

INFLATION TARGETING: THEORY V.S. PRACTICALITY

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EE432
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AGENDA

- **Historical development of monetary policy targeting: The advent of inflation targeting in 1990s**
- Monetary policy problem under inflation target
- Practical conduct of inflation target

What worked back then, but not now.

- **Exchange rate targeting:** financial crisis.
- **Interest rate targeting:** inflation expectation is out of control because central bank tempts to target too low level of interest rate.
- **Monetary targeting:** control issue/Break down relationship between nominal GDP growth and money growth.
- Then what?: **The advent of inflation targeting era**

THE ADVENT OF INFLATION TARGETING: HISTORICAL

- Emerged during 1990s; first-ever adopted in New Zealand.
- Later on, many small open-economy have adopted this policy framework
 - UK, Canada etc.
- **Became** popularized among emerging markets after the Asian financial crisis in 1997.
 - Thailand has adopted the policy since 2001.

THE ADVENT OF INFLATION TARGETING: WHAT IS IT?

- As a matter of fact, people didn't understand/know what it was back then – learning by doing policy
- Motivating Idea:
 - The ultimate goal is to control inflation & making sure that economy is staying on course.
 - As most intermediate targets ran into some problems, and hence abandoned, what should be our new intermediate target?

THE ADVENT OF INFLATION TARGETING

- Let's invent **a new target variable** that is closely related to actual inflation, and central bank “could” have the power to control it
- That's the “***inflation forecast***” – using inflation forecast as the intermediate target
- **Inflation targeting = inflation-forecast targeting!**
- **Strict v.s. flexible inflation-forecast targeting**

THE ADVENT OF INFLATION TARGETING: ESSENTIAL FEATURES

- Under the flexible inflation targeting; central bank has
 - Announced an “*Explicit*” numerical target of inflation rate
 - Using “*tools*” and adjust “*policy rate*” to make sure that *everything looks good in the future*
 - Inflation forecasts stay within **the target range** over the next 2 years (8 quarters)
 - Anticipated **path of real output** keeps track along **its potential level**

THE ADVENT OF INFLATION TARGETING: ESSENTIAL FEATURES

- If central bank projects that inflation will be off the target from above (below), they reacts with tight (easing) policy stance
- The effectiveness of policy depends on how central bank can entrust the public to believe in the same way, and hence respond accordingly
- Transparency and accountability are key important elements that establish the success of monetary policymaking under the inflation target
 - **Transparency:** Central bank communicates to public about outlook and stance of its policy – how they see the future, and what they plan to do in the future
 - **Accountability:** Central bank is required to report to the government if actual inflation has missed the target for extended periods of time

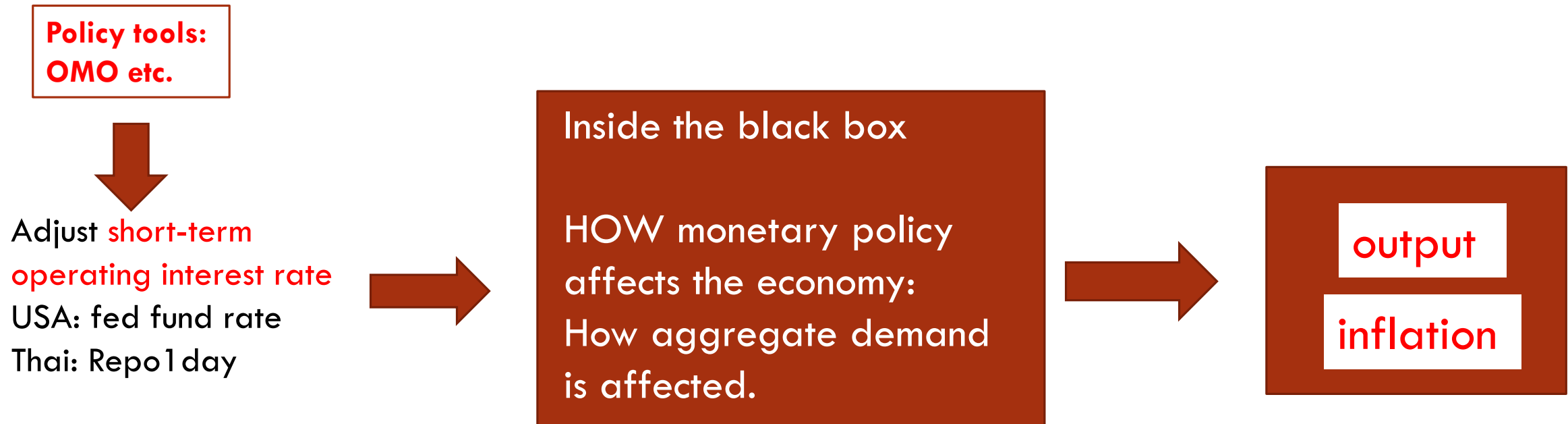
AGENDA

- Historical development of monetary policy targeting: The advent of inflation targeting in 1990s
- **Monetary transmission mechanism**
- Practical conduct of inflation target

MONETARY TRANSMISSION MECHANISM

- Under the inflation targeting, central bank needs to know about the developments of key macroeconomic variables
 - Need the model for the forecasting!
 - Once the model is set, projections can be made
 - Central bank then considers if any actions required!
- If any action required, the size of operation?
 - Need to have knowledge on policy impacts – **timing and magnitude**
 - Measuring effect of policy requires our understanding on **monetary transmission mechanism**

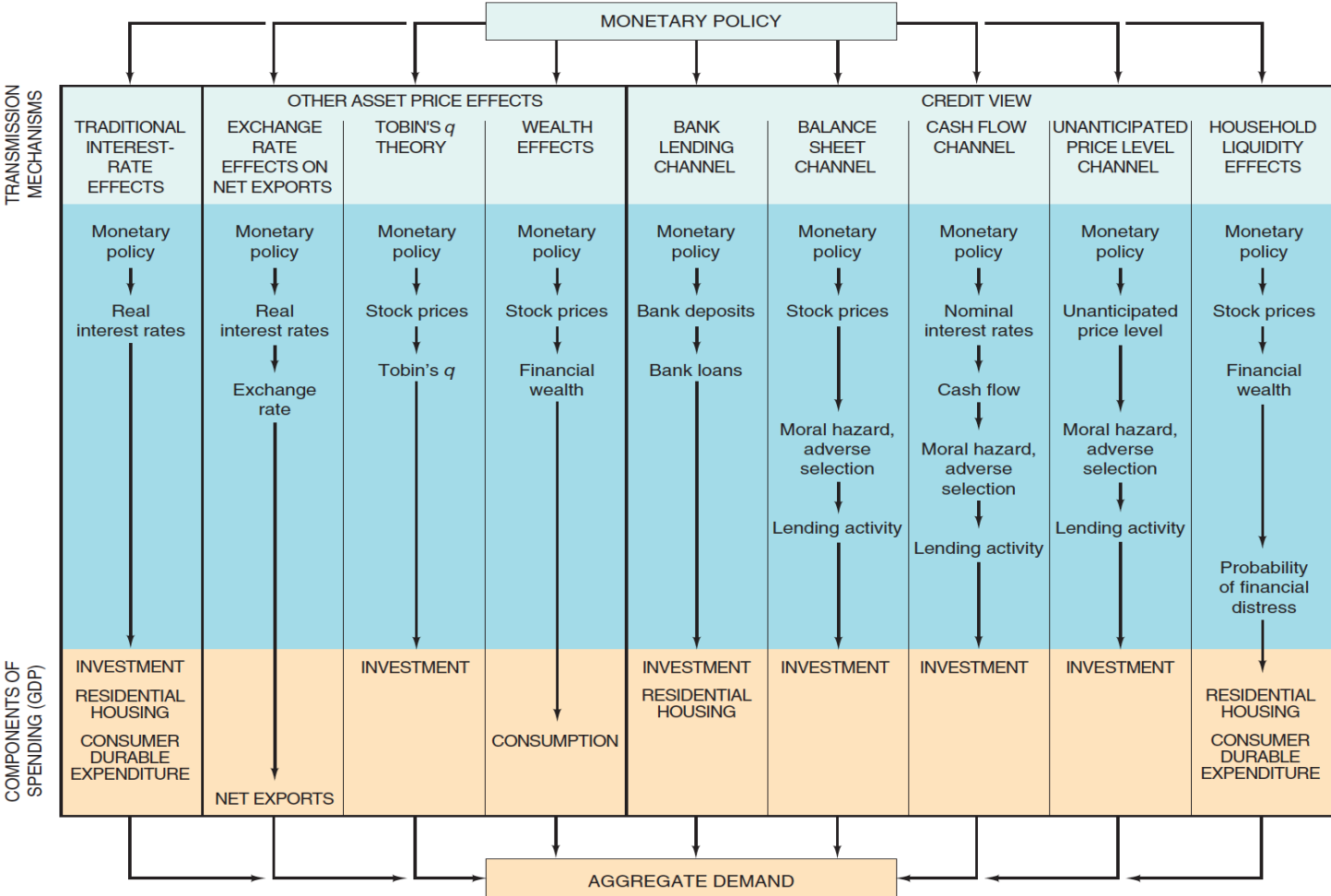
MONETARY POLICY TRANSMISSION MECHANISM



Monetary transmission mechanism:

- 1. how Monetary policy affects AD**
- 2. Why does AD affect output and inflation?**

CHANNELS OF MONETARY TRANSMISSION MECHANISM



TRADITIONAL INTEREST-RATE CHANNELS

- Change in the short-term interest rate affects **private spending**; and hence aggregate demand.
- Aggregate demand changes → output and inflation would be changed as well.
- Two comments for the correct interpretation of this channel: real interest rate / general interest rates

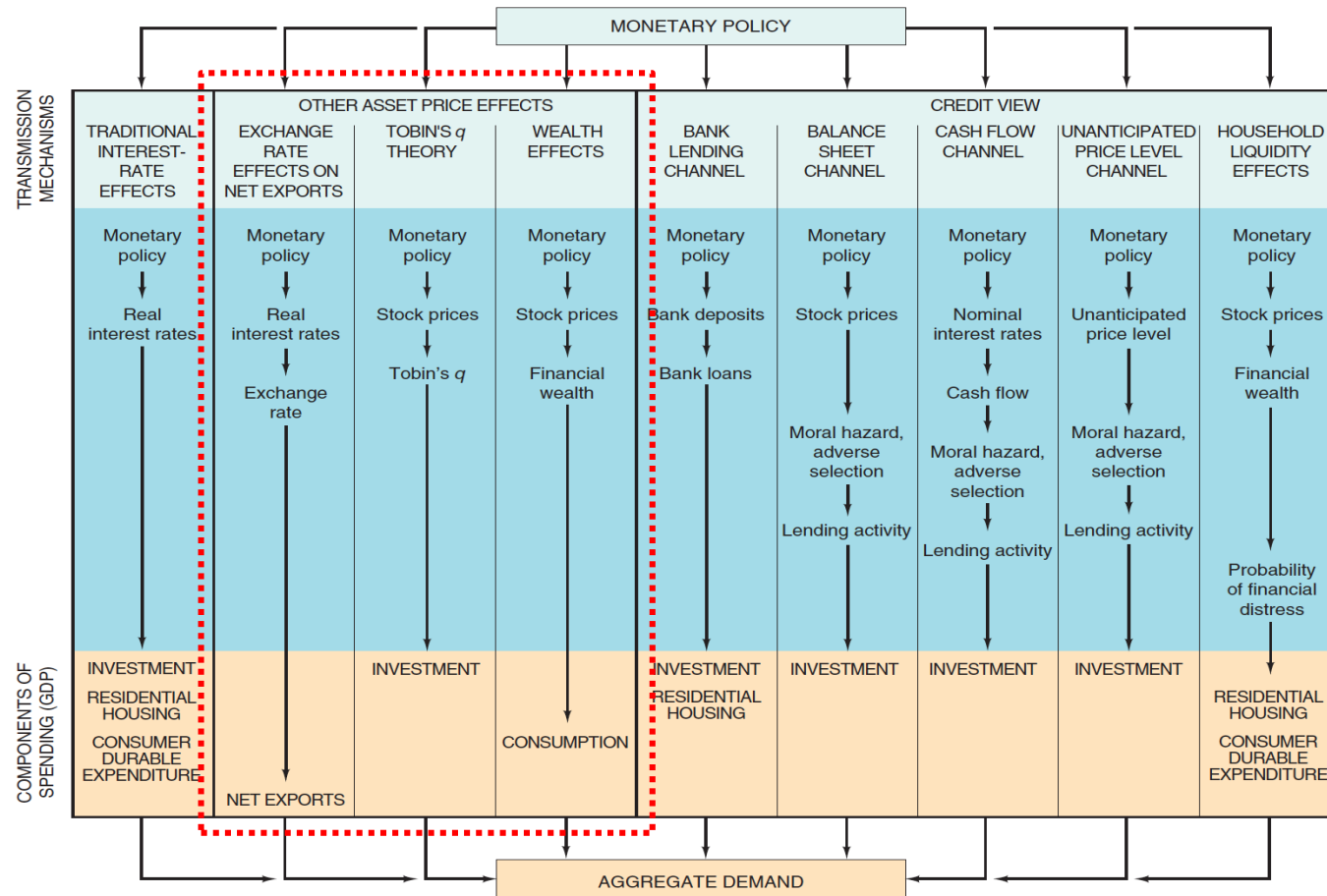
TRADITIONAL INTEREST-RATE CHANNELS

- In the short-run, inflation is slow to adjust (rigidity).
- Change in the nominal interest rate then tightly co-moves with change in the real interest rate.
 - An important feature of the interest-rate transmission mechanism is its emphasis on the *real (rather than the nominal) interest rate* as the rate that affects consumer and business decisions.

TRADITIONAL INTEREST-RATE CHANNELS

- It's not the real short-term interest rate that matters; **but it is the real long-term interest rate and general interest rates**
 - Change in the short-term also affects *path of future short-term interest rate*; this hence affects the path of long-term interest rate that is consistent to the *Term structure of interest rate*.
 - General interest rates adjust along the no-arbitrage condition required
- As inflation is slow to adjust, **real long-term interest rate will be changed as well.**

CHANNELS OF MONETARY TRANSMISSION MECHANISM



OTHER ASSET PRICE CHANNELS

- Channels representing the interplay between *interest rate* and *asset prices*
 - Foreign exchange rates
 - The prices of equities (stocks)
 - Wealth

EXCHANGE RATE CHANNELS

- Uncovered interest parity;

$$i_t = i_t^* + E(e_{t+1} - e_t)$$

- Change in domestic interest rate affect “relative” rate of return in international capital market.
- This affects flow of the cross-boarder capital movement; and hence value of the domestic currency, i.e. Thai Baht.

EXCHANGE RATE CHANNELS

- If domestic currency **appreciate** (“e” decreases), it affects the economy two important ways
 - First, via the spending channel
 - Decrease net export, and hence domestic AD
 - Lower domestic production; and hence lower inflation
 - Second, via the import price channel:
 - Exchange rate pass through; **directly lower inflation**

TOBIN'S Q THEORY

- Tobin's q Theory explains how monetary policy can affect the economy through **its effects on the valuation of equities (stock)**
 - Named according to James Tobin
- Defines q as the market value of firms divided by the replacement cost of capital

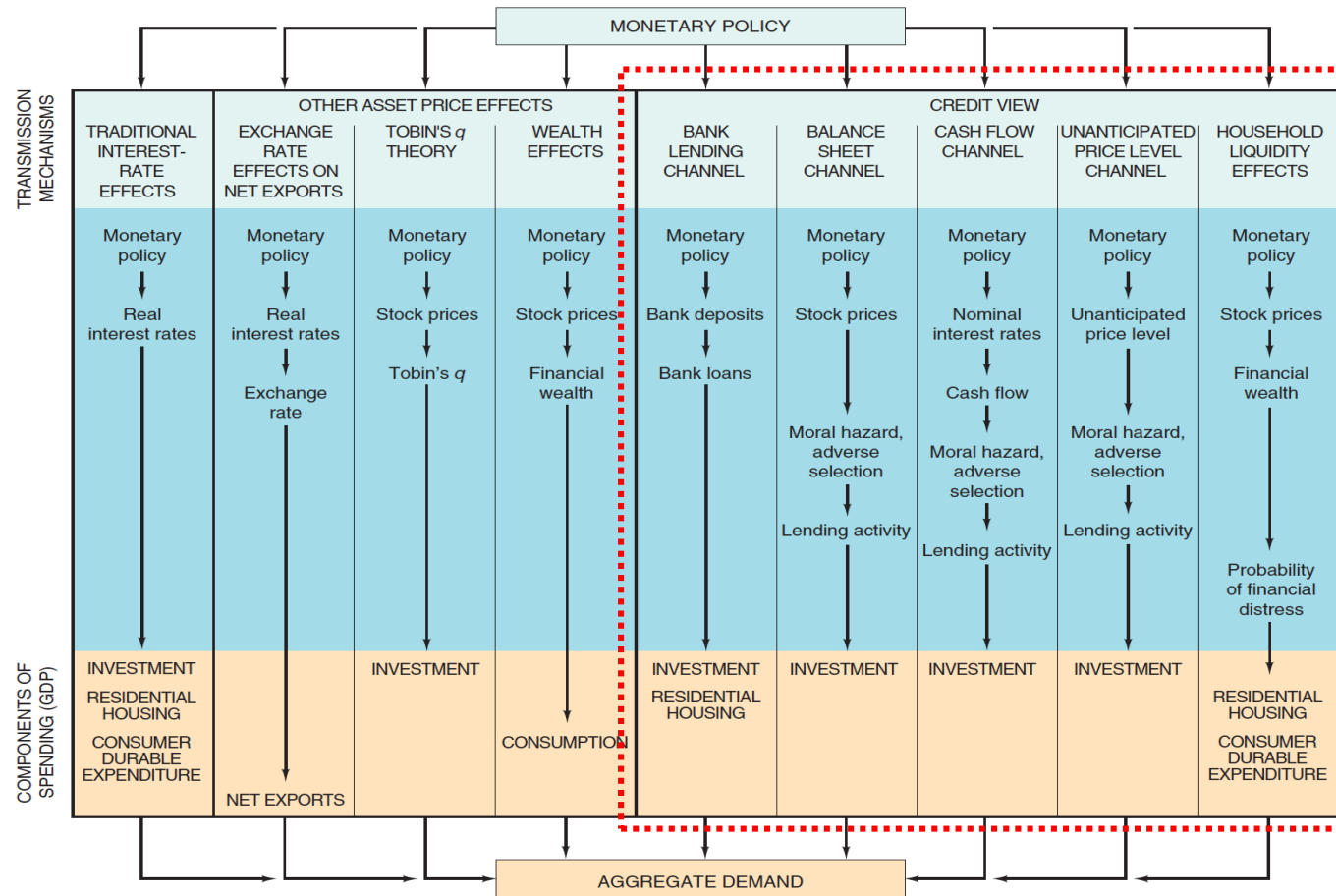
TOBIN'S Q THEORY

- If q is high, the market price of firms is high relative to the replacement cost of capital, and new plant and equipment capital is cheap relative to the market value of firms.
- When q is low, firms will not purchase new investment goods because the market value of firms is low relative to the cost of capital.

WEALTH EFFECTS

- Change in asset prices affect financial wealth of households, and hence affect their spending decisions
 - Franco Modigliani looked at how consumers' wealth might affect their consumptions.
- Lower interest rate normally pushes up the asset prices, thereby increasing the lifetime resources of consumers, and consumption should rise

CHANNELS OF MONETARY TRANSMISSION MECHANISM



CREDIT VIEW

- Dissatisfaction with the **conventional stories** that interest-rate effects explain the impact of monetary policy on expenditures on durable assets has led to a new explanation based on the problem of credit market imperfection!
 - Empirically, interest rate channels produce *limited quantitative effect*
 - E.g. Interest rate drops; but output doesn't change. So why?
 - *Observation found that "credit" doesn't grow as much as we thought (even interest rate decreased)*
 - The matter is about credit; understanding *the behavior of financial intermediaries* is needed

CREDIT VIEW

- The following four channels are commonly referred to under credit view channel
 - Bank lending
 - Firms' and households' balance sheets
 - Unanticipated price level effect
 - Household liquidity effect

CREDIT VIEW: BANK LENDING CHANNEL

- **Bank Lending Channel:** Based on the analysis that demonstrates that banks play a special role in the financial system because they are especially well suited to solve asymmetric information problems in credit markets

CREDIT VIEW: BALANCE SHEET CHANNEL

- **Balance Sheet Channel:** Like the bank lending channel, the balance sheet channel arises from the presence of financial frictions in credit markets
- Balance sheet channel generate *endogenous interaction* between *financial conditions of borrower and real economic sector*

CREDIT VIEW: BALANCE SHEET CHANNEL

- Expansionary monetary policy causes an increase in asset price;
- Typically associated with positive/rise in borrower's net-worth; improving balance sheet conditions
- As borrower net-worth increases, borrowing capacity would increase as well; as the degree of severity of in adverse selection/moral hazard felt
- Firms (both financial/non-financial) can borrow more in the financial system, and hence increase spending

CREDIT VIEW: CASH FLOW CHANNEL

- **Cash Flow Channel:** Apart from the improving conditions because of the asset revaluation, another balance sheet channel operates by affecting cash flow, the difference between cash receipts and cash expenditures

CREDIT VIEW: CASH FLOW CHANNEL

- **Unanticipated Price Level Channel:** Another balance sheet channel operates through monetary policy effects on the general price level.
- Debt is typically contracted in nominal term; change in price level causes a *change in the real-valued of debt contract*, and hence real condition of financial balance sheets.

HOUSEHOLD LIQUIDITY EFFECTS

- Another way of looking at how the balance sheet channel may operate through consumers is to consider liquidity effects on consumer durable and housing expenditures.
- If, as a result of a bad income shock, consumers needed to sell their consumer durables or housing to raise money, they would expect a big loss because they could not get the full value of these assets in a distress sale. (fire sale)
- In contrast, if consumers held financial assets (such as money in the bank, stocks, or bonds), they could easily sell them quickly or their full market value and raise the cash.

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PRACTICAL MONETARY POLICY

- Distributional forecast-inflation target
- Optimal contingent instrument plan

DISTRIBUTIONAL FORECAST TARGETING

- Inflation forecast within “bound” over next 2 years.
- If actual inflation stays in the bound, public has high confidence on central bank; central bank can easily manage expectation of market because of the past success
- But if they missed, they would lose their credibility, which is hard to restore once gone

DISTRIBUTIONAL FORECAST TARGETING

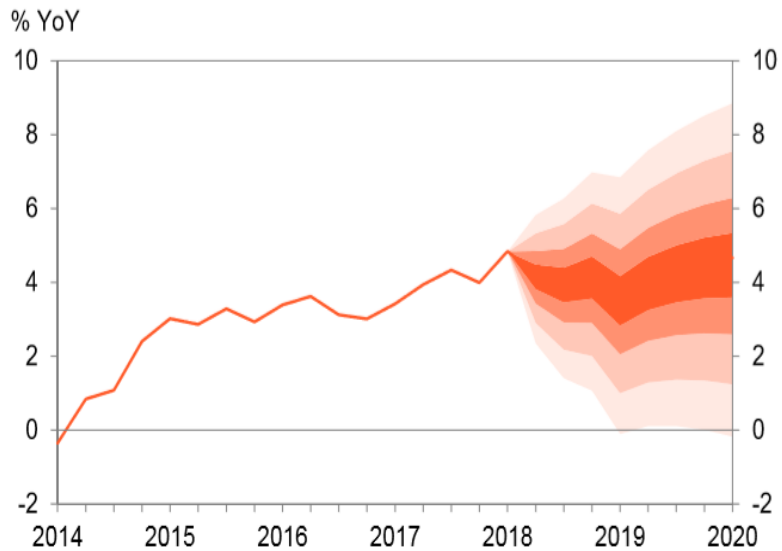
- Facing with several layers of uncertainty, this entails a great degree of risk of making wrong projections
 - Forecast in mean can miss the target!
- Public confidence matters to the effectiveness of policy; central bank ensure the lowest possible risk of having the inflation off the target
- Practically, they do the **fan chart forecasting**

DISTRIBUTIONAL FORECAST TARGETING

- So taking into account the risks; central bank might forecast distribution of inflation
- Public consider this forecast; and make their own judgment about the course of future economy
- It was first introduced by the **Bank of England**
 - Svensson and William (2003) was the first that rationalize this practical conduct from economic point of view; **mean-forecast is not optimal target variable, but distribution is optimal target variable**

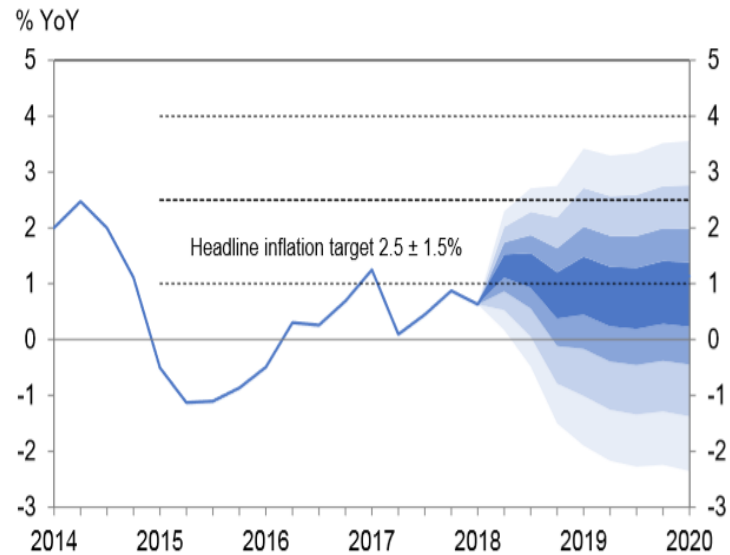
DISTRIBUTIONAL FORECAST TARGETING: EXAMPLE

GDP growth forecast



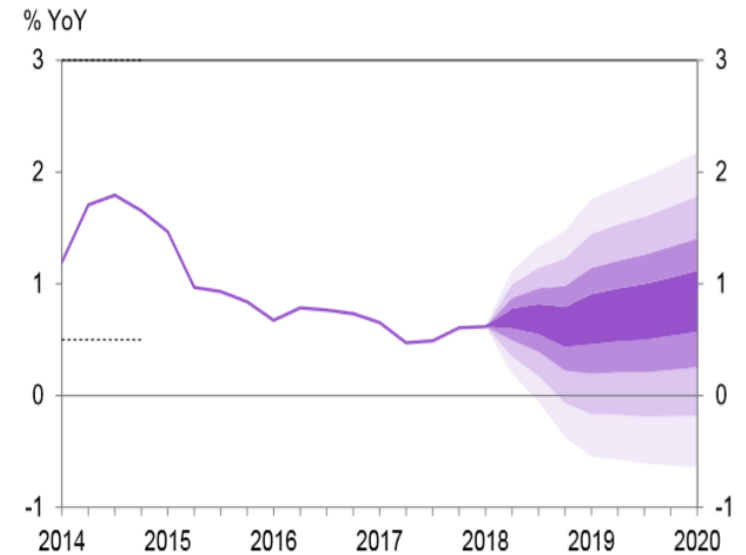
Note: Fan chart covers 90% of the probability distribution

Headline inflation forecast



Note: Fan chart covers 90% of the probability distribution

Core inflation forecast



Forecast as of Q2; June 2018

Source: Press release

OPTIMAL CONTINGENT INSTRUMENT PLANS

- Key success to monetary policy strategy is the transparency of policy; **policy should be predictable**
- Generally, what has worried most to financial market is the trend of policy rate, and hence its timing for the change.
 - E.g. when is the FED going to increase the interest rate?
- Publishing inflation forecast/distribution forecast is good; it helps private sector getting **some senses about the trend of market interest rate**
- But, it might not be enough

OPTIMAL CONTINGENT INSTRUMENT PLANS

- Having looked at fan chart of inflation doesn't tell everything; don't know exactly when central bank is going to do what (need interpretation/communication); ambiguity remained.
- Why don't we release the implied interest path (consistent with forecast of inflation) over the next two years.
- Given this information released, financial sector can easily price in this path into the consideration of pricing, and eliminate policy uncertainty.

OPTIMAL CONTINGENT INSTRUMENT PLANS: SWEDISH EXAMPLE

Figure 1.1. Repo rate with uncertainty bands

Per cent

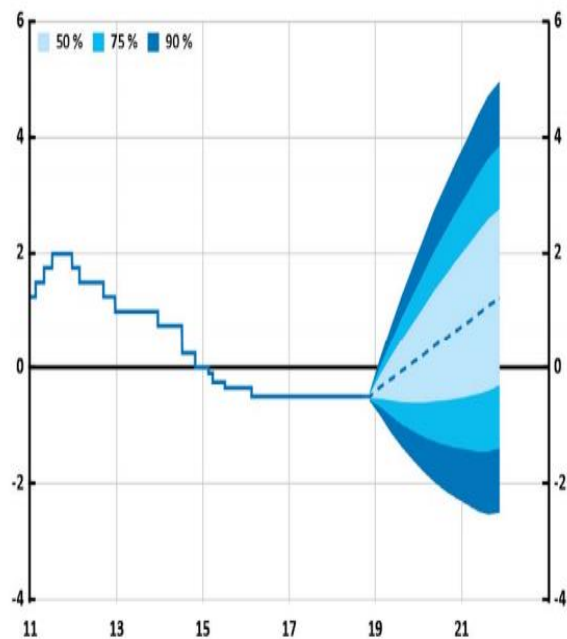


Figure 1.2. GDP with uncertainty bands

Annual percentage change, seasonally-adjusted data

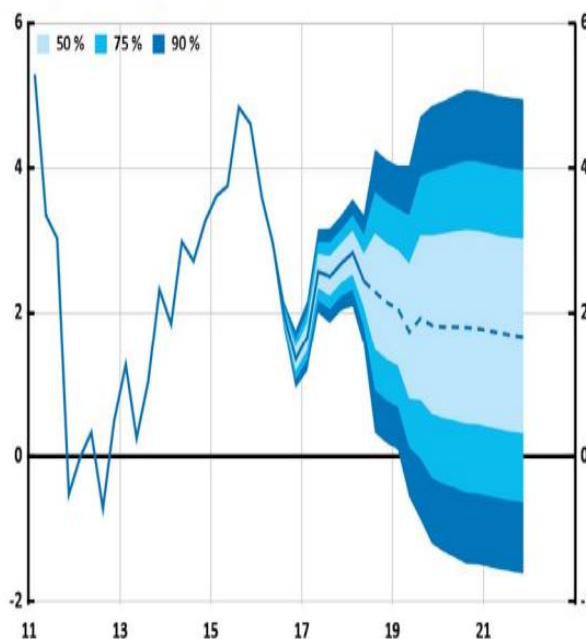
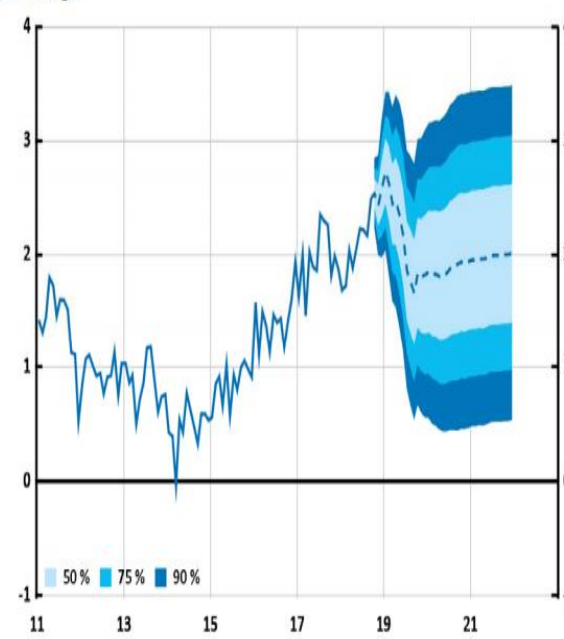


Figure 1.3. CPIF with uncertainty bands

Annual percentage change



Forecast as of Q4; Oct 2018

Source: Press release / Bank of Sweden

OPTIMAL CONTINGENT INSTRUMENT PLANS: USA EXAMPLE

Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, September 2018

Advance release of table 1 of the Summary of Economic Projections to be released with the FOMC minutes

Percent

Variable	Median ¹					Central tendency ²					Range ³				
	2018	2019	2020	2021	Longer run	2018	2019	2020	2021	Longer run	2018	2019	2020	2021	Longer run
Change in real GDP	3.1	2.5	2.0	1.8	1.8	3.0-3.2	2.4-2.7	1.8-2.1	1.6-2.0	1.8-2.0	2.9-3.2	2.1-2.8	1.7-2.4	1.5-2.1	1.7-2.1
June projection	2.8	2.4	2.0	n.a.	1.8	2.7-3.0	2.2-2.6	1.8-2.0	n.a.	1.8-2.0	2.5-3.0	2.1-2.7	1.5-2.2	n.a.	1.7-2.1
Unemployment rate	3.7	3.5	3.5	3.7	4.5	3.7	3.4-3.6	3.4-3.8	3.5-4.0	4.3-4.6	3.7-3.8	3.4-3.8	3.3-4.0	3.4-4.2	4.0-4.6
June projection	3.6	3.5	3.5	n.a.	4.5	3.6-3.7	3.4-3.5	3.4-3.7	n.a.	4.3-4.6	3.5-3.8	3.3-3.8	3.3-4.0	n.a.	4.1-4.7
PCE inflation	2.1	2.0	2.1	2.1	2.0	2.0-2.1	2.0-2.1	2.1-2.2	2.0-2.2	2.0	1.9-2.2	2.0-2.3	2.0-2.2	2.0-2.3	2.0
June projection	2.1	2.1	2.1	n.a.	2.0	2.0-2.1	2.0-2.2	2.1-2.2	n.a.	2.0	2.0-2.2	1.9-2.3	2.0-2.3	n.a.	2.0
Core PCE inflation ⁴	2.0	2.1	2.1	2.1		1.9-2.0	2.0-2.1	2.1-2.2	2.0-2.2		1.9-2.0	2.0-2.3	2.0-2.2	2.0-2.3	
June projection	2.0	2.1	2.1	n.a.		1.9-2.0	2.0-2.2	2.1-2.2	n.a.		1.9-2.1	2.0-2.3	2.0-2.3	n.a.	
Memo: Projected appropriate policy path															
Federal funds rate	2.4	3.1	3.4	3.4	3.0	2.1-2.4	2.9-3.4	3.1-3.6	2.9-3.6	2.8-3.0	2.1-2.4	2.1-3.6	2.1-3.9	2.1-4.1	2.5-3.5
June projection	2.4	3.1	3.4	n.a.	2.9	2.1-2.4	2.9-3.4	3.1-3.6	n.a.	2.8-3.0	1.9-2.6	1.9-3.6	1.9-4.1	n.a.	2.3-3.5

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The June projections were made in conjunction with the meeting of the Federal Open Market Committee on June 12-13, 2018. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the June 12-13, 2018, meeting, and one participant did not submit such projections in conjunction with the September 25-26, 2018, meeting.

1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.

2. The central tendency excludes the three highest and three lowest projections for each variable in each year.

3. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.

4. Longer-run projections for core PCE inflation are not collected.

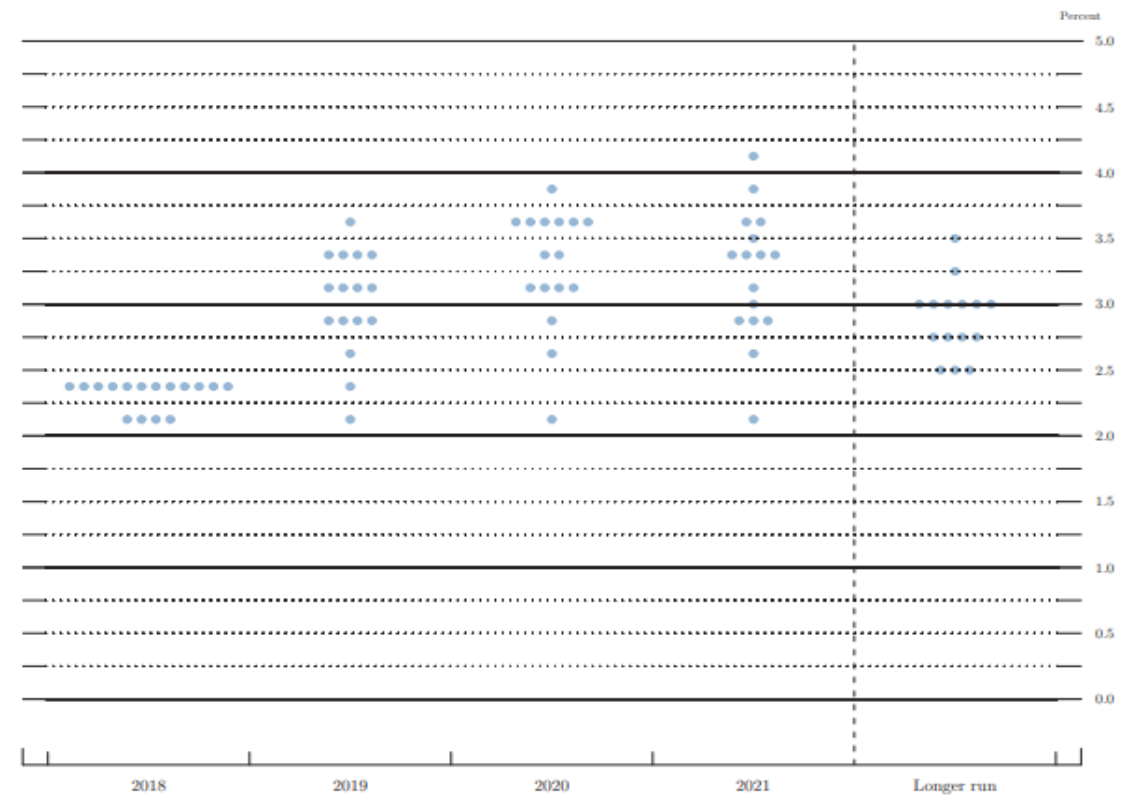
Forecast as of Q3; Sept 2018

Source: Press release / FED

OPTIMAL CONTINGENT INSTRUMENT PLANS: USA EXAMPLE

For release at 2:00 p.m., EDT, September 26, 2018

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



Forecast as of Q3; Sept 2018

Source: Press release / FED