



**A DIALOGUE WITH NOBEL LAUREATE ERIC MASKIN:
SUCCESSFUL NEGOTIATING AND
FINANCIAL TECHNIQUES FOR
DEALMAKING, INVESTMENT & LAW**

**DIRECTORS ROUNDTABLE
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New York**

The Directors Roundtable is conducting a worldwide series of events with Nobel Laureates in Economics. At this program, Laureate Eric Maskin of Harvard makes the Keynote Address on the application of economic techniques, including game theory, to issues such as privatization of public assets and the provision of public goods and services. Professor Maskin is joined in a Roundtable discussion with Distinguished Panelists from Merrill Lynch, Shearman & Sterling LLP, and the Directors Roundtable. They provide valuable insights for Directors, C-suite executives and investors, combining theory and practice for more successful results in challenging markets. The topics include investing strategies and negotiating M&A deals; contracts; legal settlements; wireless spectrum auctions; pricing; single buyers versus competitive bidding; and more.

The Directors Roundtable is a civic group which organizes the preeminent worldwide programming for Directors and their advisors including General Counsel.



KEYNOTE SPEAKER:

Prof. Eric Maskin

Adams University Professor, Harvard University,
Nobel Laureate in Economics

DISTINGUISHED PANELISTS:

Ashvin Chhabra

Chief Investment Officer and Head of Investment
Management and Guidance, Merrill Lynch Private
Banking & Investment Group

John A. Marzulli, Jr.

Partner and member of Shearman & Sterling LLP's
Mergers & Acquisitions Group

Jack Friedman (Moderator)

Chairman, Directors Roundtable; author of articles
in *The Wall Street Journal* and *Barron's* on bonds,
limited partnerships, and legally troubled assets

(The biographies of the speakers are presented at the end of this transcript. Further information about the Directors Roundtable can be found at our Website, directorsroundtable.com.)



Dr. Eric Maskin



Ashvin Chhabra



James Marzuli

TRANSCRIPT

JACK FRIEDMAN: Good morning. I am Jack Friedman, Chairman of the Directors Roundtable. We are a civic group that has organized 800 events over 23 years in 14 countries. Our purpose is to conduct programs for the broader business community; and make the finest thinking available for Directors and their advisors.

This event is part of a series with Nobel Laureates in Economics. We started with a program in 2012 at Harvard Business School, and this is the fourth in the series. The full-color transcript of the program will be made available electronically to about 500,000 leaders nationally and globally.

We will begin with Professor Eric Maskin of Harvard, who will talk about mechanism design and game theory. I will mention one thing in his bio which is inspiring. I find it interesting that his research has so many applications in the real world, it is not purely mathematical. As a note, when he was at Princeton, he lived in the same house that Einstein did.

Second, we will have a discussion of dealmaking and negotiations from John Marzulli. We want to thank John and his firm, Shearman & Sterling, for their wonderful hospitality here. Your staff has done an incredible job.

Then we will hear from Ashvin Chhabra, who is a senior executive with Merrill Lynch Wealth Management, which has been a sponsor of the events in this series. Ashvin has an economics/stock market/management background, and worked at Princeton when Professor Maskin was there.

Finally, we will have a broader discussion among the speakers with questions from the audience at the end.

Without further ado, I would like to introduce our Keynote Speaker, Professor Eric Maskin of Harvard University, and a Nobel Laureate. Thank you.

PROF. ERIC MASKIN: Thank you very much, Jack. Thank you all for coming out this morning.

I'd like to spend a few minutes this morning telling you about a subject I've spent a lot of my career on, "mechanism design." First, I'll give a definition of the subject, but if you're like me, general definitions don't really mean very much, and so I'll quickly turn to a couple of examples which will best illustrate what mechanism design is all about.

Briefly, "mechanism design" is the reverse engineering part of economics. Most economists spend their time looking at existing economic institutions and trying to say what outcomes these institutions are likely to generate. This is what we call the "predictive" or "positive" part of economics, and it's about ninety percent of the field. I'm particularly interested in the remaining 10%, where we reverse the direction. That is, in mechanism design, we start with the outcomes. We say, "These are the outcomes we would like to have," and we work backwards to ask whether it would be possible to create institutions or mechanisms or games that would result in those outcomes. If the answer is "yes," then we want to know what form those mechanisms or institutions take. This is the normative or "prescriptive" part of economics.



Now, this may not mean very much to you—it's all a little bit abstract. So, let's look at a very simple example. Imagine that you are a mother and you have two children, Bob and Alice.

You have a cake that you want to divide between the two kids, and your goal, as a mother—as a mechanism designer—is to make sure that each child is happy with the piece that he or she receives. That means that Bob should think that *he's* got at least half the cake, and Alice should think that *she's* got at least half the cake. This is what we call a fair division outcome. And if your house is anything like mine, not achieving a fair division outcome is a disaster for the household.

How does the mother ensure that a fair division is reached? If she knows that the kids see the cake the same way that she does, there's a simple solution: she takes a knife, she cuts the cake exactly in half, and she gives each kid one of the pieces. Because she believes that the cake has been divided exactly in half, and we're assuming the kids see it the same way. They will think they've each got half, too—and that's the end of the story.

The problem is that, in reality, kids never see things the way their mother does. She may think that she has divided it equally, but Bob may think that Alice's piece is bigger. In fact, he probably *does* think that Alice's piece is bigger, and quite possibly, Alice thinks *Bob's* piece is bigger.

Here is the mechanism design problem: the mother wants to achieve a particular outcome, a fair division, but she doesn't have enough information to do this on her own. She doesn't know how the kids view the cake. The question is: can she nevertheless design a mechanism, a procedure, that will result in a fair division?

It turns out that what I've described is actually a very old problem; it's literally thousands of years old. It's even discussed in the Old Testament; there's a passage where Lot and Abraham are discussing the fair division of grazing land between them. This is exactly the same as the cake problem. As is often the case, the Bible also gives the solution to the problem, and as you'll see—in fact, you probably, many of you have probably already anticipated the solution, because it's used a lot in practice—it's remarkably simple.

What the mother should do is to have one of the kids—say, Bob—divide the cake in two, and have the other child—Alice—choose whichever piece she wants for herself.

I claim that this procedure solves the mother's problem. Here's why: When Bob is cutting the cake, he has a strong incentive to cut it so that the pieces are exactly equal. Why? Because if one of the pieces is bigger, he knows Alice is going to take that one, and he'll be left with the smaller piece. So he wants to cut the cake in such a way that whichever piece Alice takes, he will be happy with the other one. That means he will be happy. And Alice will be happy, because she gets to choose her favorite piece. A very elegant, very clever solution to what might have seemed an intractable problem.

Now, you may say, "What's the big deal? — This is only cutting a cake, and not the most serious problem in the world." Indeed, it's not a terribly serious problem, but nevertheless, it's already rich enough to illustrate some of the key features of mechanism design theory. The first point is that the mechanism designer/mother, doesn't know, in advance, what an optimal outcome is, because she is missing critical information and so has to proceed indirectly through a mechanism. In this case, the mechanism is the "divide and choose" procedure. In effect, the

participants, themselves—Alice and Bob—generate the information needed to identify an optimal outcome. The other point is that the mother has to operate under the constraint that Alice and Bob don't share her view that the optimal outcome should be fair; Alice and Bob simply want as much cake as they can get. In other words, the procedure—the mechanism—has to be compatible with the participants' objectives. It has to be “incentive-compatible.”

Dividing a cake is our warm-up exercise. Let me spend most of the rest of my time on a second example. This is a big problem that has faced many governments around the world over the last 20 years.

Twenty years ago, the U.S. government—and subsequently, other governments—decided that it was inefficient for them to hold on to so much of the radio spectrum themselves. It would be more efficient to transfer the rights to use large bands of radio frequencies to the private sector, to telecom companies. In fact, that privatization of the radio spectrum made possible the telecommunications revolution that we have been living through.



Let's discuss a simple example of privatization. Imagine that you're a government, and you have a particular band of radio frequencies the rights to which (i.e. a license to which) you want to transfer to one of several telecom companies interested in this band. Your goal is to put the license into the hands of the company that values it the most, because that would be the *efficient* allocation. The problem is that you don't know which company that is.

What do you do? You could simply ask each company, “How much do you value the license?”, and give it to the company that quotes the highest number. Of course that's not likely to work very well, because if a company understands that its chance of getting the license is higher if it quotes a higher number, then it's going to have a strong incentive to exaggerate. And, if all the companies are exaggerating, then the government has no idea which company really *does* value it the most. The mechanism is too naïve.

The government could do something more sophisticated, and have each company make a bid for the license. A bid is a statement of how much you're willing to pay. Then the license could be awarded to the company that quotes the highest bid, and the winner would pay its bid. Now, this mechanism will eliminate the incentive to exaggerate; if the license is worth \$10 million to you, you're not going to bid \$12 million, because if you win, you'll have to pay \$12 million, and that's too much. However, now companies have an incentive to *underbid*. If the license is worth \$10 million to a particular telecom company, it's not going to bid \$10 million, because if it *did* bid \$10 million and won, it'd be getting something worth \$10 million, but would be paying \$10 million; its net profit would be zero. So it will bid something less than \$10 million; it will underbid. But if every company is underbidding, then once again, there's no guarantee that the winning company will be the company that really does value it the most. So this second mechanism is a bit better than the first one, but it still won't work.

This bidding process is a bit better than the first one, but it's still flawed. You might ask, "Well, is there any mechanism which gets it exactly right, where companies don't have the incentive to overstate, and they also don't have the incentive to understate?" It turns out that the answer to that question is "yes"; this was discovered about 50 years ago by the economist William Vickrey. It's a very clever, very simple solution, and it turns out that Vickrey's solution has formed the basis of the auctions that the FCC, for example, actually uses. In other words, the solution is not just of theoretical interest, but has been of immense practical value in this country, and, for that matter, in many other countries, too.

What did Vickrey suggest? It's a twist on the bidding mechanism that I just talked about. Once again, every company makes a bid for a license, and once again, the winner is the high bidder. But now, instead of paying its own bid, the winner pays the second-highest bid. If, for example, there are three bidders, and one bids \$10 million, one bids \$8 million and one bids \$5 million, the winner will be the \$10 million bidder, but it will pay only the second-highest bid, \$8 million.

Why does this work? First of all, companies no longer have an incentive to understate, because they don't pay their own bids. If it's worth \$10 million to me, then whether I bid \$10 million or \$9 million, I will pay \$8 million; if that's the second highest bid. Underbidding doesn't get me anything. Furthermore, if I *do* underbid, I run the risk of losing the license altogether. Suppose, for example, I bid \$7 million, I will then lose to someone who bids \$8 million. But if I had bid \$10 million, I would have won, and made a nice \$2 million profit—\$10 million minus \$8 million. By underbidding, I run the risk of foregoing this profit. Underbidding is never a good idea, and it can be a very bad idea if you're thereby outbid by someone else.

You also don't want to overbid. Suppose the license is worth \$10 million to me. Would I want to bid \$12 million? If the second-highest bid comes in under \$10 million, say at \$9 million—it doesn't matter whether I bid \$10 million or \$12 million; I'll win either way, and I'll pay the \$9 million. However, if someone bids *more* than \$10 million—say, \$11 million—and I've bid \$12 million, then I'm in trouble. I will win—that's true—but I'll have to pay \$11 million—and that's too much. So, I don't want to overbid, either.

In fact, you can now see that the optimal strategy for a company is to bid *exactly* what the license is worth to that company. This means that the winner—the highest bidder—will be the company that really does value the license the most. So we've solved the mechanism design problem: how do you allocate the license to the right company without the mechanism designer knowing in advance which company that is. The mechanism, in effect, reveals the right answer through the participants' own actions.

I'd like to make one final comment. Applications of mechanism design are everywhere. Any time there is a goal to be achieved and not enough information to achieve it, that's a situation which is ripe for mechanism design theory. Two big applications for the future: First, how do we create an international treaty limiting greenhouse gas emissions? That is in large part a mechanism design problem.

Second, how should we reform the way we elect members of Congress? I don't have time to talk about those questions now, but I would be happy to elaborate on them in the Q&A, if anyone's interested.

Let me stop there, and thank you for your attention!

JACK FRIEDMAN: Thank you. A Nobel Laureate in Literature, Poet T.S. Eliot, had a wise statement. I may distort the quote slightly, because this is my understanding. He said, in the 1930's, "They constantly try to escape from the darkness outside and within, by dreaming of systems so perfect that no one will need to be good." To me this says that people try to design perfect systems to accomplish their ends so they won't have to worry about human nature, which is an interesting observation.

Could you comment about the link between the rational design of things and trying to take into account the nature of personal behavior?

PROF. ERIC MASKIN: One thing that we know from the work of Daniel Kahneman and other pioneers of behavioral economics is not just that people fail to be fully rational—we already knew that—but that they fail to be rational in very systematic ways. We can often predict how they will deviate from rationality; it's not random. Indeed, we can take into account their deviations when we design our institutions and our mechanisms.



For example, we know that people would like to eat healthy diets, but have a hard time sticking to their resolutions when confronted with a lot of unhealthy food. Now, we're all tempted on the spur of the moment to eat stuff which isn't very good for us. We'll regret it later, but that doesn't stop us from doing it now. How can we give people freedom of choice, not restrict their options, but still ensure there is a reasonable likelihood that they *will* stick to their resolutions? One way of doing this—as a simple example—is to design a cafeteria line so that the healthy foods—the yogurt and salads—are at the *front* of the line. People tend to take the first thing that they see. We're not going to prohibit them from choosing French fries, but those will come at the end of the line, after they've already stocked up on salad.

That's what modern mechanism design does in light of the discoveries from behavioral economics. We're not telling people what to do, but we're taking into account their behavioral propensities when we design the mechanism—in this case, the cafeteria line.

JACK FRIEDMAN: If I understand this correctly from history, it was mentioned a hundred years ago by Alfred Sloan, the founder of General Motors.

PROF. ERIC MASKIN: Right.

JACK FRIEDMAN: He designed the modern internal control and compensation system. His insight was that you pay people according to the output that you want them to have in your company. If you want to have quantity, you give them financial incentives to produce quantity. If you want safety, you measure who has the lowest accident rate. The fall of the Soviet Union and their economic problems came in part from measuring quantity, not quality: “We fulfilled the five-year plan for the unit output of our factory.” I assume, in the real world—whether it’s a capitalist business or a socialist enterprise—the question is, how do you set up incentives for people to produce what you want?



PROF. ERIC MASKIN: That’s right.

JACK FRIEDMAN: That is the use of mechanism design.

PROF. ERIC MASKIN: Exactly. One vital question is, why did China succeed and the Soviet Union fail? They were both planned economies. The Chinese economy started evolving in the direction of a market economy about 35 years ago, but even today there’s still a very large element of government intervention. So why did things work so much better in China, than in the USSR?

JACK FRIEDMAN: At least in the last 35 years.

PROF. ERIC MASKIN: Well, one reason is that they have set up a mechanism that induces competition across provinces. The central government rewards provincial governments according to how well those provinces perform economically. Provincial governors are promoted or fired depending on how well their provinces do.

In the Soviet Union, you didn’t have that kind of competition. You had instead giant ministries. You had, for example, the steel ministry and the gas ministry. There was no way of pitting one ministry against another. It didn’t make sense to compare the steel ministry’s performance vis-à-vis the gas ministry, because they’re not really comparable!

The Chinese economy was organized differently: different provinces *were* comparable, and so it was possible to have them compete against each other. This difference is an important reason why China succeeded and the Soviet Union collapsed.

JACK FRIEDMAN: Thank you.

John Marzulli is our guest from Shearman today, and he’ll introduce his topic now.

JOHN A. MARZULLI, JR.: Thanks very much, Jack. I have been asked by Jack, who seems to believe in interdisciplinary crossover here, to see how I can perhaps create links with the Professor's work and what I do on a day-to-day basis as an M&A lawyer. I'm going to see if I can take a stab at having some success at that.

I will, as an outset, comment on the cafeteria line example. My wife runs a charter school, and they, in fact, designed their cafeteria line just that way to encourage healthy eating in the students. The challenge is that people learn. It worked for two days, and then the kids immediately went to the second half of the line to get the French fries! If there was any room left on their plates, they would go back and get the salad. It's an evolution, no matter what you do!

PROF. ERIC MASKIN: That's right.

JOHN A. MARZULLI, JR.: Starting out, I want to define some terms. I can be academic at least for a moment. A negotiation is a discussion set up or intended to produce a settlement or, in my world, an agreement. An argument is a discussion involving differing points of view in which reasons are put forward in support of and against a proposition, proposal or case, an address or a composition intended to convince or persuade.

These are from Dictionary.com—I didn't bother to go to the OED for any of these. I couldn't resist this [Prerecorded Monty Python dialogue "Argument Clinic"]:

[Knocking on door.]

A: Come in!

B: Is this the right room for an argument?

A: I've told you once!

B: No, you haven't!

A: Yes, I have!

B: When?

A: Just now!

B: No, you didn't!

A: Yes, I did!

B: Didn't! Didn't!

A: I'm telling you I did!

B: You did not!

A: I'm sorry—is this a five-minute argument, or the full half-hour?

B: Oh! Ah! Just the five-minute one!

A: Fine!

[Door slams closed]

A: Thank you! Anyway, I did!

B: You most certainly did not!

A: Right. Let's get one thing very clear. I most definitely told you!

B: You did not!

A: Yes, I did!

B: You did not!

A: Yes, I did!

B: Didn't!
A: Yes, I did!
B: Didn't!
A: Yes, I did!
B: No—this isn't an argument!
A: Yes, it is!
B: No, it isn't—it's just contradiction!
A: No, it isn't!
B: Yes, it is!
A: It is not!
B: It is! You just contradicted me!
A: No, I didn't!
B: Oh, you did!
A: No, no, no, no, no, no, no!
B: You did, just then!
A: No, nonsense!
B: Oh, but this is futile!
A: No, it isn't!
B: I came here for a good argument!
A: No, you didn't! You came here for an argument!
B: Well, an argument's not the same as contradiction!
A: Can be!
B: No, it can't! An argument is a collected series of statements to establish a definite proposition!
A: No!
[End of prerecorded dialogue]



JOHN A. MARZULLI, JR.: Now, I strongly recommend that you watch the rest of that clip someday, because it's one of the funniest things that Monty Python ever did. And as they so eloquently put it, an argument is *not* the same as contradiction, but an intellectual process, a collected series of statements to establish a definite proposition.

We've all been in negotiation sessions where people just said "no". There's a refusal to negotiate, and that obviously can be an appropriate strategy to adopt in any particular negotiation, but from my perspective, it's not really a negotiation.

Before getting involved in any negotiation, the key is to be prepared. It's no different than anything else in life. "Be prepared" is the Boy Scout motto. I was an Eagle Scout. My very first camp-out, when I was eleven, I brought my bag of Hamburger Helper,

without having bothered to discover that it didn't include the hamburger. I went hungry that weekend! Nobody helped me out, but I ate well for the rest of my Boy Scout career.

You learn to be prepared. First and foremost, establish your goals. I didn't realize that I was practicing mechanism design for most of my career, but the overlap between what the Professor has been saying and what I'm saying is remarkable.

Play twenty questions. I sit down with my clients all the time and say, "What are your goals? What do you want to accomplish? Is IT important? Is price important?" (Price is always important.) "*How* important is price? Is it a strategic acquisition? Is it a defensive transaction?" The list of possible questions goes on and on—and it evolves throughout a transaction. The questions that you ask on day one will be replaced by a whole series of new questions on day ten.

Prioritize your goals. Once you get the answers to the questions, you need to find out what's really important and what's not. Prepare for trade-offs. You aren't *ever* going to get everything you want in a negotiation, so try to anticipate in advance where the tradeoffs are likely to be.

Try to anticipate the counterparty's goals and priorities, and *its* likely trading positions. Again, this plays right into what Prof. Maskin was just saying about the mechanism being designed to deal with the fact that you don't have information. You do the best you can to gain insight into your counterparty—who they are, what their goals are—but you're never going to have perfect information. It's just not that kind of world. Evaluate their likely positions; separate the people from the problems. Personalities can be very important in any negotiation—even though they *may* be irrelevant, but they're not necessarily irrelevant to the process. As I said, it's not an efficient market; neither side has perfect information. To the extent you can establish an informational advantage over your counterparty, you're clearly going to be advantaged as a result of it.

The Professor had the luxury of providing relatively simple examples with relatively few participants. We deal with a multi-constituency problem all the time. I don't just mean that there are multiple parties. Company A negotiating with Company B. Company A is represented by shareholders, directors, officers, employees, creditors, joint venture contract counterparties. There are all sorts of people who have a seat at the table—you have to identify who they are, figure out what *their* point of view is, and see how you might anticipate *their* participation in the transaction. You need to know which groups really have a say in the outcome.

In addition, you need to identify and deal with conflicts of interest. I'm not going to say that they're necessarily bad things, but they exist, and they need to be dealt with. Sometimes they're as simple as a senior executive suite that thinks they're going to lose their jobs as a result of a transaction, and that obviously affects the way they react to it. If you think you're going to be the CEO of the combined company that also affects the way you react to the transaction.

These things are facts of life. You figure out what they are; you try to figure out what to do about them, how to take them into account when you engage in your negotiation. From my perspective, it's also an issue identifying who my client is, and who my client is in any particular

issue that's within the negotiation. I don't mean *legally* who my client is; it's always easy—it's Company A. The question is who speaks for the client? Sometimes it's the CEO; sometimes it's the Tax Director; and sometimes it's the Chairman of the Board. It depends on what issue is at the center of the discussion at any given point in time.

Then you would try to identify what leverage you have. What leverage can you pull in order to try to win the negotiation? The negotiation *is* a contest; people win and people lose. What leverage do you have? Are they incentives, or are they disincentives? You have to identify your carrots and sticks.

One of the advantages, from my perspective, of the M&A world is that we view it largely as a variable sum game. I view litigation as a zero sum game—you win, I lose. At least here, there's a concept that in most transactions, you can build a better mouse trap. Everybody can be ahead as a result of the transaction. Clearly, you want to identify where the opportunities might be, in order to advance the interests of multiple participants in the transaction. Obviously, at the far end of the extreme, you have hostile takeovers where one side, at least, is going to view it as a zero sum game.

The incentives can be intrinsic in the sense of inside the deal—what can I offer you in this part of the contract in order to get you to give me something in this other part of the contract? Sometimes they're extrinsic—it's just outside the four corners of the deal completely. Still, it's a world that needs to be evaluated before engaging in any negotiation.

Big picture politics can be an important issue. In one sense, it's totally extrinsic to the deal, but if you're doing something that is going to raise a political furor someplace, then obviously you can't ignore that fact, and you need to figure out how to deal with it. I mean "politics" in the broadest sense—it could be a union issue; it could be an antitrust issue; it could be all sorts of things.

That's all the lead-in. Once you've got all that stuff, then you're talking to prepare your arguments, and this is where I go back to my favorite Monty Python skit. From my perspective, the counterparty's position always makes sense, at least to himself. A negotiating stance that says, "That doesn't make any sense," is *rarely* going to be successful, because it merely puts the counterparty on the defensive from day one. If you can give the person an example that leads him to conclude that it doesn't make any sense, you're way ahead of the game.

My experience—and I have been doing this for a little over 30 years—is that by and large, people like to appear to be reasonable, and they actually want to be likeable. There are obviously exceptions to any general rule, but more often than not, in a negotiation, you're sitting opposite a table where someone would prefer to be seen as a rational participant in the discussions rather than someone who is not.

Deal precedents are great, so far as they go, but anybody can find a precedent for any position. A negotiating strategy that says "It's always done this way" doesn't carry much weight and isn't going to get you very far.

The flip side of that, however, is a bit more correct. It is extremely hard to maintain a position which is really against the weight of the precedent. In this information age that we all

operate in these days, where there are deal studies and precedent studies at your fingertips all over the place, we all have much better market information about what percentage of deals have a rep and warranty that survives for twelve months vs. eighteen months, or things of that nature. You don't have to be square in the middle, but if you're markedly off the norm, you're going to have a difficult time defending your position.

If you can demonstrate why your position is actually in the best interests of your opponent, you're way ahead of the game. Again, I keep coming back to the Monty Python routine—Terry Gilliam's remarks. You need to be able to pull together a series of points that lead you to believe that there's a common interest that you both have and that if the person adopts your approach to life, his interests will be advanced.

Then next to the last step, before actually walking into the conference room—and all of this is what you do *before* you actually engage in the negotiation—is determine your approach. This is a question that Jack asked me earlier. There are two basic approaches: a competitive or confrontational approach, or a cooperative one. There is room for both. My own experience is that in the long run, the cooperative approach is much more likely to get you where you want to go, especially in the admittedly variable sum game situations. There are circumstances where just saying “no” and saying “because that's the way I want to do it” are perfectly appropriate. More often, that's when *you* are representing the person who has all of the leverage, all of the negotiating power, and your counterparty is really in a position where it's a “take it or leave it” situation for them. It's not that common, but it certainly happens.



You're determining your opening positions, your fallback positions, your bottom line, and in its own way, it's a military campaign. You're forward planning. You have to assume you're not going to achieve all of your objectives. How do you recalculate, recalibrate your objectives as the negotiation goes on?

At some point in time, you're going to send out a draft of a document. You're going to get back an issues list; you're going to get back a responsive drafted agreement. That's the first time you're actually going to find out how good a job you did up until now. Are they coming back with issues that you've anticipated? Have they come back with positions that you anticipated? Are they raising things that are just coming out of left field that you had no idea were going to be topics for them? That's the point when the actual back-and-forth of negotiation starts in earnest. You may very well be sitting down again and starting all over again and, as I said, recalibrating.

One of the things that I would do to prepare is sit down, prepare lists, make charts, do scripts—all those things—to help focus the mind and anticipate. At the end of the day in

negotiation—we deal with really intelligent people—you don't get to be the CEO or the CFO unless you're smart and quick on your feet. Everybody's good at walking into the room and winging it and walking away believing that he or she is a winner. If you can force people to sit down and actually prepare more than they otherwise would like to, they'll be bigger winners. This is all part and parcel of the negotiating process.

Obviously, when you join in the actual bargaining, positions are laid out. You have to figure out, "This is the issues list; I'll offer you these three, you give me these two." It's much easier to trade related points. It is one thing for me to negotiate a package of deal protections in a public deal and say, "If you give me a termination right, I'll give you a breakup fee that's a little bit bigger." It's much harder to say, "You increase the purchase price, and I'll do something that's totally unrelated to price."

When you're pulling together your trading positions, obviously you try to group them in the best way you can.

All of that is by way of background. At that point, I thought I'd try to pick a couple of areas to just drill down, to be a little bit more specific. The first section, actually, I'm going to skip, because it's less related to what Prof. Maskin was talking about. An M&A transaction is all about risk allocation.

We may not be allocating a social good; we're allocating fear of the harm. It's a little bit on the other side. When you talk about risk allocation, there are basically two types of risk that we allocate. One is closing risks—when do you have to close; when don't you have to close. If something happens between signing and closing, can I either get out of the deal or renegotiate the deal? Then there are all the valuation risks covered by reps, warranties, indemnities, etc.

I want to jump ahead to auctions. We've heard a great deal about auctions, and I'm delighted to be able to put myself in the "brilliant minds think alike" category with Prof. Maskin. As I said, I didn't realize I was practicing mechanism design for most of my career! Obviously, auctions of corporate control are used in both public and private transactions. They're designed by the auctioneer. Typically, that's an investment bank which is hired to go out and sell a business for the best price possible, on the best terms possible. It could be open and notorious. When you see a company put out a press release saying it is "exploring strategic alternatives" that means, "we're probably for sale; if anybody has an offer to make, let us know."

On the other hand, it could be closed and private, meaning nobody wants anybody to know about it. Which you choose really depends upon how much damage you think your business is going to suffer by being exposed to a public auction. More importantly, the damage if exposed to a public auction that might actually fail. If you go out and say "we're for sale" and then nobody buys you, there's this damaged property concern. What do you do next?

Obviously, an efficient auction requires a critical mass of bidders. The beauty of a really good auctioneer is that he can convince the only bidder there that there are other bidders—recognizing that there are limits on behavior based on common-law principles of fraud. You can't actually lie about whether or not there's another bidder, or what price was offered.

In order to encourage multiple bidders being in the process in today's world, you want to place some strategic buyers in there. Typically, these are people who, in theory, could pay higher prices because they have synergies that they can realize by combining existing businesses. They also have factors that may constrain their ability to bid up. If you're an investment-grade company and you want to maintain your investment grade, maybe you can't borrow quite as much money. You may be concerned about dilution; you may have antitrust risks. The flip side of having a deep pocket is that you probably have a competing business, and you have to deal with the antitrust side of things.

The beauty of financial buyers is there are so many of them that it's relatively easy to generate a robust auction these days, by including a critical mass of financial buyers. If you tend to believe that all financial buyers use the same model, and therefore, they'll all bid the same price, that's not, in fact, the case, in my experience. We recently participated in an auction where we had seventeen bidders—three strategic bidders, fourteen financial buyers—and the bids from the, the low bid from the financial buyer was 50% of the bid from the high buyer. They're obviously using different return analyses in order to come up with those bids.

These days, we also have a hybrid, which is a strategic buyer that's a portfolio buyer of a private equity firm, and they have a little bit of both in the mix.

Again, the goal, if you want to run a good auction, is to get as many of these people into the process as possible.

Historically, when I started practicing, the guy with the money drafted the document. As a lawyer, I'm more interested in what the document says than the number that follows the dollar sign. When I started out, if you were the buyer—if you had the money, you drafted the document.

With the onset of auctions, that has changed completely. the seller now controls the pen. When the auctioneer designs the process, part of that process is I'm going to do the first draft of the agreement, and I'm going to send it to you. In addition to price, you're going to bid on the basis of that document.

What's the goal? The goal is to force the bidders to bid on similar terms. You want to get the best price on similar terms and not be distracted by having to spend hours analyzing huge differences in words in a contract that may or may not have much meaning.

Your draft could be seller-friendly, buyer-friendly, or it could be so-called "middle of the road." It depends, in part, on what your goal is. How did you come out on those twenty questions that you played with your client before you started the auction process? Each one is appropriate under a different set of circumstances.

You tell the bidders that if you deviate from the form, it'll count against you. It will be a detraction from the value of your bid. The goal is that you want to force the bidders to negotiate with themselves as much as possible. Only make a change if it's, quote, "important." It's much easier to negotiate with somebody who's already done three rounds of negotiations internally than it is to start from the first day.

Again, from a valuation perspective, the receiving contracts that are marked up—start with the state form—it makes it much easier for the auctioneer. Then compare the bids and make relevant adjustments.

For example, it's not always true that the highest price wins. I've actually sat around in rooms where we've debated whether or not we should use a Vickrey auction for these kinds of proceedings. To the best of my knowledge, it's never happened. I don't think anybody's tried it. I can tell you that if I have a bid from a strategic buyer that has an antitrust issue, and I have a bid from a financial buyer who I think is perfectly capable of closing the transaction and doing it quicker, and is bidding 25 cents a share less, I've seen situations where people take the lower bid. It comes with greater certainty, greater speed. There are other advantages which outweigh the difference in price.

What, perhaps, is the most important piece here is that it shortens or eliminates the time lapse between the time you select the winning bidder and the time that you sign a contract. When I go up to Jack and I say, "Jack, you win—let's sit down and finish negotiating the contract." All of the negotiating leverage just went from me over to Jack. I want the amount of things that are left to be negotiated, the time within which that negotiation takes place, to be as short as humanly possible.

The most successful auction I ever participated in—and it was a long time ago—the bidder made no changes to the contract at all—put the number "1 billion" after the dollar sign, and submitted the bid. They won. The contract was signed five minutes later!

A corollary to this is, for those of you who are familiar with M&A contracts, they always comes with disclosure schedules. There's a rep, "there's no environmental problems except as disclosed on the schedule." Having somebody bid without the schedule is like giving them *carte blanche* to renegotiate the entire deal after they've submitted their bid, because they can always say, "I didn't expect to see *that* on the disclosure schedule." If you're going to *really* run an auction, you want to make sure that the bidder has *the complete package* at the time the bidder is asked to put in their final bid. If you want it to be final, you'd like to be able to sign ten minutes later, if at all possible.

I've certainly been involved in situations where you pick three semifinalists; one of them will be in this room, one of them will be in the conference room down the hall, and the other one will be in the conference room across the way. You negotiate with all three of them. You don't really annoy the bidder; you say, "We're *almost* ready." Again, the point is, you don't really want to be in that position where the negotiating leverage has really shifted over to the buyer.

Just as an aside, you may have all read about staple financing. It's another way of eliminating variability between bids. If you can provide a financing package which is attractive, then that takes out of the equation, to mark comparable bids, any concern about one guy's ability to get financing on more attractive terms than somebody else. To the extent attractive terms are available, you make them available, and all the benefit flows in the form of better purchase price.

The seller gets to set the bidding rules. Typically, it's a silent or a closed bid. You decide whether you want to prevent or facilitate joint bids. If you have two guys that really

aren't strong enough to bid at a decent price, you let them partner up and bid together. If you don't think you have enough bidders, then you prevent it, so people have to bid separately. You can request bids in whole or even in parts. One of the areas where we've seen evolution—if you know anything about tax—sometimes in a stock deal, people do a 338(h)(10) election to step up the basis in the assets. Once upon a time, people approached that by simply saying, “If you want to make an (h)(10) election, it'll cost me \$5 million, so reimburse me the \$5 million, and I'll do it.” No one does it that way anymore. Now they say, “If you want to make that election, tell me how much more you will pay me for it.” The theory is that it costs me five, it saves you ten. I ought to get more than the five, but less than the ten. It sounds like the auction on the wireless spectrum there.

Ultimately, it's an unfair game. It's a manipulatable process. The auctioneer sets the rules and gets to change the rules whenever he wants to. He can tilt the playing field to favor one bid over another; offer incentives, exclusivity, lockups—all sorts of things—to try to encourage people to get to the right place.

To go back to the conflicts of interest piece—one of the most difficult decisions to make is—especially when you have a company selling a subsidiary or a division—when do you allow the bidders to engage with management of the target? At some point, the management realizes they've got two hats. They start out representing their current employer, who's selling them, and they eventually start thinking, “This guy's likely to be my new employer.” At some point, the loyalties shift from over here to over there. Managing that process and making sure that it plays as something that's additive to the process, rather than detrimental to the process, is extraordinarily important.

From a buyer's perspective, your options are really limited. You can play the game; you can participate in the auction; you can refuse to participate (at the risk of losing) by saying, “I'll only negotiate on an exclusive basis. The alternative is to try to preempt the process by throwing a big price on the table and saying, “Now will you talk to me exclusively?” There, obviously, you have the risk of overpaying.

The universe of people who actually refuse to participate in auctions has, in my experience, gone to zero. Twenty years ago, there were a lot of people who would say, “I won't participate in an auction; run your auction, and if you don't like the result, come talk to me; I'll sit down with you.” That universe is now a null set, as far as I'm concerned.

There is an interesting thing about subsequent public disclosure. I'm sure you've all seen public M&A deals where at the end of the day, a proxy statement or something goes out that has the background of the offer section. It's both fascinating and sometimes extraordinarily embarrassing to discover, when you read the background section, that you thought you had participated in a really hot auction. You look at the SEC disclosure and you see that the cover bid was a company bid that was ten bucks a share lower than you are and dropped out of the process three weeks before you put in your final bid. There's actually a huge fear of potential embarrassment that runs through the whole process. Especially in the public arena, because at some point in time, there's going to be public disclosure about how the process actually worked out. Everybody will know how well you anticipated the competitive situation and who else were likely to be buyers and play in the auction.

I also want to spend a couple of minutes on pricing mechanisms. There are lots of circumstances in an M&A situation where people want to transact business; notionally, they want to transact business at fair market value. They're not transacting business today, so they can't actually agree today that fair market value is a billion dollars. They need to put in place a mechanism that will help discover a billion dollars at some future time. The classic, which you now understand far better than I understand, in terms of its genesis and why it works, is that "you cut the cake, I get to choose" approach. This is actually the classic buy-sell provision. If you and I are small businessmen and we have a joint business together, and we contemplate an exit mechanism sometime down the road, the classic buy-sell provision says one of the two partners will set the price, and then the other partner will decide whether to buy or whether to sell. It works great in the circumstances where it's appropriate; two sides who are roughly equal in size and in stature, and they both have the money to be able to buy, and there are no antitrust issues that would prevent one but not the other, and things like that. But it works fine in those situations.

There are numerous circumstances, though, where it doesn't really work. Some of them are where you have unequal parties, and some of them are where you don't actually have either side being a buyer or a seller, but there is a natural buyer. This you most often see in the situation where there are puts and calls, and frequently there, you introduce a neutral third-party valuation expert—read, "investment bank"—to help solve the fair market value question.

Now, I'm going to use as an example a deal from 2000 that I worked on, where General Motors and Fiat formed a strategic alliance that included, among other things, GM taking a 20% interest in the Fiat auto subsidiary of the bigger Fiat group, which also had agricultural equipment and trucks. We're not talking about in a public company, but in a subsidiary. I was on the Fiat side of the transaction, and the Agnelli family was in this position where there was a lot of consolidation going on in the automotive industry—scale—how many cars you put out was increasingly important. They wanted to cover their bets. They didn't actually want to get out of the auto business, but they needed a partner to help bolster their business. If things didn't go well, they wanted to be able to get out. What did they do? They negotiated a put. Even though GM bought a 20% stake in the Fiat auto company, Fiat—the parent company—had the right to *put* the remaining 80% of the company to GM at a fair market value price. This *put* had a life of many years.

When you put together puts, how do you set up a process for determining fair market value? You bring in a neutral arbitrator. The Fiat/GM situation had four arbitrators. This is how complicated—people are so concerned about not being in a position to game the system that they try to build in mechanism after mechanism to control. The investment bank—the expert that comes in—people always start by trying to negotiate an agreed-upon fair market value. Then what happens if you fail to do that? You can be blind or visible; maybe the expert knows that the parties put on the table. The expert will then come up with a price, and then what do you do with the price? You can pick the expert price. If the expert comes in above or below the price set by the parties, you use the price set by the parties. Frequently, the expert is required to use particular valuation methodologies. You've got to use the DCF analysis; you have to do a comparable company analysis. There are a lot of special rules that can be embedded into the process. I had one situation, where the accounts payables of more than 270 days old had to be treated as debt and not working capital. There are all sorts of bells and whistles.

Fast-forward to the classic ways of dealing with the expert. In a baseball arbitration, the expert really doesn't get to pick his own number, but merely picks one of the numbers of the two parties. You go all the way down to the end, where you have multiple experts; you get into Olympic judging, where you throw out the high and you throw out the low, and you average the rest.

The Fiat/GM situation *was* the most complicated one I've ever worked on. We picked four banks. Two of them were pugilists. Fiat had a bank and GM had a bank. There were two other banks that were neutral. Each and every one of them went out and did their own independent valuation. They weren't allowed to talk to the companies about the companies' valuations. They weren't allowed to talk to each other about each other's valuations. At the end of the day, they submitted sealed bids—literally an envelope with the price in it. The contract was agreed, so that was not an issue. They submitted sealed bids.

We started by opening the bids of the two pugilist bankers, the party bankers. If the party bankers' bids were within 15% of each other, we would take the average of the two and wouldn't bother to open the other two bids. If they were outside of 15% of each other, we would open the other two bids; determine which of the bids was the outlier—the furthest away—and throw that one away, and then average the other three, and then that was the fair market value.

These mechanisms are limited only by the creativity of the bankers and lawyers involved, and to some extent, the extent to which you fear the ability of the other side to game the system.

With that, I will stop and turn the floor back over to Jack. Thank you.

JACK FRIEDMAN: Thank you. I would like to recommend that these comments be incorporated into economics courses, to get some reality on the issues involved.

I want to ask the Professor about the series of decision points, and ways you can handle this whole process. You have to be quick on your feet, because you don't know what the other side is going to do. Could you give us an idea of the type of research that's been done on negotiations?

PROF. ERIC MASKIN: I have not researched negotiation myself, but let me mention that one of the great figures in this area, Howard Raiffa, was a teacher of mine. Howard Raiffa, for many years, was a professor at Harvard Business School, and he studied negotiation in great detail.

One of the things that he emphasized, and that John talked about, was the importance of preparation. You never know exactly what is going to happen once you get to the negotiating table, but you can do contingent planning. If this happens, I will do this; if that happens, I will do that. You try to enumerate the possible contingencies in advance. One of the things that Raiffa did was to take you through the steps of how to do contingent planning. He recommended making a decision tree, where the branches of the tree are the different decisions you could take. At the ends of the branches were the payoffs you'd get, depending on your decision, what other people did, and what choices "nature" made (e.g. what the weather turned out to be).

Now, these decision trees can be extremely complicated, with dozens of branches and literally hundreds of possible payoff outcomes. No person could understand such a tree as an entire entity, but Raiffa developed a process for breaking it down into its component parts. You give probabilities to each of the possible outcomes and figure out how to assign payoffs to each one by doing a series of simple thought experiments. What was initially a very complicated problem is broken down into something manageable.

JACK FRIEDMAN: Decades ago, at Harvard Business School, I noticed that if there were many variables to calculate and you split the difference exactly down the middle, nobody *ever* asked you to evaluate it further. If it was exactly down the middle, it was unquestioned.

However, if you went the extra step, and wanted to show that you were trying to get the best answer, people would jump in right away and ask about other possibilities. I don't know if other people on the panel have had this same experience, but there's a lot of human behavior in understanding negotiating.

PROF. ERIC MASKIN: It's a common social norm—to split the difference.

JACK FRIEDMAN: John, we will have a chance to go back to some of your points later. For now, I'd like to introduce Ashvin Chhabra. Ashvin and I have had the privilege of working together on several programs. His firm, Merrill Lynch Wealth Management, and his group have been kind enough to sponsor this series. He is a serious economist who is also practical about investment. He has a skill for bringing these two areas together.

ASHVIN CHHABRA: Thank you very much, Jack, especially for organizing such a terrific event. It also gives me great pleasure to be on the same panel as Eric Maskin. I'm the Chief Investment Officer for Merrill Lynch. Before I rejoined Merrill, I spent six years at the Institute for Advanced Study in Princeton as their Chief Investment Officer. Prof. Maskin was on the Investment Committee, and on the faculty. One day—those who know Eric, know he is an incredibly modest person. When he won the Nobel Prize, it was a lot of fun to be able to walk over to his office, which was about a few hundred feet away and congratulate him the day that happened. I actually learned a lot from our interactions in the investment committee and the talks that he gave at the Institute.

I'll try to keep my talk short, because I know many of you may have questions to pose. To summarize, we're going to talk about how you should invest, and there are really two parts to this. How should you invest for your own portfolio? How would you invest for an endowment or foundation? This is a situation where we are trying to get to the best decision on behalf of the institution we are representing, and we have a fiduciary duty to do our best.

I actually came to Finance in a very different way—just to correct you, Jack—I'm not an economist. The economists won't have me. I'm actually a theoretical physicist by training, but one that entered Finance some time ago.

JACK FRIEDMAN: I'm in even more awe!

ASHVIN CHHABRA: One of the things that always struck me was, how should you think about the markets? In Physics, you look at nature and you try to discern the laws of nature.

One of the beautiful things that happens is even though the phenomena keep changing, you have this great feeling of security that there are laws that don't change, and your mission is to discover those laws. Once you discover those laws, you'll be able to understand the phenomena in the most general setting.

That's not so in the markets. One way of looking at a market is very interesting. It's almost like the auction that Eric talked about. What is happening is the highest bidder is getting to buy the security. Immediately, you might even say that based on the remarks you just heard from Eric, that people may be overpaying. If the highest bidder is always getting what they want, then people will bid too much, because they don't want to lose to the second person. That creates a question of valuation.



The second interesting question is that when there's a sale of a security, there's a buyer and a seller. The buyer is buying the security; the seller is getting rid of it. Unless there are other considerations, such as life cycle considerations, usually there's a disagreement on forward expectations. The buyer thinks he has other choices. He is getting a great security and is willing to invest his money. The seller thinks that there are other choices that are better, and actually wants to get rid of that security. The amazing thing is that they agree on a price. They disagree on forward expectations; they agree on a price. You just don't do this once; you have to do this over and over again, with multiple parties, to get a deep and liquid market.

What that means, in some sense, is the market is both an economic phenomenon, where you're trying to figure out what's the right price, what's the right valuation. It's also a social phenomenon, which is that the buyers and sellers must trust each other. They all have roughly the same amount of information; it's a fair market. They have to come back and do similar transactions over and over again.

This is what Warren Buffett refers to when he says, "In the short run, the market is a voting machine"—a voting mechanism—"but in the long run it is a weighing machine." In the short run, price and the social phenomena dominate; in the long run, the economic valuation should dominate, so you'll get mean reversion. You'll get these bubbles and crashes, and all of human nature manifests itself in market behavior.

Therefore, that raises an interesting question which is, "Are markets stable?" This is particularly important today, because in the 1950's, when Harry Markowitz and others did their pioneering work on diversification, the average family that was doing well had a secure job. If it was in a corporation and they were doing pretty well, they weren't going to lose their job imminently. If you went to a blue chip company and you did well, you had a career for life. It often came with a pension. Of course, we also had Social Security.

The impact of the market and the stability of the stock market on people's lives was not as dramatic as it is today. Today, everything is portable. You have an amount of money and you don't have a pension, then you have a 401(k), and that's going to be your retirement money. It's a really interesting question: is the market stable, and how should you invest if the market is stable vs. if it's not stable?

Now if you take seriously the concept that the market is an economic phenomenon, in the long run, you should get valuations in a certain way and get paid for risk, equities should out-perform bonds which should out-perform cash. If you look at the social phenomena—especially over a period of a human lifetime of fifty to seventy years, or even a hundred years—then you ask yourself, “What's a social phenomenon that you know that is stable over fifty years or a hundred years?” At best, there is maybe marriage. Then you say, “What's the stability of *that* kind of social contract?” You very quickly realize that all social interactions are subject to fears of instability. Some of them actually fracture and break, and some are lost.

This speaks to the fact that if you're investing in the markets, you should expect instabilities for sustained periods of time. Looking at the history of markets, you actually find that that's true. If you look at the last hundred years, I believe the U.S. and Sweden are two great markets that did very well, and have the highest rate of return and stability. Almost any other market you look at, there are periods where it just stops functioning. What happens? War and political instability happen. All the countries in Europe, for example, get affected by war. Asia, of course, has had waves of instability; as has Africa and Latin America.

You begin to realize that markets are not always stable, and any investing strategy that you have for yourself, or for an institution that you represent, must take into account these periods of instability.

Let me go back about ten years ago, pre-2008, and the market was going straight up, and the Internet bubble had happened. I sat down and thought about what could be the mechanism of a portfolio that would recognize three things, and in a very simple way. One is that we accept the notion that markets give us good return, and you can't put all your money in cash and let it sit there. You've got to find a spot in the markets to get return. You still need safety, so when the market doesn't work, you have a safety net.

The third thing—which I think modern portfolio theory, in many ways, has never dealt with—was how, exactly, do people become wealthy in society? How do they actually move up? Do markets give us an opportunity to do that, and if so, do they do that through a diversified portfolio, or do you have to have a different structure of investing in order to have wealth mobility? Wealth mobility is a big, interesting issue today.

To summarize, I said, “There's a fundamental mistake which almost everybody looks at in terms of investing.” It is not about markets. What is investing about? It's not about return. That is the mistake that everybody makes. Today, you go in and say, “I want to invest.” You go to your financial advisor or any firm around the country and you'll get a diversified portfolio with asset allocation that's appropriate to your risk tolerance, if the process works correctly. If the process doesn't work correctly, you'll end up with some random stocks. Most good firms will walk you through a very well-defined questionnaire for asset allocation of portfolios, and

then a market benchmark. You say, is it a 60/40? Many institutions do that—60% equity, 40% bonds—you can add alternative investments; here’s a market benchmark; then you go back and say, “The market did this; your portfolio allocation would have done this; did you do okay in line; which managers are working; which managers are not?”

Not the central question you should be asking!

The central question you should be asking is, “What are my goals, and how do I achieve them, no matter what the market does?” What are people’s goals? They are: “Making sure my family does okay,” “Making sure that I maintain my current lifestyle,” “Making sure that I have enough income for retirement.” You have to prioritize your goals; some of them are essential; some are important; and some are purely aspirational. What you want to do is meet your essential goals with very high probability, no matter what your market does.

What’s an essential goal? One essential goal is to maintain at least 80% of your current lifestyle. It may be that your kids go to college. Now, you wouldn’t want your kids *not* to go to college because the S&P 500 corrected. That would just be a bad strategy. It would be a disconnect between the importance of the goal you’ve set, “The reason I go to work is to make sure that my kids have a better life than I did,” or your aspiration. Then say, “It’s all dependent on what the market is doing.”

What about starting a business? We all know that starting a business is quite a risky venture. There’s a huge failure rate in businesses. If you really want to start a business, and you really have a passion for something, and you don’t do it, then you’re going to have this aspirational regret throughout your life. You’ll say, “I never did it.” By the way, almost everybody who is *really* successful, such as the Forbes 400—at least in the wealth spectrum—are people who took these chances. You need a mechanism to be able to take that risk without jeopardizing your safety.

In fact, you’ll find many business owners barbell. They have everything invested in their business, and then they have some cash and real estate, just in case things go wrong. They’re not in the market at all, which is another mistake, because the market is a very diversified, efficient way of extracting return from the world. As long as you’re diversified, and the world does okay, you will do really well. If the world doesn’t do okay, you don’t, but everybody else is in the same boat. If everyone’s tightening up and you tighten up, it’s not that painful. That correlation is very important. If the world is doing well and you’re doing well, you’ll just spend a little more.

How do you construct from first principles, equate a good design mechanism for what a portfolio should look like that is centered around the goals you want and their prioritization, rather than the markets. I tell people, markets don’t care about you, so why should you care about them? They’re just a source of diversified return; no more, no less. That’s a very important concept.

A few years ago, I wrote a paper—there’s a reference to it in the materials we have outside about endowments and foundations—about needing three portfolios. You need three portfolios, because the market portfolio will give you market return, but over the long term.

Your safety portfolio will give you safety, but only for short periods of time, because it's very expensive. The safety portfolio is like buying insurance, you may have gold, you may have your house, you may have cash, and short-term bonds. What return would you get from the safety portfolio? Zero, at least in real terms. If it keeps up with basic inflation, you are very lucky, because you're buying insurance. Every day, it costs you the market return, but you need it, because if the market crashes, you need to be able to survive with your basic goals. That's why your house belongs in the safety portfolio, not anywhere else. Therefore, you don't buy the biggest house you can; you don't leverage up 5 to 1; you don't have the biggest mortgage you can because it's a great tax benefit. Over your lifetime, you actually pay it off, because you really expect zero return.

You also expect—and what's interesting about setting it up this way is, you can then say, “Wait a minute; if my house is the safety portfolio, and safety assets return zero over long periods of time after inflation (in real terms). What should real estate return over long periods of time? What should my house return?” If I bought an apartment in New York City today, and I held it and I gave it to my children and they gave it to their grandchildren. Then 200 years later, we looked at the world, and New York City was still a great city to live in, what rate of return do you think I would get from my apartment? Inflation, which is zero real return. The theory and the numbers speak for themselves and fall into place, but most people misunderstand that. Of course, during the real estate bubble, they rise 30% a year or 10% a year. Real estate is really a wonderful investment. It's only wonderful if you have human capital and you know how to play the real estate market, leverage yourself, and then it's very dangerous; it moves into the other parts.

You have the safety portfolio (short-term safety) and market portfolio (long-term safety). If you are diversified, it gives you a healthy rate of return, but you're going to have staying power. You can't exit the market when it crashes. There's all this behavioral stuff that comes in.

The last is the aspirational portfolio, which is your stock options, your partnership, or your business. That usually comes with leverage and concentration. When a business owner comes in, and they're being really successful, 80% of their net worth is now their business. What do they do? Do they say, “I'd better diversify and sell half my business to somebody?” No. They go to the bank and they say, “Can I get a loan? I just need more capital.” People who move up the wealth spectrum and build successful businesses do it with leverage and concentration—hopefully non-recourse leverage, if you can get it. That is the absolute opposite of what you are asked to do when you have a diversified portfolio a la Markowitz.

The middle portfolio is about diversification; the right-most portfolio is about leverage and concentration. The fundamental issue is not asset allocation; it's really risk allocation. I was really happy when John mentioned risk allocation in the context of contracts, because *that's* what the fundamental question is: How much in each of these three portfolios, and how does it relate to the goals that you have, which was the previous slide?

That's what investing is. In the middle bucket, you can do your asset allocation of how much in equity, how much in large cap, how much in small cap. It's almost irrelevant compared to the big decisions that you should be making.

When I first did this about ten years ago, there was a fair amount of criticism from the classical modern portfolio theory people, because they said, “This is just suboptimal; you’ve just done something called ‘mental accounting,’ and mental accounting is a big no-no in theory, because clearly you should optimize everything at the same time, and you’ve segregated things into three portfolios, and it’s inefficient.” This is an attempt to bring together behavioral finance with the rational investor. Creating a robust design so that when the market is going up, you ask yourself, “Do I need to rebalance among these three pieces?” If I want to go into a really good venture, “Is it the market, or is it the admirational piece? How do I size it?”

I’m not going to go into all of the details, because there’s a lot of information on it, but that’s the basic idea in a fundamental way. The paper outside is just a variation on this—which is to say that a lot of endowments and foundations lost their way when they tried to imitate Yale and Harvard in the endowment model. The endowment model is really the middle bucket, but done very well. You do private equity; you do hedge funds; you do the liquidity premium; you get a very good diversified portfolio, but it’s still a market portfolio.

The mistake that people who copied Yale and Harvard did was they pretty much built this better portfolio, but got seduced by its returns, and moved their bonds and their safe portions in to the middle bucket. All they had was this super-diversified portfolio, and they justified having less of a safety net because they really had private equity and hedge funds and all this diversification. When 2008 came, these things that appeared uncorrelated were actually perfectly correlated. What did you have? You had 100% equity-like portfolio—which is devastating for an institution that may be dependent on that money.



This is an example where competition—the peer competition of boards looking at their peer institutions, no matter where they were, and saying, “What return did *they* get—can I get something a little higher?” drove everybody to the middle bucket and created a natural bubble. Therefore, having a good design here, which almost says “What’s my goal for the institution? How much of a safety bucket do I need? I acknowledge I’m going to get a zero real return; what’s the sizing of that with respect to never risking the institution, rather than competing against my fellow endowment CIO or the trustees competing against other trustees.” Maybe you do that just in the middle bucket. This risk allocation concept is very powerful.

With that, I will end, and thank you very much for the opportunity.

JACK FRIEDMAN: By way of reminding people, in the beginning of this recession period, Harvard’s endowment went from \$35 billion to \$24 billion in one year. For those

endowments which want to follow the Yale/Harvard model—think twice. Of course, they have recovered a lot since then.

ASHVIN CHHABRA: I want to point out, that I don't necessarily think that Yale and Harvard followed the wrong model; they have the safety net. Somebody reminded me that if Yale or Harvard actually took their tuition five times what it is today, they would still fill every seat worldwide. They have various kinds of safety nets. They have the alumni. The mistake you make is to look at somebody else's models and not at your own goals; it's a misalignment of goals. Yale and Harvard want to have enormous amounts of money, because they want to remain the top institutions a hundred years from now. They are constantly investing great amounts of money in areas that are emerging. Artificial intelligence, biotechnology, biomechanical engineering—anything that is interesting, they want to be participants in that. That's not necessarily the goal of a smaller institution that needs to specialize in one area and create a reputation.

JACK FRIEDMAN: Ashvin, how do you deal with all the salespeople on Wall Street who are coming in? From a portfolio manager's point of view, and using mechanism design and sector analysis to evaluate the game, how do you do risk allocation to create portfolios?

ASHVIN CHHABRA: People don't like calling it a "game," because there is a seriousness to the market with respect to real money and real purpose. Obviously, it's a very tough game in terms of the participants with objectives that compete against each other. There is a lot of work, and the grand debate of finance, as I call it, is active vs. passive management. There are two schools of thought. One says you should just index and you'll do really well. If I take a dartboard and I throw darts, I will get a good result! The *Wall Street Journal* used to run the dartboard contest for many years, and the results were inconclusive.

Then there are active managers, look at Warren Buffett, and you say, "Had I invested in Warren Buffett at the right time, I wouldn't have to be here!"

It's never been resolved. To me, it's pretty clear; you have a portfolio manager; they have a view of the world; they have a certain algorithm or mechanism of valuing what is better than everybody else. They think they have a legal information advantage, which is a better way to analyze the world than the comparative. They are going up against somebody else; it is a zero sum game, so there are some winners and some losers. You have to pick the right manager, and that manager has to have picked the right stocks, and then after transactions and fees, return something.

It's a very tough game. Within that, there are lots of interesting submechanisms that you can worry about. For example, as a manager becomes successful, he or she attracts more and more money. It becomes harder to find more opportunities. The advantage begins to go down. Even something simple as when a decision is made to buy stock in the market, is a signal to the market. "All this research was done, with good judgment—he must be onto something." Now people begin to start asking, "What's the best algorithm to break up a large order into smaller orders and hide the fact that I've made this decision?" If you're a big institutional buyer, you're going to have to buy a lot of stock, and that, itself, will drive up the market.

This is a fascinating area; we could spend a lot of time discussing active management versus passive management. I feel that what I tried to emphasize was these are second to third order effects. The first order is, figure out what your goals are; get to the right risk allocation. Then, in the middle bucket, you can do whatever you like. You can pick who you think are the five best managers in the world, or you can have a very diversified portfolio.

You're only going to get wealthy through the third, the aspirational bucket. That wealth mobility is going to come from taking your human capital and changing it into some monetary evaluation.

JACK FRIEDMAN: You don't have to have a Ph.D. to be an economist. You are an economist, even if you studied Physics.

ASHVIN CHHABRA: Thanks. I recently mentioned to somebody that I used to be a physicist. He said, "What does 'used to be' mean? Once a physicist, always a physicist!" So I'm happy to add "economist" to it, too!

JACK FRIEDMAN: Let's take some questions from the audience.

[AUDIENCE QUESTION:] I guess this is primarily for Prof. Maskin or Mr. Marzulli, unless Mr. Chhabra would like to say anything. Let's assume a steady state that there aren't any midterms coming out. How would you design a mechanism to produce an immigration reform bill, and how would you negotiate one?

JOHN A. MARZULLI, JR.: Talk about an unexpected question! I will let you go first!

JACK FRIEDMAN: I think the issue is that there are so many different points of view, how do you ever get a consensus?

PROF. ERIC MASKIN: Right. The short answer is: I don't know how to design an immigration bill.

[AUDIENCE QUESTION:] How about a mechanism to do so?

PROF. ERIC MASKIN: Okay. That gets back to something that I touched on at the end of my remarks which was elections. One reason it is so hard to get immigration reform is that there is a flaw in our current election method for electing senators and representatives, and this leads to politicians who are quite polarized. The system doesn't give politicians much incentive to be in the middle, and that's because we use what's called "plurality rule" to elect candidates. If there are three candidates running—as there often are—we elect the candidate who gets the most votes, even if that's short of a majority. That means that there is a premium on being distinctive, either on the right or on the left. I think we would get much more centrist outcomes if we went over to what I call "true majority rule," which allows voters to rank candidates (rather than just voting for a single candidate), and then elect the candidate who, according to the rankings, would beat each of the others by a majority. That would be a true majority winner, and that would likely be a more centrist figure than the people we are currently electing. Once we have people in the middle, compromise over immigration and other contentious issues would be much easier.

JACK FRIEDMAN: A system in which if your first choice doesn't win, you start adding the second choice and then, if necessary, the third choice, until somebody eventually has over 50%.

PROF. ERIC MASKIN: Right. I don't know if my first choice is going to win, so I say if A doesn't win, then I want B; if B doesn't win, I want C. The winner of the election is the one who, according to those rankings, gets a majority over each other candidate.

JOHN A. MARZULLI, JR.: Unfortunately, that, too, is a system that can be gamed. That was the election system for my son's student council in high school, and they developed a system of block voting where people who supported one guy but believed that number two was the next closest threat, they would all put him last.

PROF. ERIC MASKIN: With true majority rule, such gaming will not work. I believe you're talking about a system where a candidate gets assigned points—three points if a voter ranks him in first place, two points if he's ranked second, one point if he ranked third. And the winner is the candidate with the most points. That system *can* be gamed. True majority rule cannot be. Suppose I like A best, B is my second choice, but I'm worried that B might beat A. There's no incentive for me to rank B at the bottom, because in the comparison between A and B, it's only the fact that I'm ranking A above B that matters. Ranking B at the bottom is not going to give A any greater advantage.

JACK FRIEDMAN: In the literature, it said that patents and intellectual property may not stir innovation; it may damage innovation. I don't want to finish without having you comment on that.

PROF. ERIC MASKIN: The whole purpose of having patents and other forms of intellectual property protection is to encourage innovation. If you award someone a patent, you're giving them a monopoly. We know that, in general, monopolies are bad. We only want to allow them if we have a compensating social benefit in return. The idea of a patent is to give someone a monopoly, at least for a limited period of time, so they can recoup their innovation costs. If you don't give them some protection, other people can imitate whatever they've invented. That diminishes the return they get from the innovation, and therefore may interfere with their willingness to undertake the innovative activity in the first place.

This logic works pretty well for solitary inventions but doesn't apply so well to industries where most innovation consists of making many small improvements over time. Take software, for instance, which is an industry that I've studied in detail. There, innovators typically don't take big steps forward. Rather, innovation consists of making a series of small improvements: perhaps, I make a small improvement over what you've done; then someone refines my improvement, etc. In a world of incremental improvement, where each step is building on what has come before, patents may actually be *counterproductive*. If I have a patent on the most recent step, and you want to improve on that, you're going to have to pay me a royalty, and that may deter you from making that improvement. That's bad for you, and it's also bad for society, which is then deprived of that improvement. It's important, when designing a patent system, to distinguish between innovation which is isolated and that which is incremental. Patents work quite well in the first case; not so well in the second.

Looking back, you can make a good case that we would have been better off in the U.S. had software not been protected by patent, but rather just by copyright.

JACK FRIEDMAN: Let us finish with something reported to be true. Janet Yellen, is married to George Akerlof, who won the Nobel Prize for Economics. Talk about an intellectual power couple in Economics. They decided they would make a little experiment. The design mechanism was to figure out a strategy to get the best out of your babysitter. They would find out what the babysitter wanted. For example, “I’d be happy to be your babysitter if you pay me



this amount per hour.” They would voluntarily pay more than the babysitter asked for, on the assumption that the babysitter would do the best possible job for their child if the babysitter was very happy.

ASHVIN CHHABRA: My wife and I followed the same strategy with our kids. That’s exactly what we did. Glad to be in such good company!

JACK FRIEDMAN: One aspect of economics is that you can learn from your children. I would like to thank our speakers today, and especially Prof. Maskin for an enlightening program. Thank you very much.