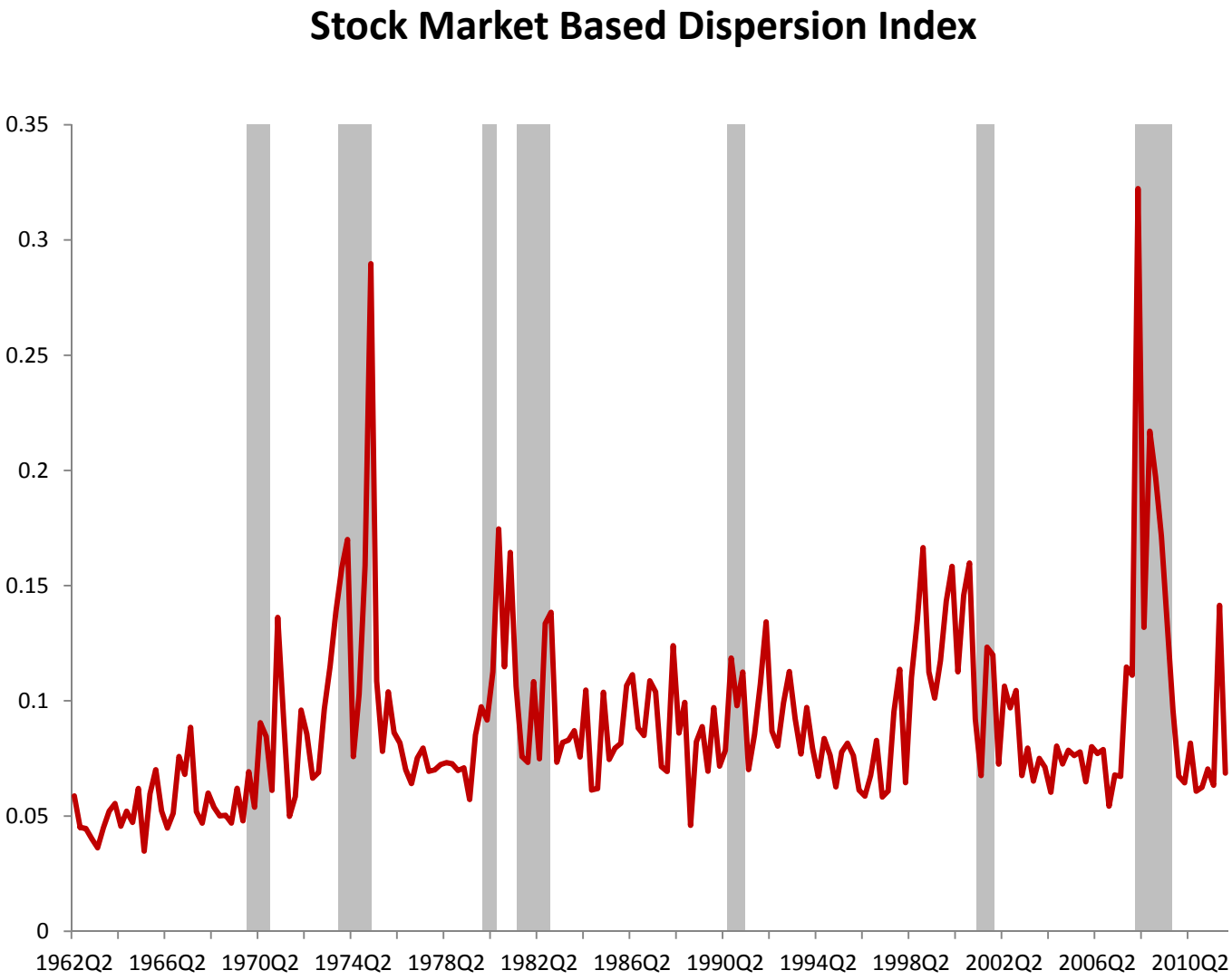
Dispersion of stock returns across industries can be used as a proxy for shocks to the desired allocation of labor.

Over time, as the actual allocation responds to this change, the unemployment rate should rise. (Fischer Black, 1982)

Index is based on Standard and Poor's indexes of (over 50) industry stock prices.

$$\text{Dispersion}_t=[\sum_{i=1}^{n} w_i(R_{it}-R_t)^2]^{1/2}$$

R_{it} is the growth rate of industry *i's* stock price index, R_t is the growth rate of the S&P500, and W_i is a weight based on the industry's share in total employment.


Stock Market Based Dispersion Index
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1962Q2
1966Q2
1970Q2
1974Q2
1978Q2
1982Q2
1986Q2
1990Q2
1994Q2
1998Q2
2002Q2
2006Q2
2010Q2

This (or a very similar) index has been used in a number of previous studies.

For the U.S.:

Loungani, Rush and Tave (1990)

Brainard and Cutler (1993)

Loungani and Trehan (1996)

For the U.K.:

Loungani (1991)

Brainard (1992)

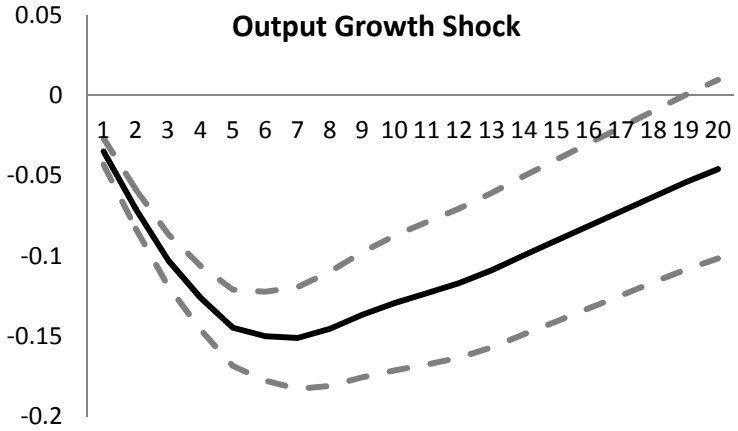
Here we will:

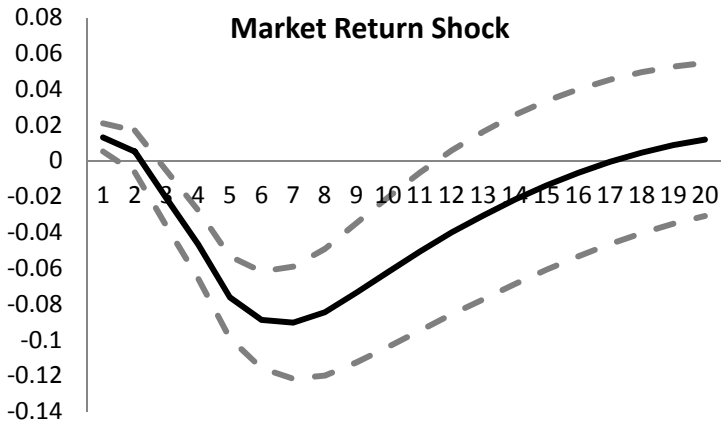
Look at a sample that includes the Great Recession, where long duration unemployment has jumped.

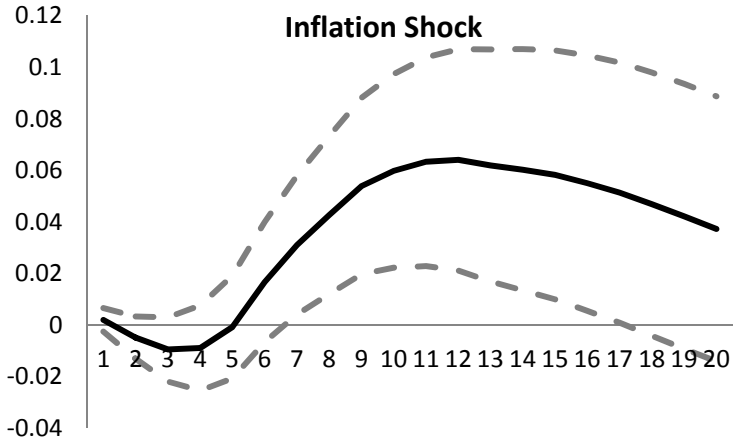
Compare the performance of our index to the uncertainty measure proposed by Bloom (2009).

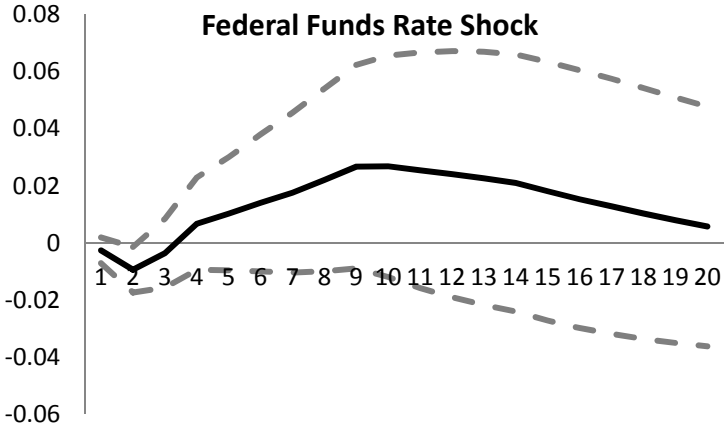
Look at how well the dispersion index does in a panel of industrialized countries.

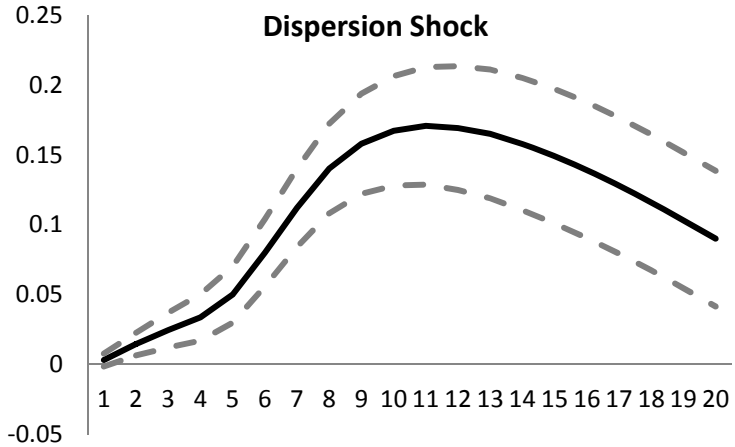
Response of Long Duration Unemployment to:



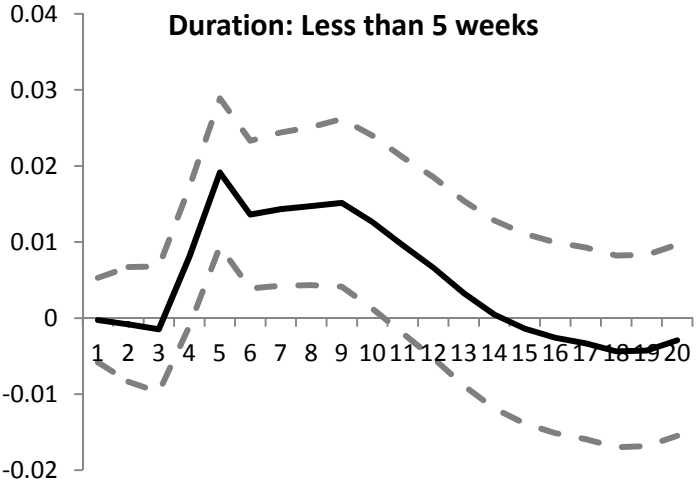


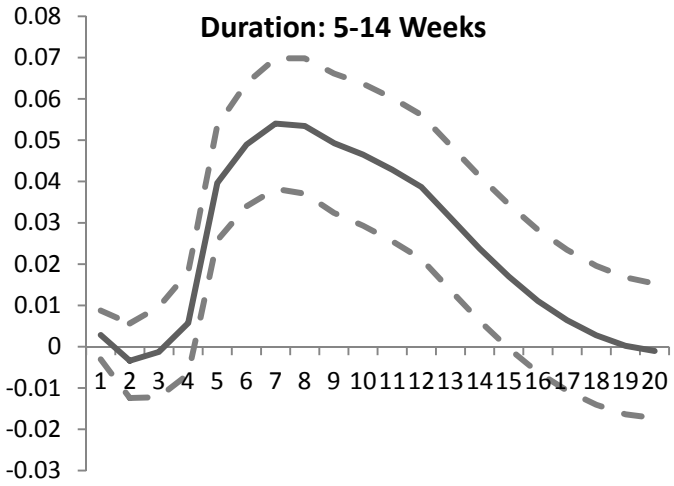


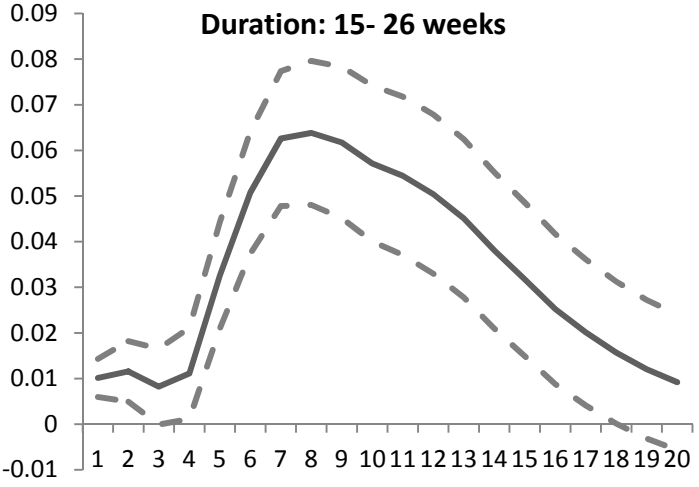




Effect of Dispersion Shock on Unemployment by Duration

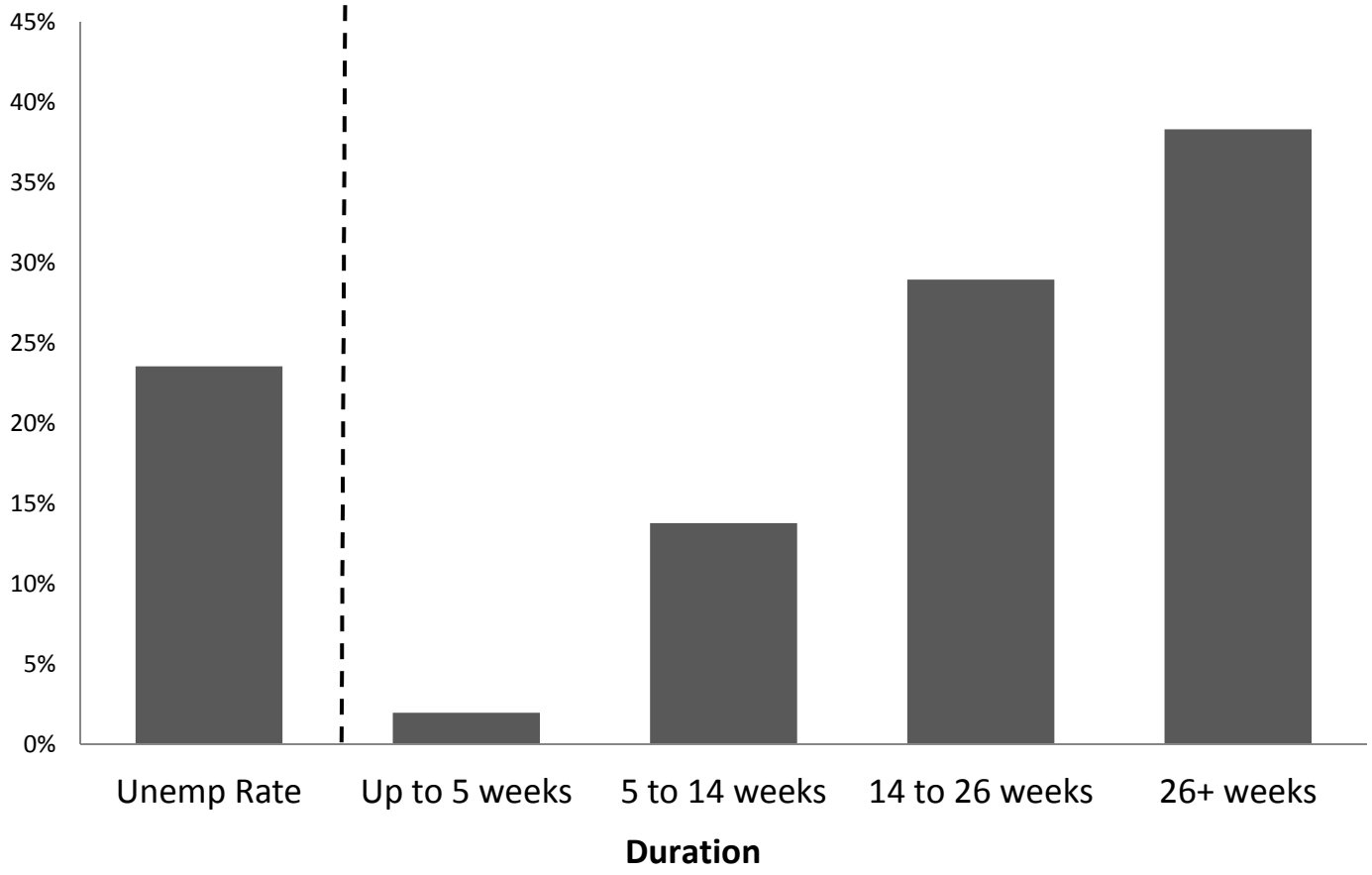




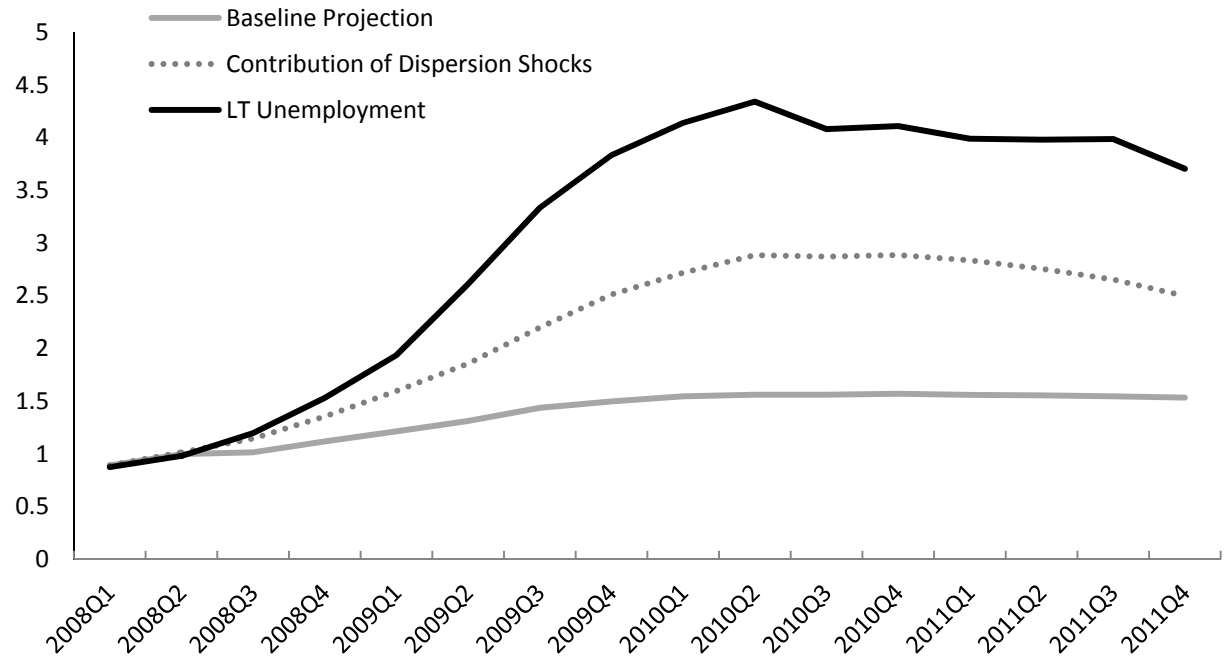


Variance of Unemployment Explained by Dispersion Index

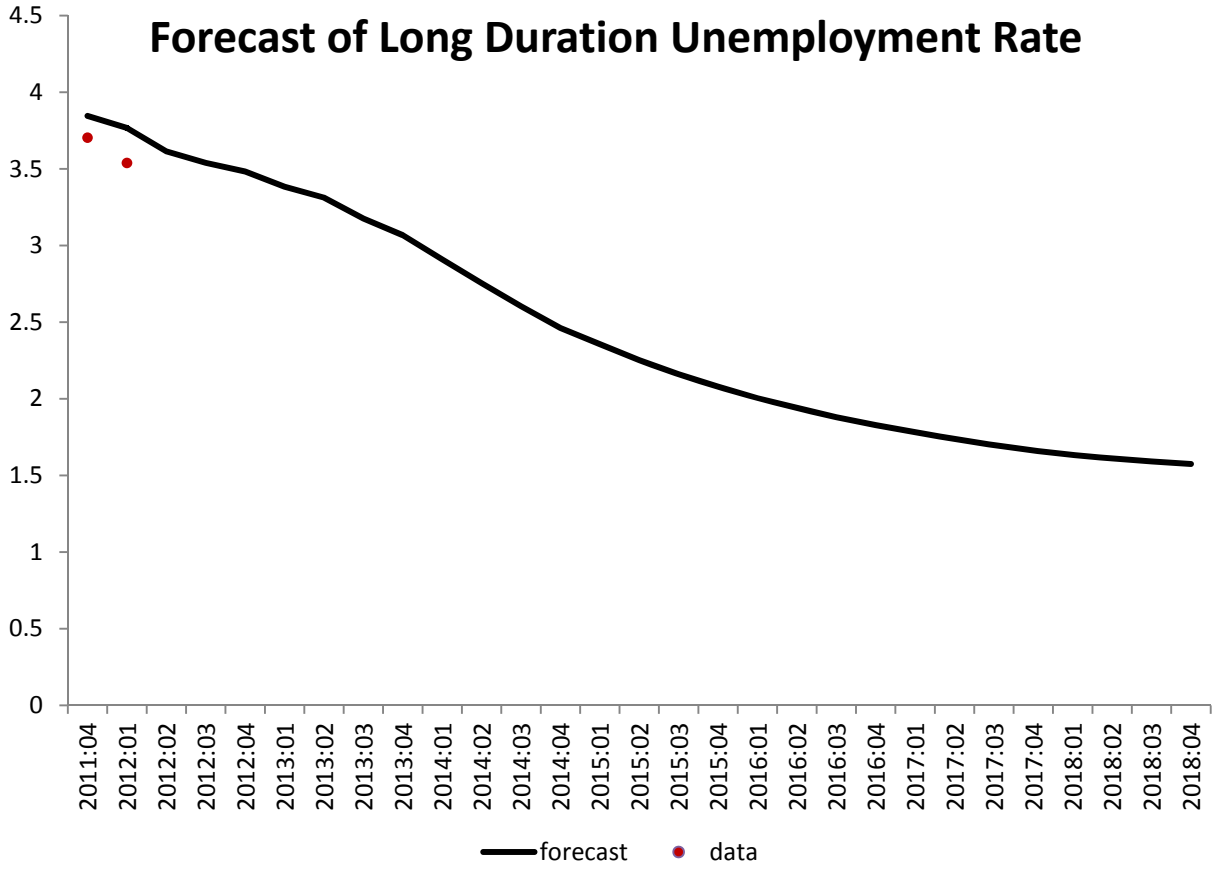
(20 quarters out)



Decomposition of Long Duration Unemployment During the Great Recession



Forecast of Long Duration Unemployment Rate



Sectoral Shocks Vs. Uncertainty

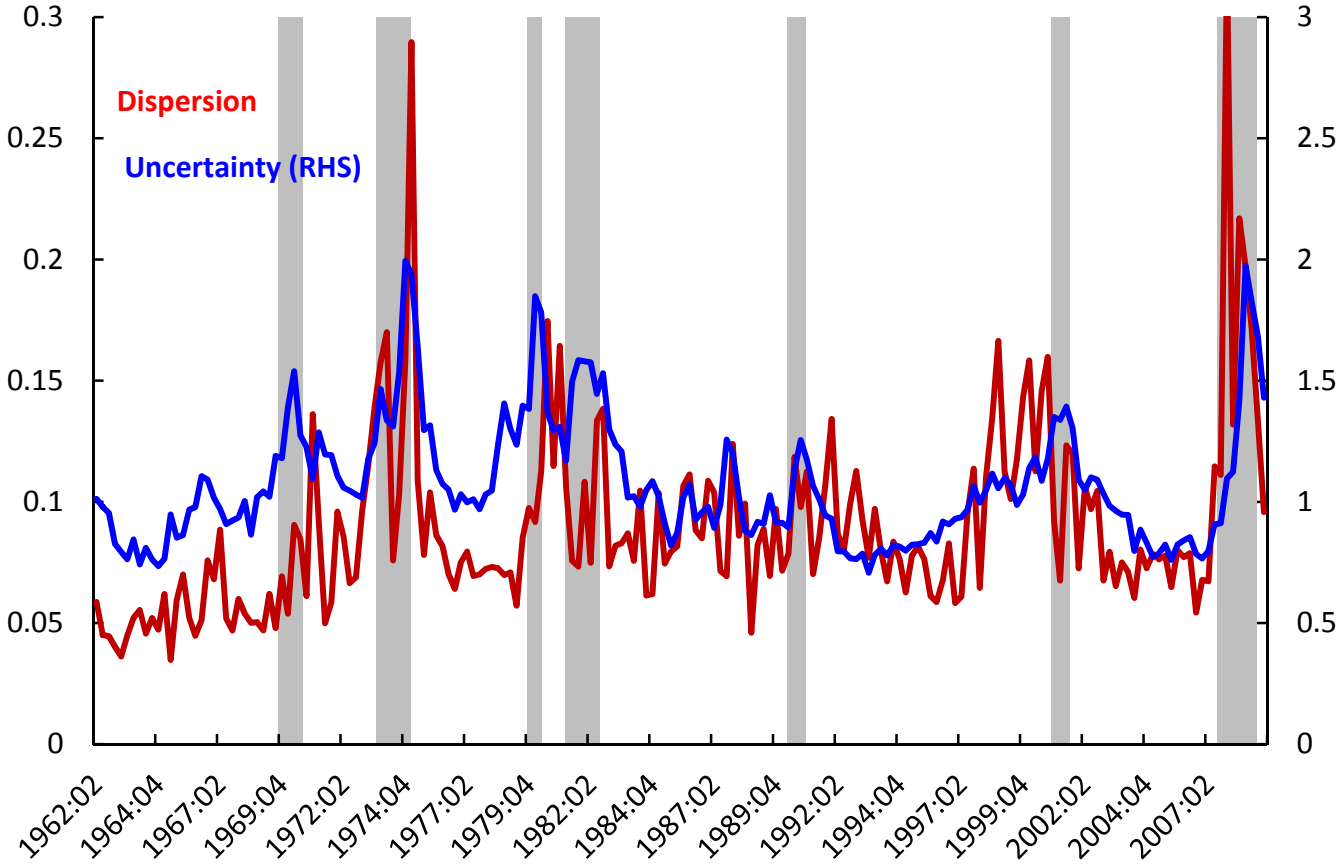
Bloom (2009): Uncertainty shock can have significant negative effects on the economy, as firms optimally choose to “wait-and-see”.

These effects are temporary. Employment falls sharply for 6 months after an uncertainty shock, but a year later is above the original level.

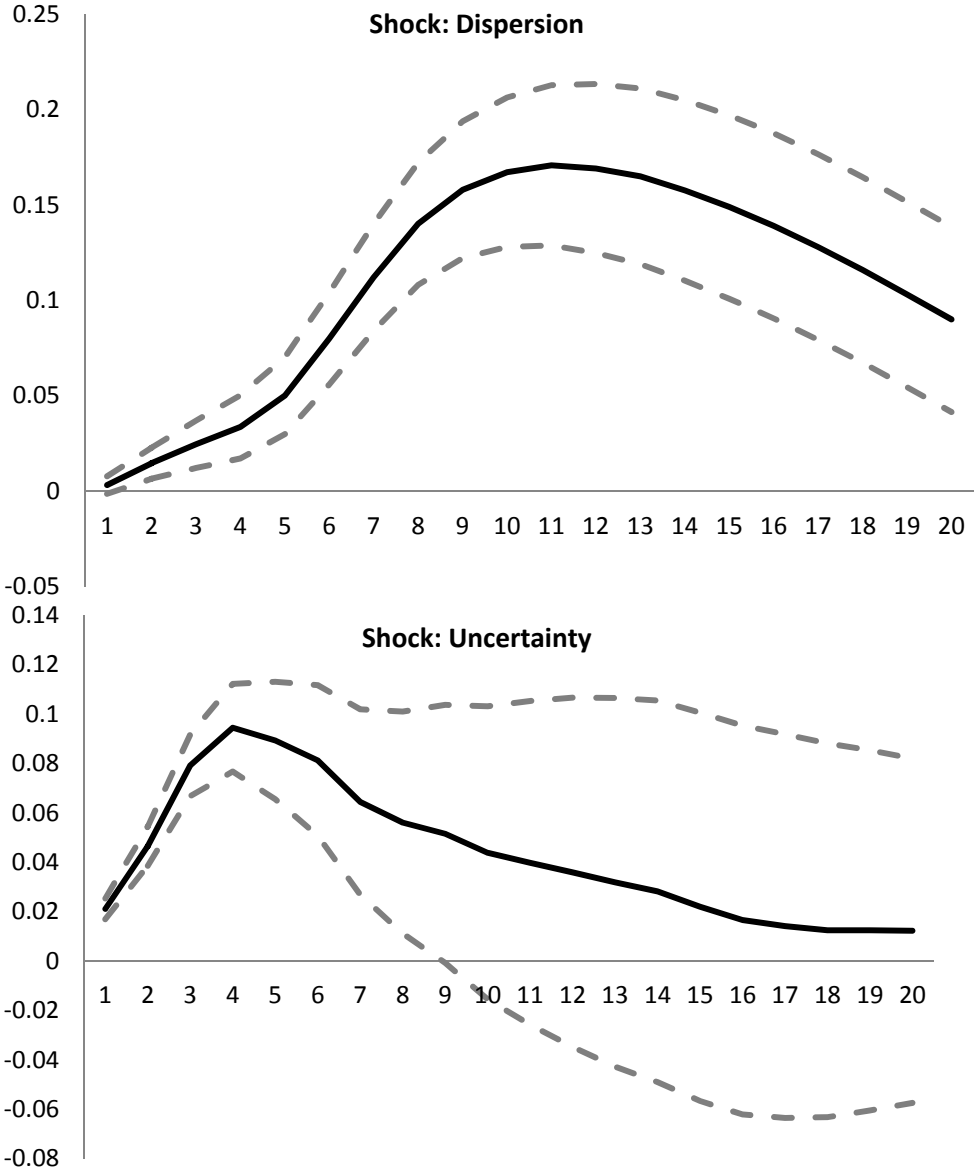
While the dispersion index is a measure of cross section volatility, the uncertainty index is focused on the time dimension.

- From 1962 to 1985, it is based on a monthly standard deviation of daily S&P500 data.
- Since then, it is the VXO index of implied volatility from the Chicago Board of Options Exchange.

Dispersion Index and the Uncertainty Index



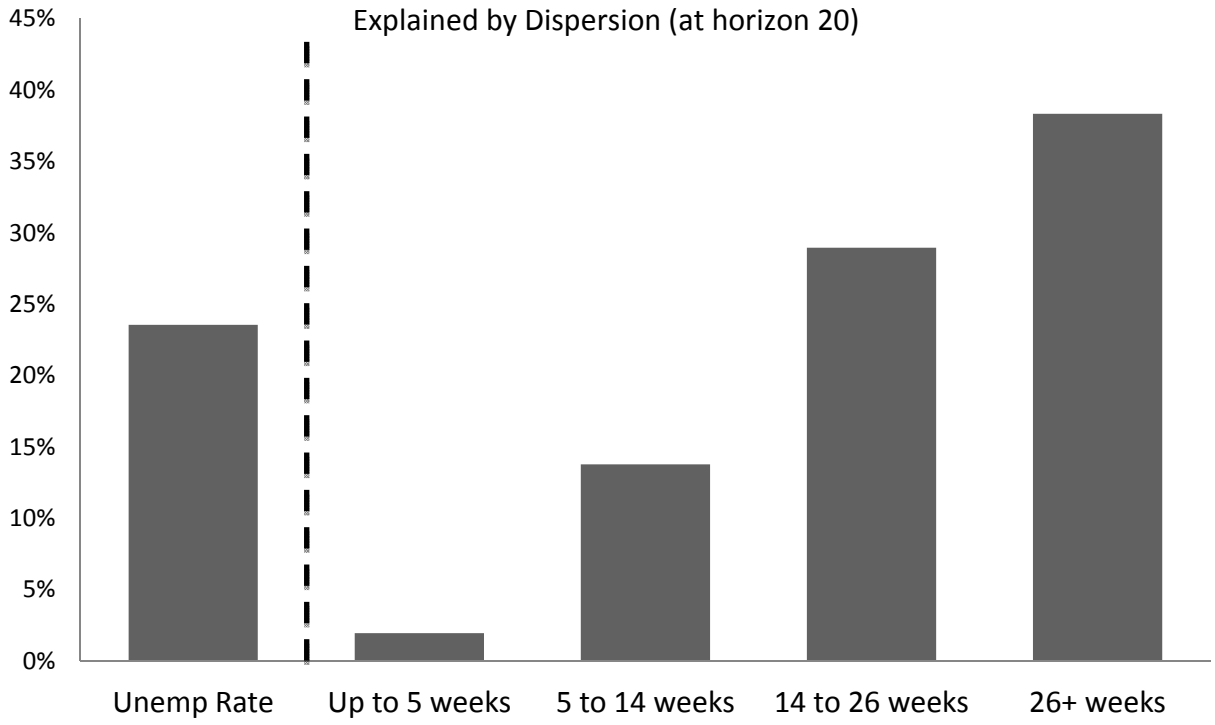
Comparing Long Duration Unemployment Responses to Dispersion and Uncertainty Shocks

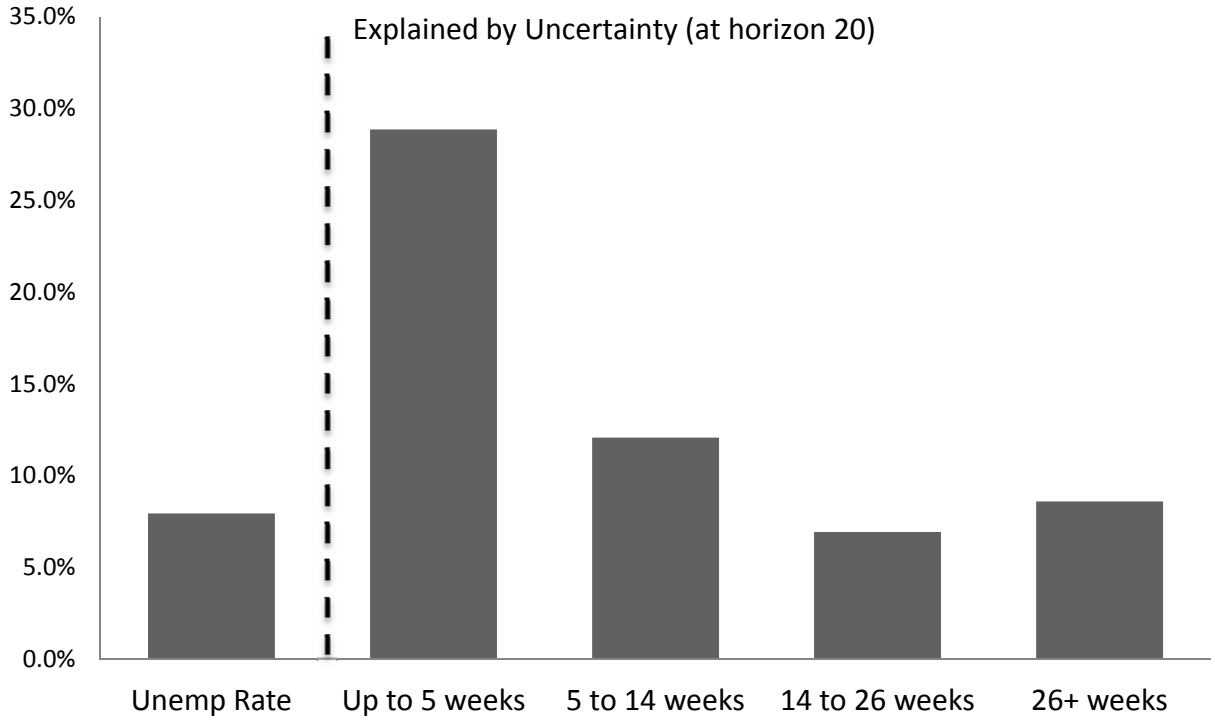


Forecast-error variance decomposition for the long-term unemployment rate - Augmented system

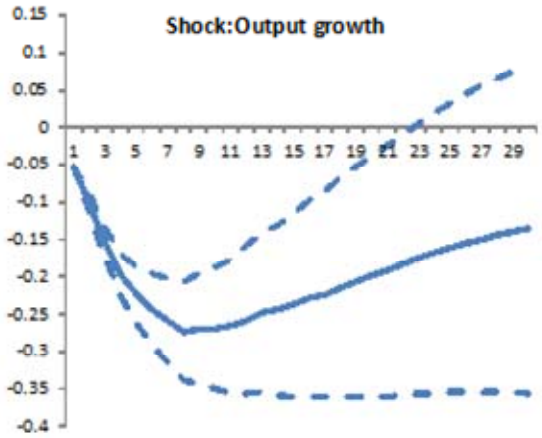
Horizon (Quarters)	Growth	Market Return	Long-Term Unemployment Rate	Inflation	Fed Funds Rate	Uncertainty	Dispersion
5	24.1%	4.2%	48.5%	0.6%	0.2%	19.9%	2.4%
10	25.1%	13.0%	23.1%	2.2%	0.4%	8.1%	28.2%
20	18.3%	9.6%	16.9%	9.3%	2.3%	5.7%	37.9%

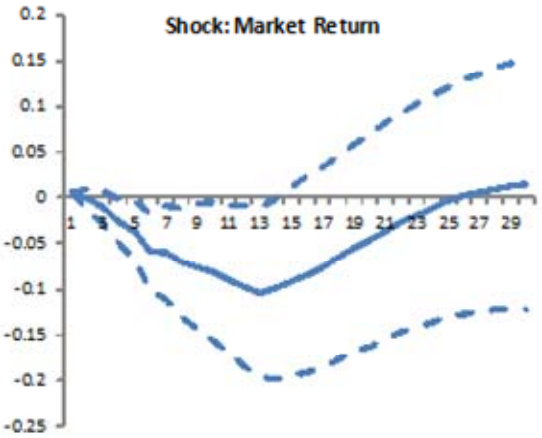
Variance of Unemployment

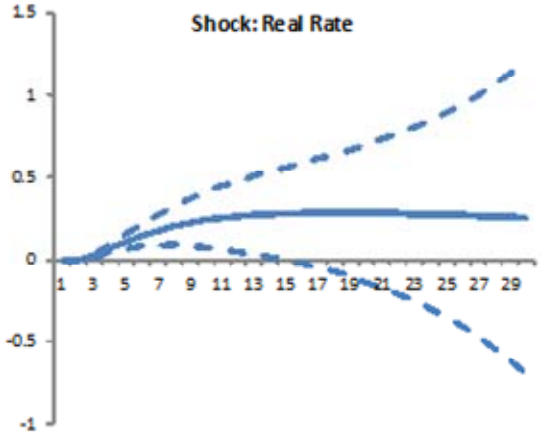


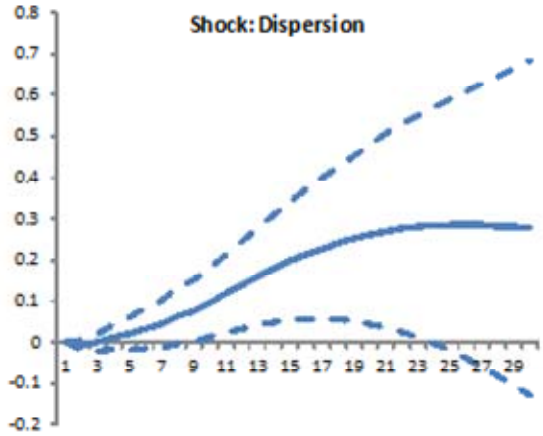


International Panel - Response of Unemployment Rate to









Conclusions

Sectoral shocks --- as measured by the cross section variance of stock prices --- affect the unemployment rate in a sample that includes the Great Recession.

Sectoral shocks matter more for long duration unemployment than for short duration unemployment.

> Close to half the increase in long duration unemployment since the beginning of the Great Recession can be attributed to sectoral shocks.

The stock-market-based dispersion index is quite different from the stock-market-based volatility index of Bloom (2009).

Similarly constructed dispersion indexes also affect the unemployment rate in a panel of developed countries.