

In the models that we have just explored, there is one key relationship. That key relationship is the Phillips Curve.

The classical models give very limited scope for monetary policy.

This theory says that monetary policy cannot do systematically any better than obtaining the natural rate of unemployment, and it is also dubious as well that a counter-cyclical monetary policy can even stabilize output. By injecting randomness into the economy, however, a random monetary policy is capable of increasing output instability.

The remarkable thing about this way of thinking about the economy is that the model that produces it has multiple situations in which people make exact inflation adjustments.

Here is the first class of such adjustments: insofar as people have *given* inflationary expectations, those expectations are added *exactly* one-for-one into *all* wage and *all* price setting.

The second class of adjustment is that expectations are rational. This says that insofar as inflation will be higher in expected value by a given amount, *all* wage setters and *all* price setters exactly add that amount to their inflationary expectations.

There are two questions in the setting of wages and prices. The first is whether or not inflationary expectations are *exactly rational*, and the second is whether or not, *given expectations*, price setting and wage setting *exactly* compensate for those price and wage expectations.

We can see both of those in the standard Phillips curve of Lucas and Sargent.

In terms of the Phillips Curve from Lucas and Sargent and also from standard natural rate theory:

$$\pi_t = \beta (U^* - U_t) + \pi_t^e, \text{ where } U^* \text{ is the natural rate of unemployment.}$$

$\pi_t^e$  behaves exactly according to rational expectations, which is something that anyone but an economist would doubt.

*And*, in addition, insofar as wage and price setters have inflationary expectations their wage and price setting *exactly* takes that into account and adds it in.

The coefficient of  $\pi_t^e$  is exactly one.

This might be reasonable in a case where there is only one price setter, as in these models.

These models are *representative agent* models where there is one agent who is making a *single* price setting decision.

But, remarkably, they believe that this *full offset* occurs in the full economy.

That economy has millions of people involved in wage setting and price setting and these representative agent models are said to represent the *equilibrium* of these millions of wage and price setters, with each wage and price setter taking account of every other wage and price setter and expecting all of these *other* people in the economy to make the exact same inflationary offset.

So theory has shown us an interesting possibility.

But that theory rests upon *much* shakier ground than the textbooks would have us believe.

One way to test the theory is to estimate wage and price Phillips Curves and see whether the coefficient on expected inflation is one.

Typically, people have assumed that expected inflation is a moving average of lagged inflation, so that the test would be whether or not the sum of coefficients on lagged inflation is (or is not) significantly different from one.

There are two problems with such tests.

The first problem is that:

You can come up with specifications whose econometric estimations yield coefficients on lagged inflation whose sum is significantly less than one.

But even that result is not decisive: If the monetary rule produces inflation that is mean reverting, one should in fact get coefficients on lagged inflation that sum to less than one in the presence of rational expectations.

This theoretical result is due to Sargent.

FOOTNOTE: There is an assertion that Phillips estimated the Phillips Curve right. That is right for his period. In the Gold Standard period prices would be mean reverting, and therefore with rational expectations the sum of coefficients on past inflation would be less than one. But in later periods, with something like the Taylor rule, inflation would not be mean reverting, and therefore it is correct to model the sum of the coefficients on lagged inflation as summing to one. END

## FOOTNOTE

Then there is the second problem.

If course there are also specifications where the estimated coefficients on lagged inflation sum to one.

I also believe that the standard errors are very large, so that these estimates also fail to reject coefficients that are less than one so that there would be economically significant trade-offs between unemployment and output.

I also think that economists have tended to report tests of that “accept” a coefficient of one, and not to report those that reject because the theory says that the coefficient *should be* one.

So that takes us to today’s lecture.

It goes over some articles that ask whether wage setting and price setting behavior really does behave according to economists’ models.

The studies that I am going to quote indicate that wage and price setting do not *fully* conform to economists’ models.

People say that there are problems with the studies that I am going to report.

I agree that there are problems, but also think that this means that these studies pose a promising area for research.

I have been surprised that people have not worked more in this area.

I talked to the author of one of them a few years ago.

He told me that he was not a macroeconomist and had not understood that his findings were all that important.

Lucas and Sargent, and others assume that people do not have money illusion. They make their bargains, or deals or whatever, only with the *real* features of those bargains or deals or trades, in mind.

The studies that I am going to review test the empirical proposition that people have or do not have money illusion.

My guess is that most *micro-economists* or labor economists would have a fairly easy time believing that there is some degree of money illusion.

But it seems that most *macro-economists* think that you *should not* make models with money illusion.

At the end of the lecture I am going to also give you another way of looking at things that is much more controversial.

That is an approach to macroeconomics based on sociological theory.

Let me now begin with the psychological approach.  
That is motivated by the work of Daniel Kahneman, who is a psychologist.

One of Danny's first contributions to economics has been the notion that one can tease out people's true motivations by asking them clever questions.

He is a leading cognitive psychologist.

In general, cognitive psychologists believe that decision makers act like intuitive scientists: they create simplified models of decision problems, and base their decisions upon those models.

Those knowledge structures have been given a variety of names. They are called schemas, frames, nuclear scenes and prototypes.

Cognitive psychologists have cleverly teased out the nature of these "frames," by showing situations in which framing leads to cognitive error.

There is a very nice book on this, *Human Inference*, by Richard Nisbett and Lee Ross.

Danny has been especially insightful about showing the crazy things that people believe by posing the exactly right question.

Let me begin with a review of the classic article on this by Kahneman, Knetsch and Thaler that is on the reading list.

In general, what this article showed is that *economists'* view of what people do in economic transactions does not correspond to the public's view of fairness.

There is a discrepancy between what the public thinks is *fair* and the *maximizing* actions that economists think that people do.

This is especially true in labor markets.

Kahneman, Knetsch and Thaler do an interview study.

I will give you the *flavor* of that study by reading a few of the questions, with the corresponding responses.

Interviewees are told about a situation.

Then they are asked whether some action taken in this situation is *fair* or *unfair*.

Here is the classic Kahneman, Knetsch, Thaler question.

**Question 1.** A hardware store has been selling shovels for \$15.00.

The morning after a large snowstorm the store raises the price to \$20.00.

Respondents reacted to the question in the following proportions:

18 % thought it would be "acceptable."

82 % thought that it was "unfair."

The question illustrates both the method and the major theme of the study. Respondents evaluate the fairness of an action in which a firm takes advantage of a legal opportunity to increase its profits.

Many of the *strategems* in *microeconomics courses* involve complicated contracts that would probably be considered *unfair*.

This is a macroeconomics course.

Wage—and also price setting—setting are at the heart of the subject.

Wage setting was key to the neutrality result of Lucas and Sargent.

The coefficient of one on inflationary expectations in the Phillips Curve is crucial to natural rate theory.

The existence of some nominal rigidity was crucial to Taylor's model.

And, relevant to next Tuesday's class, the easiest explanations for unemployment is that considerations of fairness cause wages to be too high to clear labor markets.

So I will focus on the questions regarding wage and price setting.

Here is a question involving wages.

**Question 2A.**      A small photocopying shop has one employee who has worked in the shop and earns \$9.00 per hour. Business continues to be satisfactory but a factory in the area has closed and unemployment has risen.

Other small shops have now hired reliable workers at \$7 an hour to perform jobs similar to those done by the photocopying employee.

*The owner of the photocopying shop reduces the wage to \$7.00.*

|              |            |       |
|--------------|------------|-------|
| Respondents: | Acceptable | 17 %  |
|              | Unfair     | 83 %. |

The next question is the same except for the ending, which is different:

The new ending is:

The current employee leaves and the owner decides to pay a *replacement* \$7.00 an hour.

This time we see:

|              |            |       |
|--------------|------------|-------|
| Respondents: | Acceptable | 73 %  |
|              | Unfair     | 27 %. |

Here is a variant on that theme.

**Question 3.** A house painter employs two assistants and pays them \$9 an hour. The painter decides to quit house painting and go into the business of providing landscape services where the going wage is lower. He reduces the workers' wages to \$7 per hour for landscape work.

Respondents:      Acceptable    63 %  
                         Unfair            37 %.

*Let me give another.*

**Question 16.** A business in a community with high unemployment needs to hire a new computer operator. Four candidates are judged to be completely qualified for the job. The manager asks the candidates to state the lowest salary they would be willing to accept, and then hires the one who demands the lowest salary.

Respondents:      Acceptable    36 %  
                         Unfair            64 %.

I am now going to give you some potential examples of *money illusion* or *nominal wage stickiness*.

**Question 4A.** A company is making a small profit. It is located in a community experiencing a recession with substantial unemployment, but *no inflation*. The company decides to decrease *wages* and *salaries* by 7 per cent this year.

WRITE DOWN:    inflation        = 0  
                          $\Delta w/w$         = - 7 %

Respondents:      Acceptable    37 %  
                         Unfair            63 %.

*Now contrast this with the following alternative.*

**Question 4B.** The same question is asked, except that inflation is 12 %, rather than 0.  
*And the company decides to increase salaries and wages by only 5%.*

WRITE DOWN:    inflation        = 12 %

$$\Delta w/w = 5 \%,$$

Respondents:      Acceptable    78 %  
                          Unfair            22 %.

This may be the single best piece of evidence in favor of *money illusion*.

A similar bit of evidence in favor of money illusion is the empirical *absence* of money wage cuts where they would have been expected.

Empirically, reductions in *money wages* are very rare.  
 Changes of union wages in Canada when inflation was very low had a huge spike exactly at zero wage change.  
 Truman Bewley studied wages set in Connecticut in the 1991-92 recession.  
 He found that private employers sometimes make money wage cuts, but only after they have lost money for some time.

Let me give you another example from Kahneman, Knetsch and Thaler.

**Question 6A.**      A small company employs several people. The workers' incomes have been about average for the community. In recent months business for the company has not *increased* as it had before. The owners *reduce wages* by 10 percent for the next year.

Respondents:      Acceptable    39 %  
                          Unfair            61 %.

Compare this with the same question, but with a different ending:

**Question 6B.**      *The workers have been receiving a 10 percent annual bonus and the company eliminates the bonus.*

Respondents:      Acceptable    80 %  
                          Unfair            20 %.

These contrasting answers are not indicative of money illusion.  
 A wage is implicitly not temporary, whereas *at least implicitly*, a bonus is a *temporary, contingent* payment.

Here is another question about *wage stickiness*. There are two paired questions. *Here is version 1.*

**Question 9A.**      A small company employs several workers and has been

paying them average wages. There is severe unemployment in the area and the company could easily replace its current employees with good workers at a lower wage.

This is *ending 1*.

*The company has been making money. The owners reduce the current workers' wage by 5 %.*

|              |            |       |
|--------------|------------|-------|
| Respondents: | Acceptable | 23 %  |
|              | Unfair     | 77 %. |

*Question 9B.* This is *ending 2*.

*The company has been losing money. The owners reduce the current workers' wage by 5 %.*

|              |            |       |
|--------------|------------|-------|
| Respondents: | Acceptable | 68 %  |
|              | Unfair     | 32 %. |

This, of course, corresponds to Bewley's findings.

Let me now turn to another paper that is clearly motivated by Kahneman, Knetsch and Thaler.

Kahneman, together with Amos Tversky, has been probably the leading cognitive psychologist in teasing out the idea that people make cognitive errors.

The models that people have as intuitive scientists are not the models that they should have.

To economists money illusion is a cognitive error.

A very nice paper, which is both on your reading list and also in your reader is by Shafir, Diamond, and Tversky, who have teased out the nature of the frames involved in monetary values in economic transactions.

In contrast to economic rationality, Shafir *et al* show the existence of frames that are jointly in both nominal and in real terms.

Insofar as decisions are different because they are framed in nominal rather than in real terms, economists would judge economic actors to be making cognitive errors.

*Those are* the types of errors that cognitive psychologists have found to be common in other contexts.

I will go over one of the examples in their paper and leave another in the notes.

Shafir, Diamond, Tversky paper.

The first example.

Subjects were given the following vignette, concerning two recent college graduates.

Consider two individuals, *Ann* and *Barbara*, who graduated from the same college a year apart.

Upon graduation, both took similar jobs with publishing firms.

Ann started with a yearly salary of \$30,000.

PUT ON BB

| ANN           | BARBARA         |
|---------------|-----------------|
| \$30,000      | \$30,000        |
| inflation = 0 | inflation = 4 % |
| 2 % raise     | 5 % raise       |

During her first year on the job there was no inflation, and in her second year Ann received a 2% (\$600) raise in salary.

Barbara also started with a salary of \$30,000.

During her first year on the job there was 4% inflation, and in her second year Barbara received a 5% (\$1500) raise in salary.

Three separate groups of respondents were then asked:

which of the two was doing better in economic terms;

who was happier;

and who would be more likely to leave after receiving an outside job offer.

|                         | ANN | BARBARA |
|-------------------------|-----|---------|
| BETTER OFF ECONOMICALLY | 71  | 29      |
| HAPPIER                 | 35  | 65      |
| MOST LIKELY TO STAY     | 36  | 64      |

How do Shafir, Diamond and Tversky interpret these responses?

They view them as evidence that, despite subjects' understanding of the meaning of real income, they nevertheless also base some of their judgments in nominal terms. Their view is that their subjects have a mixed view about *real vs. nominal* calculations. Not all thinking about such things as wages and salaries is done with a real frame.

Of course that should be the case.

People really change their mental frames by learning economics.

One of those mental frames that economists try to push on people is that calculations about such things as wages, salaries and prices should be in *real*, not in nominal terms.

\*\*\*\*\*

Here is another similar vignette from Shafir, Diamond and Tversky.

**Problem 7.**

Ablex and Booklink are two publishing firms, each employing a dozen editors. Because the firms are small, unequal raises in salary can create morale problems. In a recent year of no inflation, Ablex gave  $\frac{1}{2}$  its editors a 6 % raise in salary and the other  $\frac{1}{2}$  a 1 % raise. The following year there was a 9 % inflation, and Booklink gave  $\frac{1}{2}$  its editors a 15 % raise in salary and the other  $\frac{1}{2}$  a 10 % raise.

In which firm do you think that there were likely to be more morale problems?

|           |              |      |
|-----------|--------------|------|
| RESPONSE: | Ablex        | 49 % |
|           | Booklink     | 8 %  |
|           | Same in both | 43 % |

Suppose that an editor received the lower raise in each firm was then offered a job in a competing company. Which editor do you think was more likely to leave their present position for another job?

|           |                                                     |      |
|-----------|-----------------------------------------------------|------|
| RESPONSE: | The editor who received the lower raise in Ablex    | 57 % |
|           | The editor who received the lower raise in Booklink | 5 %  |
|           | The two were equally likely                         | 38 % |

I think that this might be a fruitful area of research. This is a very fine paper, but I also think that some of their other examples are not very discriminating.

Also, even these two examples are not 100 % watertight, at least to an economist. If the high inflation is due to an oil shock, which will not be neutral, rather than a money shock which should be neutral, people should be quite grateful for raises since they should be taking real wage cuts.

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Let me now review the study by Bob Shiller which is on the reading list and also in the reader.

**This is an interview study with respondents in the United States, Germany and Brazil.**

**Its title is “Why Do People Dislike Inflation?”**

**The standard view of rational expectations is that the public has the same model of the economy as economists.**

**And then to form expectations, they just apply that same model.**

**Shiller’s interviews about why the public dislikes inflation suggest that they have a very different model of the economy than economists.**

**In particular non-economists tend to attribute their wage increases even in the presence of inflation to their own efforts. Therefore their view is that when inflation occurs, it takes away from the real wage (salary, income) that they would have *otherwise* received.**

**Bob took three separate questionnaires.**

**First, there was a short questionnaire with open-ended questions.**

**This is Questionnaire A.**

**The second questionnaire elicited the difference between popular views of inflation and economists’ views. This was Questionnaire B. And then Questionnaire C, elicited international differences between residents of the U.S., Brazil and Germany.**

**The most interesting answers are to Questionnaire B, so I will just briefly describe Questionnaire A.**

**I will give some of the open-ended questions:**

**Do you think controlling inflation should be a high priority?**

**Answer: everyone does.**

**Do you find inflation interesting?**

**People do.**

**Do you worry about inflation?**

**Everyone does.**

**Do you get angry when prices rise?**

**People tend to.**

Here is a direct question on Questionnaire A.

Try to imagine how things would be different if the United States had experienced higher inflation over the last five years. How different do you think your income (the total dollars earned in a month) would be in comparison with your actual income, if we had had higher inflation.

My income (in dollars per month) would be

|                       |      |
|-----------------------|------|
| <i>lower</i>          | 28 % |
| <i>about the same</i> | 35 % |
| <i>higher</i>         | 31 % |
| <i>no opinion</i>     | 6 %. |

Why do people give this crazy answer? There is the possibility that they think that inflation is bad, occurs only in bad times, and therefore they will have *lower* wages.

ERASE BB

Let's now compare the opinion of the public to the opinion of economists on some other questions.

PUT ON BB:

|             |   |           |   |                     |
|-------------|---|-----------|---|---------------------|
| 1           | 2 | 3         | 4 | 5                   |
| Fully Agree |   | Undecided |   | Completely Disagree |

US ALL

Economists

Do you agree that preventing inflation is an important national priority, as important as preventing drug abuse or preventing deterioration in the quality of our schools?

There is a big difference between people and economists. FILL IN NUMBERS.

|             |   |           |   |                     |
|-------------|---|-----------|---|---------------------|
| 1           | 2 | 3         | 4 | 5                   |
| Fully Agree |   | Undecided |   | Completely Disagree |

|            |    |    |    |    |    |
|------------|----|----|----|----|----|
| US ALL     | 52 | 32 | 4  | 8  | 4  |
| Economists | 18 | 28 | 11 | 26 | 18 |

Of course if you had answered the first question that you thought you would have gotten no increase in wages in the presence of high inflation then this is the correct answer to this question. The two answers by the public seem to be consistent.

## ERASE NUMBERS

Do you agree with the following statement?

“If the government were to make a mistake next year, such as printing too much money, and creates prices that are 20 % higher than they are today, I think they should try to reverse their mistake and bring prices back down to where they are today.”

|            |                  |    |                |    |                          |
|------------|------------------|----|----------------|----|--------------------------|
|            | 1<br>Fully Agree | 2  | 3<br>Undecided | 4  | 5<br>Completely Disagree |
| US ALL     | 46               | 22 | 22             | 4  | 6                        |
| Economists | 0                | 3  | 5              | 28 | 64                       |

I do not even have a guess what is on people's minds when they give this answer.

## ERASE NUMBERS BUT NOT CHART

### PUT ON BB

|   |        |            |
|---|--------|------------|
|   | US ALL | Economists |
| 1 |        |            |
| 2 |        |            |
| 3 |        |            |

Which cause comes closest to your great gripe about inflation?

1. Inflation causes a lot of inconveniences. I find it harder to comparison shop, I

feel I have to avoid holding cash, etc.

2. Inflation hurts my real buying power. It makes me poorer.

3. Other

**FILL IN NUMBERS**

|          | <b>US ALL</b> | <b>Economists</b> |
|----------|---------------|-------------------|
| <b>1</b> | <b>7</b>      | <b>49</b>         |
| <b>2</b> | <b>77</b>     | <b>12</b>         |
| <b>3</b> | <b>15</b>     | <b>40</b>         |

**ERASE VALUES IN MATRIX ADD LINE 4.**

Please evaluate which of the following theories about the effects of general inflation on wages and salary relates to your own situation.  
There are 4 options.

Number 1. The price increase will create extra profits for my employer who can now sell output for more; there will be no effect on my pay.

Number 2. Competition among employers will cause my pay to be bid up. I could get outside offers from other employers, and so, to keep me my employer will have to raise my pay too.

Number 3. A sense of fairness and proper behavior will cause my employer to raise my pay.

Number 4. None of the above. No opinion.

|          | <b>US ALL</b> | <b>Economists</b> |
|----------|---------------|-------------------|
| <b>1</b> | <b>26</b>     | <b>4</b>          |
| <b>2</b> | <b>11</b>     | <b>60</b>         |
| <b>3</b> | <b>21</b>     | <b>11</b>         |

### ERASE NOS. IN AGREE/DISAGREE CHART

Footnote: The answers by economists are truly remarkable since probably most of the respondents are probably in tenured positions where they could not get outside offers. Therefore this is *not* the competitive market that they imagined. There could be a paper in this showing just how unreasonable the economists are. End footnote

Here is another agree/disagree.

When I see projections about how many times more a college education will cost or how many times more the cost of living will be in coming decades I feel a sense of uneasiness: these inflation projections really make me worry that my own income will not rise as much as such costs will.

|            | 1<br>Fully Agree | 2  | 3<br>Undecided | 4  | 5<br>Completely<br>Disagree |
|------------|------------------|----|----------------|----|-----------------------------|
| US ALL     | 66               | 20 | 7              | 6  | 1                           |
| Economists | 5                | 15 | 9              | 30 | 41                          |

### ERASE NUMBERS

Footnote: Economists in academic institutions should rejoice at how much more this college education is going to cost. That increase in costs is *our* salary increases. End Footnote

Here is another.

Do you agree with the following statement?

I think if my pay went up I would feel more satisfaction in my job, more sense of fulfillment, even if prices went up as much.

|        | 1<br>Fully Agree | 2  | 3<br>Undecided | 4  | 5<br>Completely<br>Disagree |
|--------|------------------|----|----------------|----|-----------------------------|
| US ALL | 28               | 21 | 11             | 14 | 27                          |

|            |   |   |   |    |    |
|------------|---|---|---|----|----|
| Economists | 0 | 8 | 3 | 13 | 77 |
|------------|---|---|---|----|----|

Do you agree with the following statement?

Footnote: people may expect an increase in *real* pay both for seniority as they are getting older and more experienced and also because of general productivity increase elsewhere in the economy. The economists may be taking this into account. The interpretation of the question assumes that the public is not taking this into account, and of course they probably are not. Such difference could result in some of the differences between economists and the public. End footnote

NOTE: SKIP IF NOT ENOUGH TIME

One of the most important things that I don't like about inflation is that the confusion caused by price changes enables people to play dirty tricks on me at my expense. For example my boss can "forget" to raise my pay, and if she does, then I am taking a real pay cut. The government can "forget" to change the tax bracket, and so I wind up paying more taxes.

|            | 1<br>Fully Agree | 2  | 3<br>Undecided | 4  | 5<br>Completely<br>Disagree |
|------------|------------------|----|----------------|----|-----------------------------|
| US ALL     | 51               | 21 | 11             | 11 | 6                           |
| Economists | 28               | 33 | 9              | 16 | 15                          |

END SKIP

I have reviewed these papers so far because they present a different view of macroeconomics.

For example Shiller's paper suggests that people really do have the *wrong* macro model of wage determination.

Also these papers collectively demonstrate a new methodology in macroeconomics beyond modeling and econometrics.

At the beginning of the lecture I gave you the standard *psychology and economics* interpretation of these differences between the answers given by the economists and the answers given by the US public.

That interpretation is that members of the public are intuitive scientists. And their model of the economy, their mental frame, is different from the economists.

They have money illusion in this mental frame.

They have money illusion largely because they fail to understand the general-equilibrium nature of the inflationary process, but perhaps for other reasons as well.

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Let me now take just a few minutes to give you my own personal perspective on the results that economists are obtaining.

This contains comments first on rational expectations theory, which has the very strong result that systematic monetary policy cannot even stabilize output.

But it also applies to natural rate theory. Natural rate theory, to recall, says that if policy makers try to keep the unemployment rate below the natural rate there will be accelerating *inflation*.

If they try to keep the unemployment rate above the natural rate there will be accelerating *deflation*.

There are important consequences of this.

In Europe the ECB is keeping unemployment very high with very low inflation targets.

In Canada, such policies occurred, with very high unemployment throughout the 1990's.

These policies are the result of the standard textbook economics that you learned in your previous macroeconomics course.

There is a good chance that that standard economics is a sufficiently poor approximation to reality that it gives a bad guide to policy.

I am now going to give you a somewhat different version of the reasons why the classical economists such as Lucas and Sargent with rational expectations, and also Friedman with natural rate theory are getting such strong results.

A source for this is my presidential address to the American Economic Association.

Sociology gives a different perspective on this. The sociological view is consistent with the psychological view, but in my opinion is much less *ad hoc*.

After he finished working on economics Vilfredo Pareto wrote a book on utility functions called *The Compendium*.

*The Compendium* is unreadable but it has been summarized by George Homans in a book called *Introduction to Pareto*. Homans was a great sociologist.

I am now going to interpret Pareto for you, especially in the context of macroeconomics.

Pareto said that people not only have utility for things like consumption goods and leisure.

They also have a whole list of ways in which they think the world *should be*.

The world is full of *shoulds and should nots*.

Economists themselves have a million *shoulds and should nots*.

These *shoulds* are more important to us usually than any thing concrete.

For example, I think that most people in this class think that *they should get a Ph.D.*

In fact what we have here is a whole factory that not only teaches you how to get a Ph.D., but also induces you *to want to get a Ph.D.*

Those of you in your first year here must especially feel that.

These notions of what you should do or what you should not do are as important motivations for most people as the desire for economic gain.

Because they are important goals economists have no choice.

According to our methodology, if we are going to analyze economic problems right then they have to be in the utility functions that people are maximizing.

Let's return to Pareto.

A general model that incorporates his notions of *should and should not* is that people's utility functions have two components.

I will call the first of these components U.

I will call the second component V.

The U consists of all those familiar economic arguments.

The V, however, takes into account all of the *shoulds*.

The incorporation of these *shoulds* or *should nots* is the central idea of sociology.

Sociologists call this part of the utility function *norms*.

Sociologists say that behavior depends critically upon what they call *the situation* or what psychologists would call the *frame*.

And how people perceive *the situation* determines what *shoulds* are going to enter the V part of the utility function.

Let's now apply this to macroeconomics.

We should all agree that the U part of people's utility should have no money illusion.

U only concerns the real economic considerations.

Insofar as that is the only part of the utility function then all of the results of natural rate theory and rational expectations theory should go through.

But how about the V component of utility?

Suppose that V contains money illusion. If V is an important component of people's motivation and also contains money illusion, then natural rate theory and rational expectations theory give the wrong theoretical basis for macroeconomic policy.

I will give you three examples of money-illusion *shoulds* that probably enter V.

1. *My employer should not give me a money wage cut.*

We have evidence of that in Kahneman, Knetsch and Thaler, and also in Shiller.

And, empirically, in the wild, there is a great deal of evidence that employers resist giving money wage cuts because their employees have a strong aversion to them.

Bewley found that his Connecticut employers believed strongly that they *should not give wage cuts*.

Likewise their employees felt that they should not *take wage cuts*.

Once there is money illusion which says that people think they *should not take*

wage cuts then the Phillips Curve will no longer be vertical, especially at low inflation because economic considerations alone will call for nominal wage cuts, but the firms will desist because of worker resistance.

Here is a second possible source of nominal illusion. Workers believe that:

*2. My employer should give me a nominal wage increase unless times are very bad.*

Such a belief would account for the difference between economists' understanding about the difference between Barbara and Ann.

Remember Shafir, Diamond and Tversky's Barbara and Ann.

The public *understood correctly* that Ann was better off than Barbara.

They got the economics right.

But the public also thought that Barbara would be happier.

They thought that Barbara would be happier because she got a higher *nominal* raise.

Economists think that the public has made a *logical contradiction*.

But the public's responses are consistent with the view that they think that Barbara and Ann think they *should get* a nominal wage increase.

We see the same phenomenon in Shiller's similar question.

Economists have been taught that utility functions should not have a *V* component.

Especially they should not have a *V* component with money illusion.

So they answered that they would *not* be happier if inflation were higher and their money wage went up as much.

But a full 49 percent of the general public thought that they would be happier. *And* an additional 11 percent were undecided.

In contrast, 77 percent of economists *completely* disagreed. And an additional 13 percent of economists disagreed, but less strongly.

Has the public given the correct answer that they would, indeed, be happier? I think that they gave the correct answer because they think that they *should* receive a nominal raise.

And therefore they are happier when it occurs than when it does not, even though it is exactly matched by inflation.

The result of this is again a Phillips Curve without a natural rate, in which there is a long-run trade-off between inflation and unemployment.

Let me give you one more money-illusion *should*.

Most customers believe that:

**3. Sellers should not raise prices.**

I think that this means that when sellers increase their *nominal* prices by more that people become more unhappy and tend to look for other options.

This means that demand is going to be more elastic at higher rates of inflation. That will make firms' desired price relative to that of their competitors lower when inflation is higher. And that will reduce the rate of unemployment.

The injection of each these *shoulds*, each of which has money illusion leads to a long-term trade-off between inflation and unemployment.

The sociological approach to macroeconomics, coupled with questionnaire results that are consistent, then gives a very different view of macroeconomics.

Economists should not believe as dogmatically as they do in standard natural rate theory.

There are theoretical reasons why they are likely to be quite wrong.