

# **MEDIUM-TERM ADJUSTMENT AND THE INFLATION DYNAMIC: NEW KEYNESIAN ECONOMICS**

Kittichai Saelee

EE312

Thammasat university

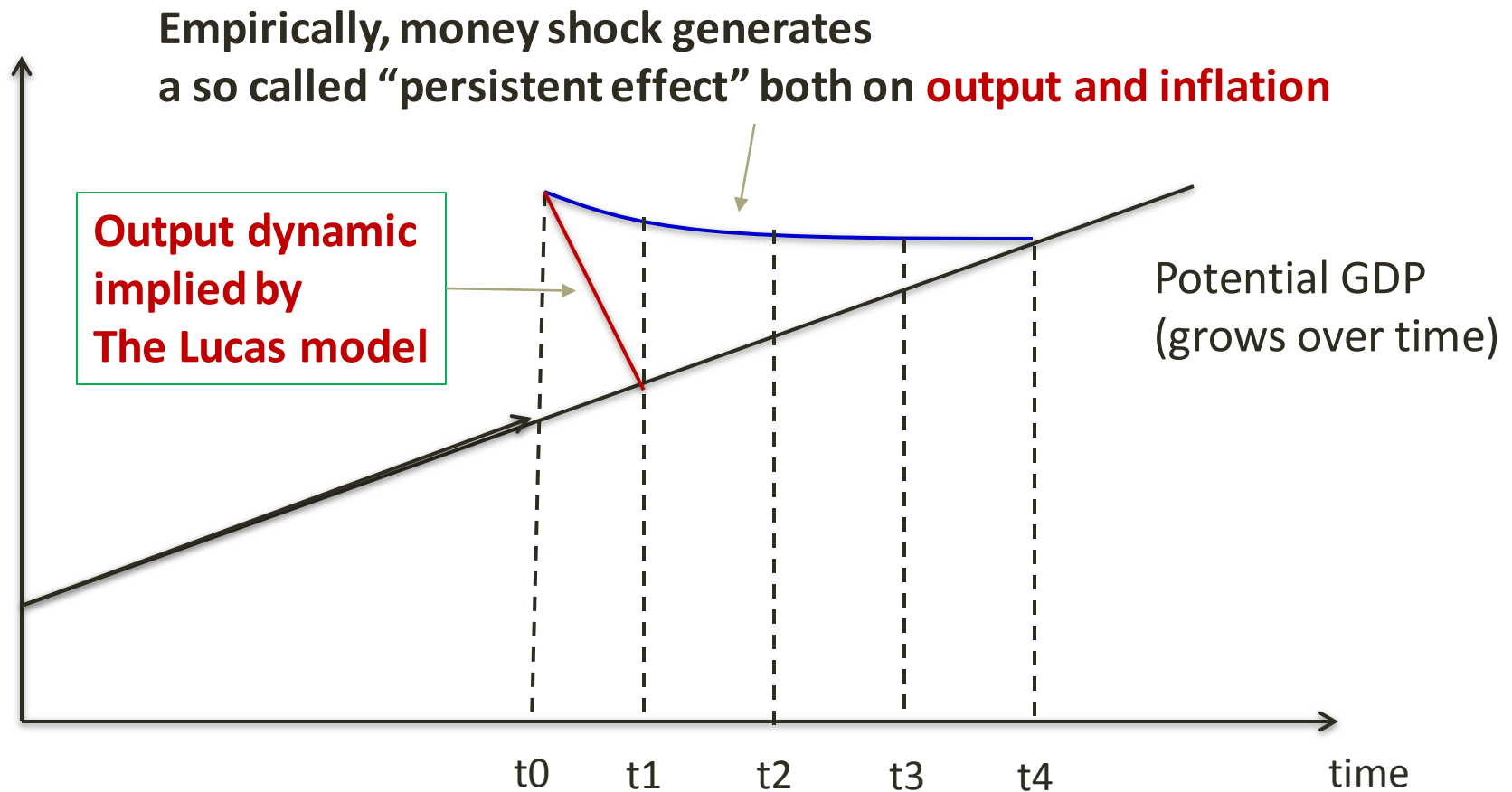
# AGENDA

- ~~Keynesian~~
- ~~Monetarist~~
- ~~New Classical~~
- **New Keynesian**

# WHAT'S WRONG WITH THE NEW CLASSICAL ECONOMICS

- Question: Can New Classical economics framework explain the pattern of business cycles? **How well does it explain the data?**
- Unfortunately, the answer is **NO**.
  - Demand shocks have **short-lived effect in their model**; gone within a period.
  - Empirical evidence suggests otherwise; **the impact of demand shocks is quite persistent.**

# VERY SHORT-LIVED EFFECT UNDER NEW CLASSICAL ECONOMICS V.S. PERSISTENT EFFECT IN THE DATA



# NEW INTERPRETATION TO THE BUSINESS CYCLES: RESURRECTION OF KEYNESIAN

- May be everything is back to the *incomplete in wage and price adjustment*, i.e. price and wage stickiness (rigidity)
- This leads to the resurrection of Keynesian school, newly known as the *New Keynesian economics*.
  - To explain (i) why rigidities exist , and (ii) seek for the implication of rigidities for business cycles.

# NEW KEYNESIAN ECONOMICS

- Criticize the ground on which New classical economics used for **the interpretation of business cycles and its adjustment process.**
- Argue for the role of **rigidity and imperfection** as an important way that can account for the **persistent pattern in medium-term adjustment.**
- Focus on **microeconomic reasoning** that justifies the existence of such rigidities and imperfection.

# NEW KEYNESIAN ECONOMICS

- Long and persistent business cycles occurs because of the prevalence of the followings in various market
  - Nominal rigidities in price and wage
  - Real rigidifies
  - Coordination failures
  - Hysteresis
  - Information frictions in labor market
- Let's tackle first things first, and to understand what they are.

# NOMINAL RIGIDITIES

- A situation in which agents cannot adjust the value of some nominal variables.
- Commonly used to refer to the situation in which firms and labor cannot adjust their **price** and **money wage**, respectively.
- The prevalence of nominal rigidities is one of the very first reasoning used to explain the pattern in which our economy slowly reverts to long-term trend.

# MICRO EVIDENCES ON PRICE SETTINGS

## KLENOW AND MALIN (2010)

Number of Price Changes per year (%) in Survey Data

Country	Paper	<1	1	2-3	≥4	Median	Mean (in months)
Austria	Kwapil <i>et al.</i> (2005)	24	51	15	11	1	12.7
Belgium	Aucremagne and Druant (2005)	18	55	18	8	1	11.9
Canada	Amirault <i>et al.</i> (2006)	8	27	23	44	2-3	6.8
Estonia	Dabusinskas and Randveer (2006)	14	43	25	18	1	10.0
Euro Area	Fabiani <i>et al.</i> (2005)	27	39	20	14	1	12.3
France	Loupias and Ricart (2004)	21	46	24	9	1	11.8
Germany	Stahl (2005)	44	14	21	21	1	13.5
Italy	Fabiani <i>et al.</i> (2007)	20	50	19	11	1	11.9
Japan	Nakagawa <i>et al.</i> (2000)	23	52	11	14	1	12.5
Luxembourg	Lunnemann and Matha (2006)	15	31	27	27	2-3	9.0
Mexico	Castanon <i>et al.</i> (2008)	-	-	-	-	-	5.7
Netherlands	Hoerberichts and Stokman (2006)	10	60	19	11	1	10.7
Portugal	Martins (2005)	24	51	14	12	1	12.7
Romania	Copaciu <i>et al.</i> (2007)	-	-	-	-	-	4.1
Spain	Álvarez and Hernando (2007a)	14	57	15	14	1	11.1
Sweden	Apel, Friberg and Hallsten (2005)	29	43	6	20	1	12.7
Turkey	Sahinoz and Saracoglu (2008)	-	-	-	-	-	3.0
United Kingdom	Hall, Walsh and Yates (2000)	6	37	44	14	2-3	8.2
United States	Blinder <i>et al.</i> (1998)	10	39	29	22	1	8.8

Note: Source: Álvarez (2008), Table 3. Mean implicit durations obtained from the interval-grouped data using the following assumptions: for firms declaring “at least four price changes per year”, 8 price changes are considered (i.e. mean duration of 1.33 months); for those declaring “two or three price changes per year”, 2.5 price changes are considered (i.e., 4.8 months); for those declaring “one change per year” a duration of 12 months, and for those declaring “less than one price change per year”, a change every two years is considered (i.e., 24 months).

1. Survey data for *price adjustment* of some randomly **selected firms**.

2. Asking them: **how many times does the firm change its price in a year?**

3. **Frequency of price adjustment** varies across firms in the sample.

4. What’s shown in the last column on the table represent **“average” of the duration in month** that firms keep their price fixed.

# MICRO EVIDENCES ON PRICE SETTINGS

## KLENOW AND MALIN (2010)

Price Durations by Category in the U.S. CPI

Durations in Months	<i>Posted</i>		<i>Regular</i>		% of CPI
	Median	Mean	Median	Mean	
<i>All Items</i>	3.4	6.2	6.9	8.0	100.0%
Durable Goods	1.8	3.0	1.8	5.0	21.7
Nondurable Goods	3.4	5.8	7.3	8.3	48.6
Services	7.6	9.4	7.6	9.6	29.7
Raw Goods	1.0	1.1	1.0	1.2	12.0
Processed Goods	4.4	6.9	7.7	8.9	88.0
Apparel	2.8	2.9	9.2	10.1	7.0
Education and Communication	5.4	6.2	6.7	6.3	7.3
Food	3.4	6.9	8.5	9.3	22.4
Home Furnishings	1.9	3.5	2.0	5.4	17.0
Medical Care	10.0	14.2	12.6	14.7	7.8
Recreation	6.3	7.5	9.4	9.8	8.5
Transportation	1.8	3.7	1.8	3.8	24.5
Other Goods and Services	8.6	14.7	12.1	16.7	5.5

1. Now survey by category in the U.S. CPI
2. Duration of price stickiness varies across different category.
3. Each firm can't adjust their price with *synchronization*.

# MICRO EVIDENCES ON PRICE SETTINGS

## KLENOW AND MALIN (2010): CPI

Country	Paper	Sample Period	Frequency (in %)
Austria	Baumgartner <i>et al.</i> (2005)	1996:01 – 2003:12	15.1
Belgium	Aucremanne and Dhyne (2004)	1989:01 – 2001:01	16.9
Brazil	Barros <i>et al.</i> (2009)	1996:03 – 2008:12	37.2
	Gouvea (2007)	1996:01 – 2006:12	37.0
Chile	Medina <i>et al.</i> (2007)	1999:01 – 2005:07	46.1
Denmark	Hansen and Hansen (2006)	1997:01 – 2005:12	17.3
Euro Area	Dhyne <i>et al.</i> (2006)	1996:01 – 2001:01	15.1
Finland	Vilmunen and Laakkonen (2005)	1997:01 – 2003:12	16.5
France	Baudry <i>et al.</i> (2007)	1994:07 – 2003:02	18.9
Germany	Hoffmann and Kurz-Kim (2006)	1998:02 – 2004:01	11.3
Hungary	Gabriel and Reiff (2008)	2001:12 – 2007:06	15.1
Israel	Baharad and Eden (2004)	1991:01 – 1992:12	24.5
Italy	Fabiani <i>et al.</i> (2006)	1996:01 – 2003:12	10.0
Japan	Saita <i>et al.</i> (2006)	1999:01 – 2003:12	23.1
Luxembourg	Lunnemann and Matha (2005)	1999:01 – 2004:12	17.0
Mexico	Gagnon (2009)	1994:01 – 2004:12	29.4
Netherlands	Jonker <i>et al.</i> (2004)	1998:11 – 2003:04	16.5
Norway	Wulfsberg (2009)	1975:01 – 2004:12	21.3 (21.9)
Portugal	Dias <i>et al.</i> (2004)	1992:01 – 2001:01	22.2
Sierra Leone	Kovanen (2006)	1999:01 – 2003:04	51.5
Slovakia	Coricelli and Horvath (2006)	1997:01 – 2001:12	34.0
South Africa	Creamer and Rankin (2008)	2001:12 – 2006:02	16.0
Spain	Álvarez and Hernando (2006)	1993:01 – 2001:12	15.0
United Kingdom	Bunn and Ellis (2009)	1996:01 – 2006:01	15 (19)
United States	Bils and Klenow (2004)	1995:01 – 1997:12	26.1
	Klenow and Kryvtsov (2008)	1988:02 – 2005:01	29.9 (36.2)
	Nakamura and Steinsson (2008a)	1988:01 – 2005:12	21.1 (26.5)

# MICRO EVIDENCES ON PRICE SETTINGS

## KLENOW AND MALIN (2010): *PPI*

Country	Paper	Sample Period	Frequency (in %)
Belgium	Cornille and Dossche (2008)	2001:01 – 2005:01	24
Colombia	Julio and Zarate (2008)	1999:06 – 2006:10	20.2
Euro Area	Vermuelen <i>et al.</i> (2007)	Various	21
France	Gautier (2008)	1994:01 – 2005:06	25
Germany	Stahl (2006)	1997:01 – 2003:09	22
Italy	Sabbatini <i>et al.</i> (2006)	1997:01 – 2002:12	15
Portugal	Dias <i>et al.</i> (2004)	1995:01 – 2001:01	23
South Africa	Creamer (2008)	2001:12 – 2006:02	19.5
Spain	Álvarez <i>et al.</i> (2008)	1991:01 – 1999:02	21
United Kingdom	Bunn and Ellis (2009)	2003:01 – 2007:12	26
United States	Nakamura-Steinsson (2008a)	1988:01 – 2005:12	24.7
	Goldberg-Hellerstein (2009)	1987:01 – 2008:10	33.3

Note: Source: Álvarez (2008), Bunn and Ellis (2009), Goldberg and Hellerstein (2009) and the published versions of Cornille and Dossche (2008) and Gautier (2008). Frequencies for Nakamura and Steinsson (2008a) correspond to finished goods. The Italian sample excludes energy products, while the French sample does not include business services.

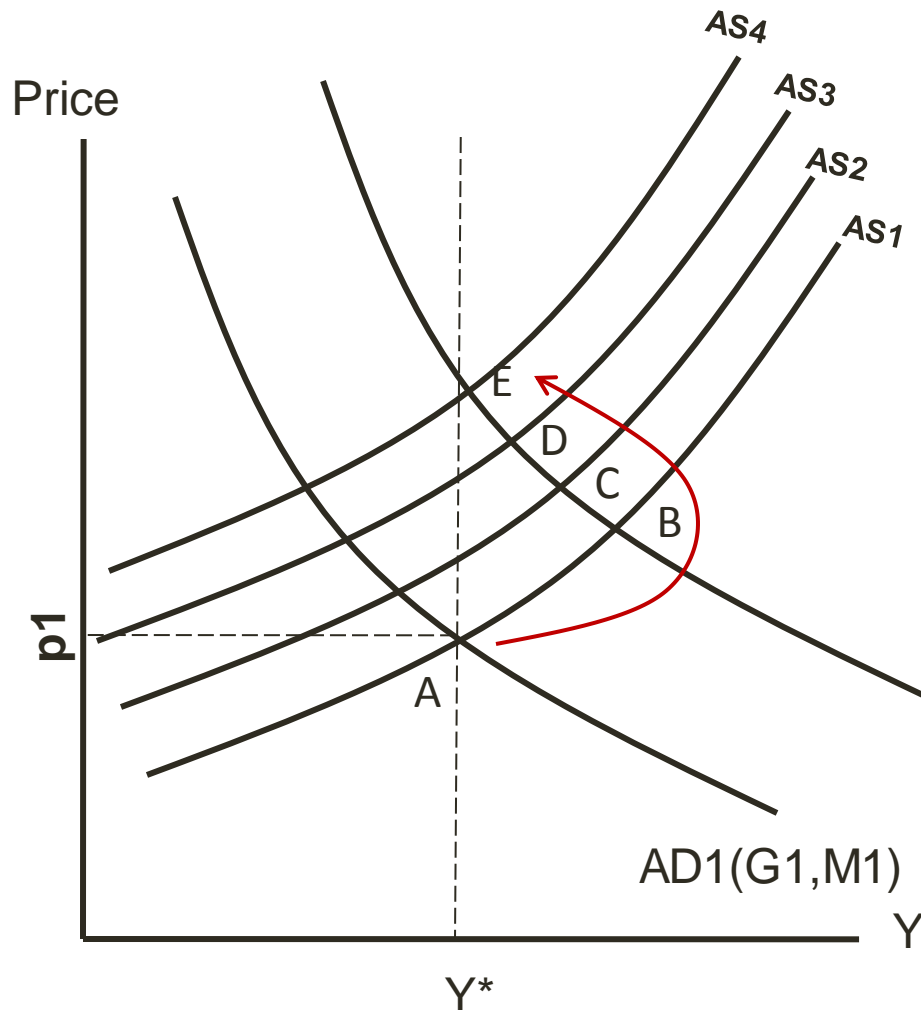
# RATIONALE FOR NOMINAL RIGIDITY / INFREQUENT ADJUSTMENT IN PRICE

- Why wouldn't firm adjust price to changing market condition, e.g. rising demand and rising cost?
- **Costly price adjustment: Menu cost**
  - Managerial costs : **Information / communication cost**
  - Loss of consumer goodwill: **antagonize customer**
  - Trigger competitive rounds of price cuts: **price war**

# IMPLICATIONS OF NOMINAL PRICE RIGIDITY: INTUITIONS

- In fact, it is the implication of ***unsynchronized adjustment of prices within and across sector***
- Effect of shocks gets passed on over time through the *staggering* adjustment.
  - Some firm can change their price right away; many keep their price fixed.
  - When firms can change their price, they will take into account what other firms did in the past.
  - The effect of what happens today get delivered into the future.

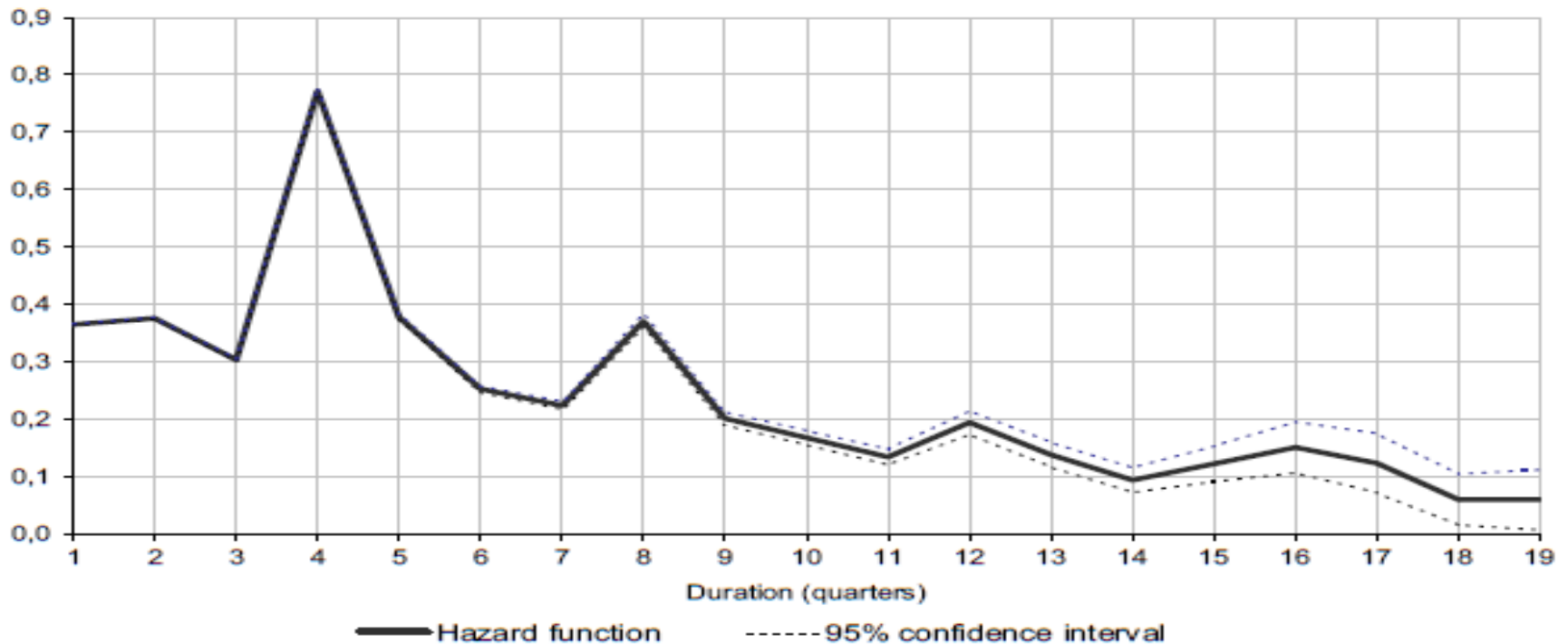
# IMPLICATIONS OF NOMINAL PRICE RIGIDITY: INTUITIONS



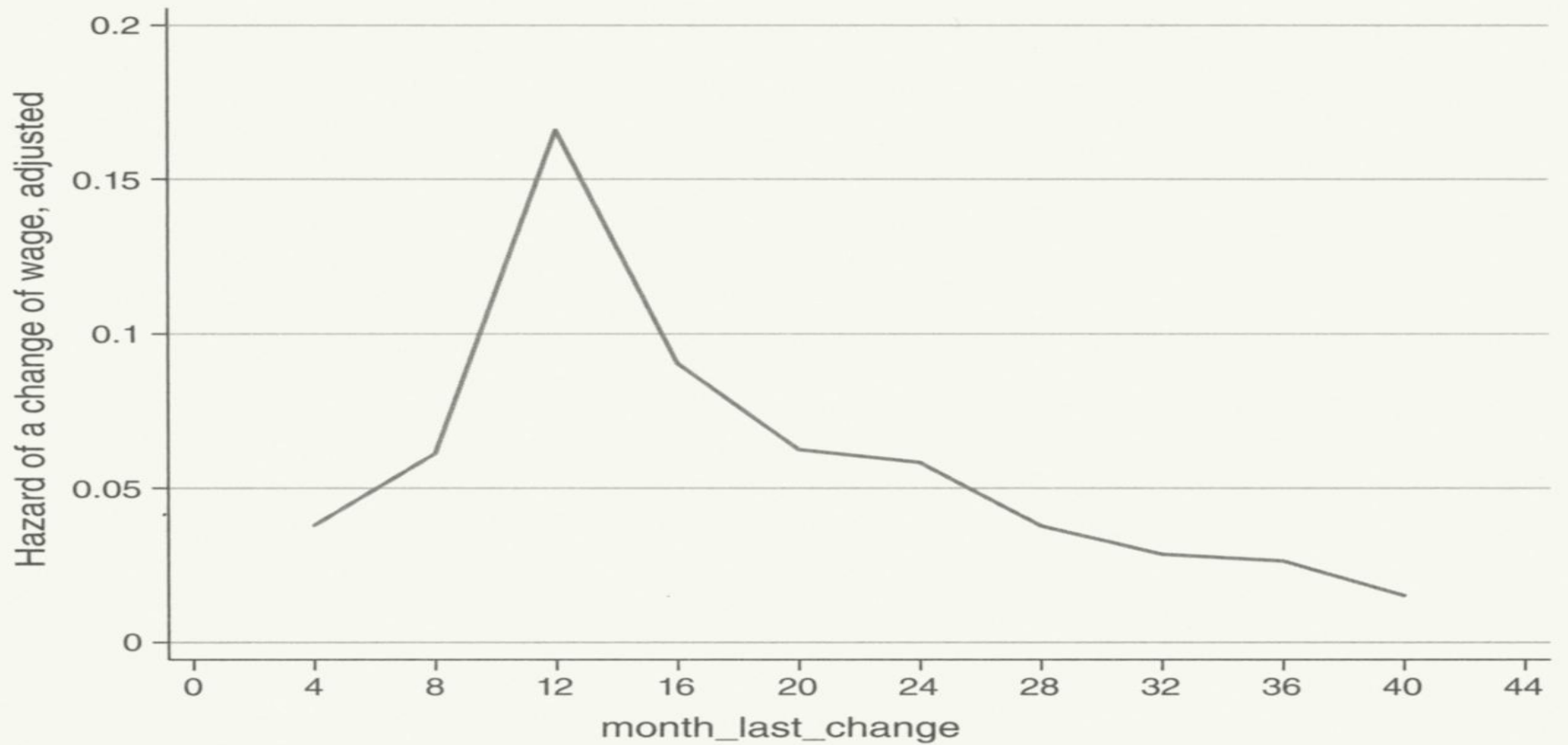
- In the other word, AS gradually shift when reverting to its natural level.
  - CPI Inflation exhibit degree of persistent/intertia!
  - Output slowly reverts to long-term trend.
- More to be seen in ee432 / ee412 with rigorous foundation.

# MICROECONOMIC SURVEY OF WAGE SETTING: FRANCE

Figure 2 : Hazard function of wage changes



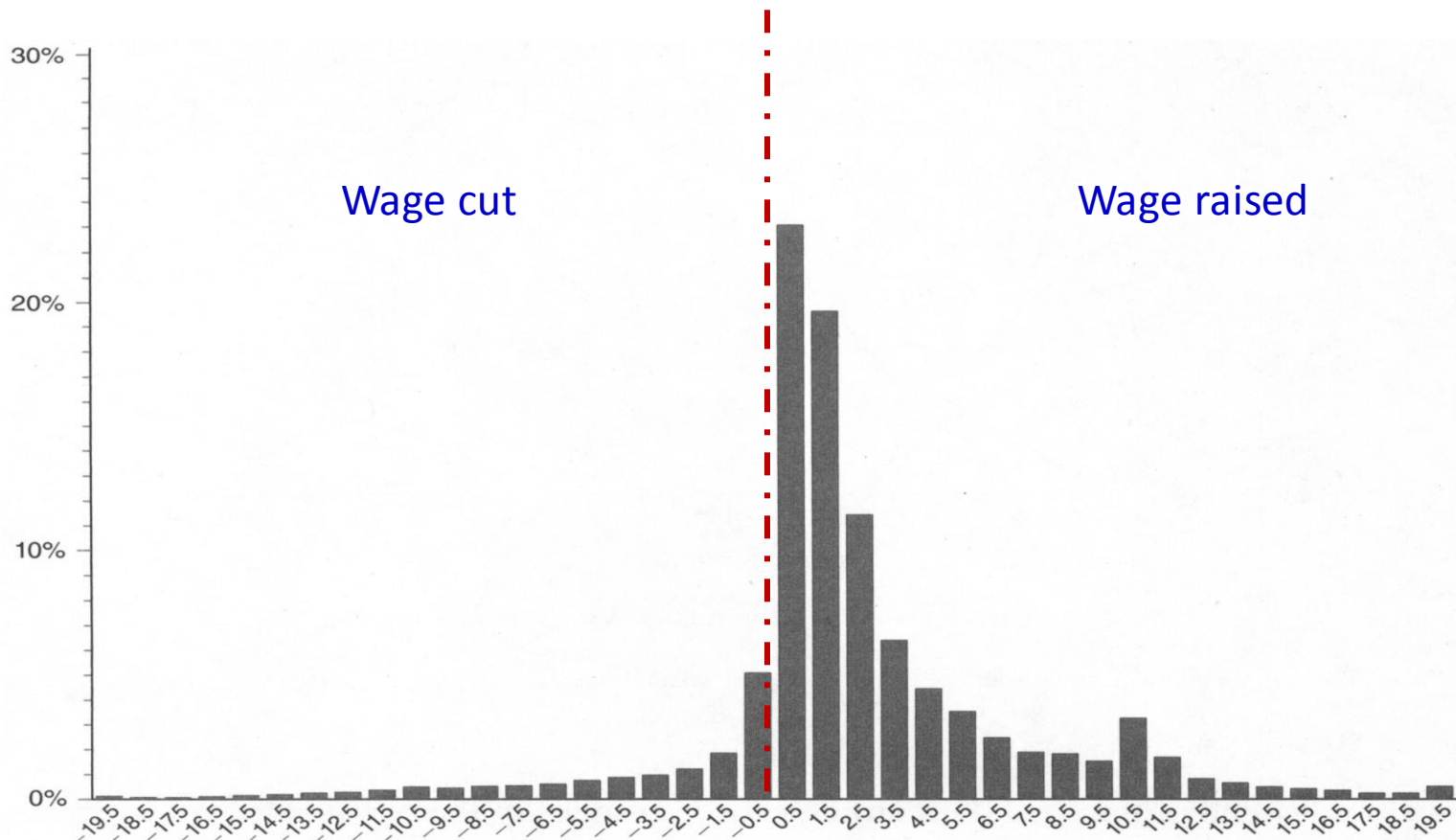
# MICROECONOMIC SURVEY OF WAGE SETTING: USA



# IMPLICATIONS OF THE WAGE STICKINESS

- The implications of wage stickiness for the medium-term adjustment are somehow similar to price stickiness.
- Workers take turn in renegotiating their wage; wage inflation move in a staggering fashion.
- The effect is compounded with price inflation, causing the longer persistent effect of shocks.

# WAGE CHANGE DISTRIBUTION: **DOWNWARD RIGIDITY**

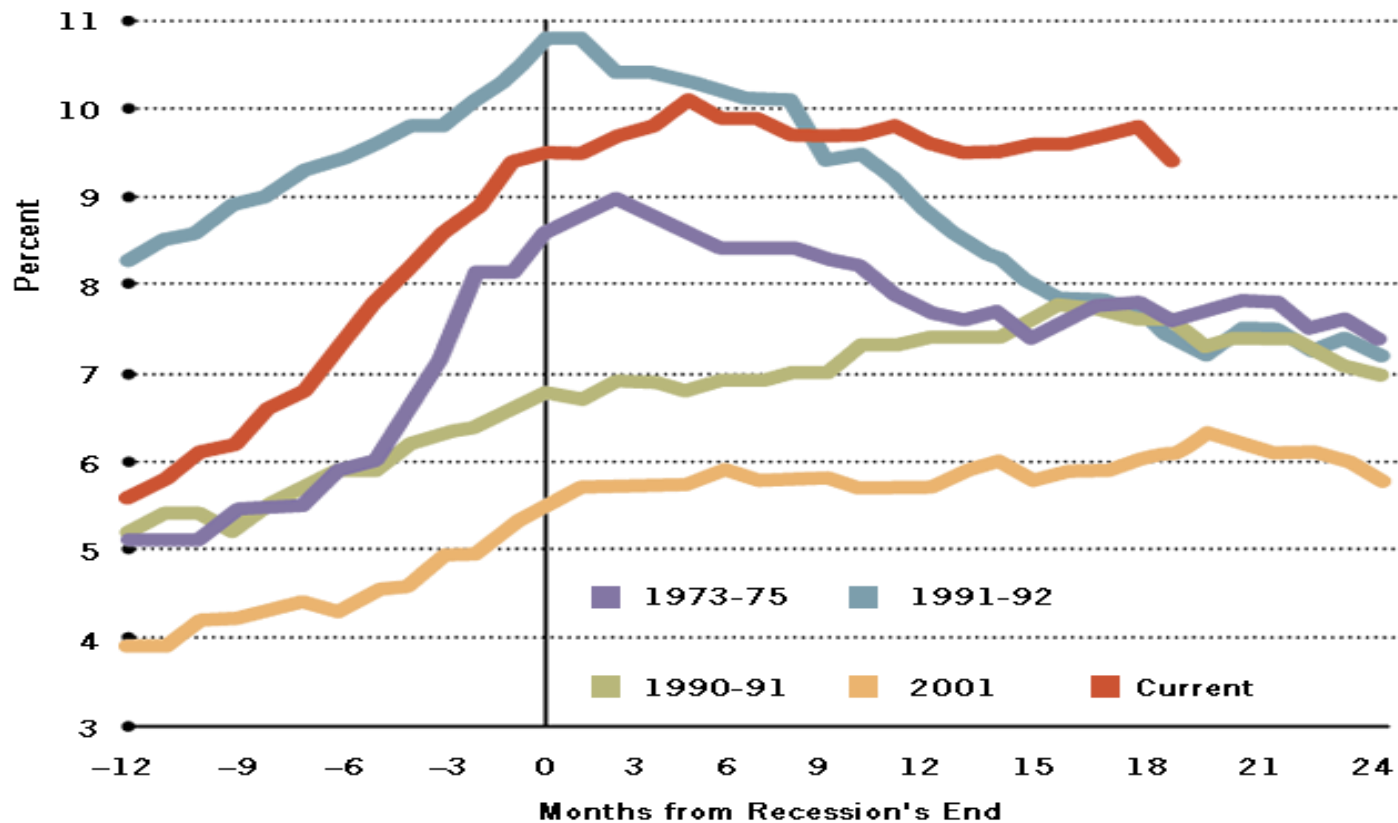


# IMPLICATIONS OF DOWNWARD RIGIDITY

- Ideally, when downturns hit, one expects market wage and market price to fall.
- Falling price is commonly observed whereas falling wage is hardly the case.
- Negative shocks would cause an even bigger trouble when **workers do not cut their nominal wage**; firm are forced to laid-off worker.
- Slackness in the labor market condition is then harder to solve even if recession has been over; **labor market is slow to recover after the recession.**

# US JOBLESS RECOVERY AFTER THE CRISIS

Unemployment Rates after Recent Recessions



# WHY DO WE LABOR CONTRACT AND DOWNWARD RIGIDITY?

- The argument might be the same as to why firm sets price.
- Think carefully!...
- But, price setting normally does not have contracting issue as the wage setting does; **contracting is a salient feature in labor market process.**

# ASYMMETRIC INFORMATION IN LABOR MARKET

- Contracting is designed to deal with the **moral hazard** and **adverse selection** problem that pervasively occur in the labor market processes/activities.
- Adverse selection: **unobserved productivity/ability**
  - Firm does not know the quality of labor.
  - Firm does not know if labor has skill sets needed for the job.
- Moral hazard: **unobserved effort**
  - When an employee is hired by firm, firm expects the employee to work hard.
  - But in the real world, employee has incentive to shrink the effort as the manager cannot perfectly observe the level of true effort.

# EFFICIENCY-WAGE CONTRACT AND DOWNWARD RIGIDITY

- From the point view of information frictions, stylized features observed in the labor market are the result of **optimal labor contract design**.
- Jannet Yallen (1984) provided a nice summary to the reason why this phenomena can be explained from the point view of **efficiency-wage theorem**.
- The efficiency wage theorem suggests that it is optimal for employer to **keep the level of real wage above the market rate**.

# EFFICIENCY-WAGE CONTRACT AND DOWNWARD RIGIDITY: WHY OPTIMAL?

- First, firm recruiting problem is costly.
  - Setting real wage above market rate reduce the turnover rate, and economize the training cost.
- Second, opportunistic worker could be alleviated.
  - Incentivize to work hard: **shrinking might get them to a big trouble; hard to get in when laid off.**
- Third, firm searches for high quality worker; lower wage causes high quality to move out and attract low quality to come in.

# EFFICIENCY-WAGE CONTRACT AND DOWNWARD RIGIDITY: WHY OPTIMAL?

- The consequence of so-doing results in **labor market rigidities**.
- From the static equilibrium, privately optimal decision results involuntarily unemployment; **a good example for failure to achieve the Pareto optimal under competitive economy**.
- From the dynamic point of view, this makes the business cycles propagation lasts longer; **the problem is getting hard to fix once one plunged into the problem**.

# COORDINATION FAILURE

- The coordination failure problem in Game theory; Prisoner's dilemma.
- Consider a firm which, **after a fall in aggregate demand**, must decide whether to cut price.
  - After a negative shocks in private sector, each firm must decide whether to cut its price
- Each firm wants to maximize its profit, but its profit depends not only on its pricing decision but also on the decision made by other firms.
  - Strategic decision problem.

# COORDINATION FAILURE: AN ILLUSTRATIVE EXAMPLE

Suppose two firms: Scenario outcome/pay-off:

- If neither firm cuts its price, the amount of real money (the amount of money divided by the price level) is low, a recession ensues, and each firm makes a profit of only fifteen dollars.
- If both firms cut their price, real money balances are high, a recession is avoided, and each firm makes a profit of thirty dollars.
- Although both firms prefer to avoid a recession, neither can do so by its own actions. If one firm cuts its price while the other does not, a recession follows. The firm making the price cut makes only five dollars, while the other firm makes fifteen dollars.

# COORDINATION FAILURE: THE MERIT OF STABILIZATION POLICY

#2 firm

	Cut	Not cut
Cut	(30 , 30)	(15, 5)
No cut	(5 , 15)	(15, 15)

#1 firm

( profit #1, profit #2 )

1. From the example, we have **multiple equilibria**.
2. Because each firm cannot communicate, it is therefore optimal for government to take collective actions.
3. This justifies the use of monetary and fiscal policy when shocks hit the economy, i.e. **to eliminate the inferior equilibrium**. (Signaling effect)

# HYSTERESIS AND UNEMPLOYMENT

- During the 1970s, global economy was hit by series of oil shocks. (1973 and 1979)
- Policy mistake in most countries had caused a sustained high level of inflation.
- The era of disinflation policy began in 1980 by a newly appointed FED Chairman Paul Volker
- U.S. had experienced a temporary recession.
- Mid of 1980s, things had returned to normal in the U.S.; low inflation and low unemployment were both successfully achieved.

# HYSTERESIS AND UNEMPLOYMENT

	1980	1981	1982	1983	1984	1985
European Economic Community	5.8	7.7	9.3	10.4	10.9	11.2
United States	7.1	7.6	9.7	9.6	7.5	7.2

**Table 1. Civilian Unemployment Rates in Europe, 1977–85**

Percent

<i>Country</i>	1977	1978	1979	1980	1981	1982	1983	1984	1985
Belgium	7.5	8.1	8.4	9.1	11.1	13.0	14.3	14.5	13.8
France	4.8	5.2	5.9	6.4	7.7	8.7	8.8	9.9	10.7
Germany	4.0	3.8	3.3	3.4	4.8	6.9	8.4	8.4	8.4
Italy	5.4	6.1	6.7	7.2	8.0	9.7	10.9	11.9	12.6
Netherlands	5.4	5.4	5.5	6.2	8.8	11.8	14.3	14.2	13.2
United Kingdom	5.3	5.1	4.7	6.0	9.2	10.6	11.6	11.8	12.0

Sources: Commission of the European Communities, "Annual Economic Review 1985–86," in *European Economy*, no. 26 (Nov. 1985), Statistical Annex, table 3.

# HYSTERESIS AND UNEMPLOYMENT

- In the Europe, things did not turn out to be the same as in the US.
- In the Europe, when inflation rate had come down, unemployment rate still remained high, even higher than historical average.
- So, why? **Downward rigidity should not be able to explain the differences.**
- Blanchard and Summer (1985) noted this phenomena in the mid of 1980s, and coined a term to capture the situation called the situation. **They called the hysteresis of unemployment.**

# HYSTERESIS AND UNEMPLOYMENT

- In Physics, a variable exhibits “hysteresis” if, when shocked away from an initial value, it shows no tendency to return even when the shock is over.
- In our context, the natural rate of unemployment rate seemingly depends on historical level of unemployment rate.

$$u_t^* = (1 - a)u_{t-1}^* + au_{t-1}$$

# HYSTERESIS IN THE LABOR MARKET

- BS noted that the hysteresis phenomena in the European labor market occurred because of the **interaction between “insiders” and “outsiders” through the labor market union problem.**
- The idea for labor union establishment is to create collective bargaining power among workers, and protect the benefit of union members, i.e. **“insiders.”**
- This adversely creates problem to **“outsiders”**, those who are not belonging to a member of union.

# HYSTERESIS AND UNEMPLOYMENT

- The insiders normally use their bargaining power to push the real wage above the market-clearing level, resulting in an unemployed group of outsiders.
- Insiders will push the real wage only up to a certain point, however, because the higher the real wage, the fewer insiders will be employed.
- If the economy wide aggregate demand slackens unexpectedly, a percentage of the insiders will be laid off.
- Recessions cause insiders to become outsiders.

# HYSTERESIS IN THE LABOR MARKET

- After the recession, with fewer insiders, wage bargain continues. The real wage rises and unemployment persists.
- Past unemployment, then, causes current unemployment by turning insiders into outsiders; this is the hysteresis phenomenon.
- Once insiders have become outsiders, a sort of unemployment trap occurs. **The outsiders do not exert downward pressure on real wages because they are irrelevant to the wage-bargaining process.**