Todd Zenger, STRAT 6070, 8.1 - The Make or Buy Decision

Our lecture today focuses on the make or buy decision. Every firm faces an important set of choices around which activities and assets that they need access to, need to be housed, organized within the confines of the legal structure of the firm and which they are better off sourcing in some way outside the boundaries of the firm. This ends up being a very difficult decision. As we'll talk about through this lecture, one's intuition about what should be bought and what should be made is often not particularly good. We want to talk about that intuition as well as talk about some basic logic that managers should use in making these decisions about what's inside and outside the firm. Back to our central concept of Theory of Value, one of the critical things that that theory of value should reveal is what are those activities that need to be composed either within the firm or outside the firm, activities that need to be accessed in some way in order to compose the value that you seek to create. After you've determined that then you make a decision about which of these should be inside, which should be outside. Here it's the red activities you decide look, these are things we need to make the blue activities. We can divide. This then gets divided up and we call this the firm confined by the boundaries here of those activities that we choose to access inside the firm. Then you have a separate set of decisions to make about how you're going to access these activities that you're going to source externally through a variety of contractual arrangements or perhaps partnerships, or perhaps some online market. There are a variety of ways in which one can outsource and access those activities outside the firm. There are strong voices that would push firms to do one or the other. You have or will hear these voices, some strongly pushing toward, "Look, outsourcing is wonderful and remarkable." There are all kinds of advantages associated with outsourcing and would push you toward outsourcing more activities. There is also strong logic about why one should integrate. We want to try to sort through which of those voices makes sense under what particular circumstances. As I indicated in the intro, I think we have really bad intuition about when to make and when to buy. In particular there is a tendency on our part to think that what we want is control, and control suggests integration. One has to be very careful in thinking about what kind of control one actually needs access to and therefore what activities should really be integrated. To highlight through the parallels of excessive integration, let me tell you the story of The Saturday Evening Post. Some of you will recognize this magazine. It was really the dominant magazine in the United States for a period of decades before and after World War II. Each issue of The Saturday Evening Post had a painting, an image from Norman Rockwell on it. At its peak, something like 30 to 40 percent of all magazine advertising in the United States appeared in this magazine, an indication of how successful it was. During World War II, the owner of The Saturday Evening Post, a company called Curtis Publishing and its CEO watched all shortages that played out across the economy. This CEO determined that this would never happen to The Saturday Evening Post and really developed this philosophy that what would be value-creating is if the firm really owned its value chain. Here was a company that was in the magazine publishing space here, this activity, and they said," Look, we are going to forward integrate into distribution so we'll be able to market and distribute our own magazines." Moving forward at the same time, they backward integrated building at the time the countries or the world's biggest publishing or printing facility using state of the art technology at that particular time. Of course if you're going to run a printing operation, the critical inputs you need is access to paper, and so the company decided to backward integrate into paper. Of course, if you're going to have a paper operation, the key input that you need is the raw material logs that feed into the pulp paper mill, and so they expanded back into a logging operation. Of course if you're going to have a logging operation, what you need is forests that you're going to be able to cut down to generate and harvests the logs, and so they backward integrated into owning forest lands. They essentially moved completely back and they moved completely forward owning their entire value chain. This proved to be a bit successful because on this land they found some hopper that ended up creating a fair bit of cash for a short period of time. For the most part this was a disastrous move on the part of the company saddling them with assets that they weren't particularly adapted at managing. Moreover, cutting each of these activities off from the discipline that the market provides. The result was this company does not succeed. There's really no indication to The Saturday Evening Post ever existed. On the other hand, firms can make the wrong decisions in the other direction. Many of you are familiar with the story of the IBM PC. When the IBM PC is introduced, they pursue an open architecture strategy. They recognize all these critical activities and assets that need to be composed if you're going to introduce a successful personal computer. At the time, there were lots of different competing formats and they were trying to establish their platform as the dominant one. They knew they needed an operating software, they needed a microprocessor, they needed software that would run on that operating software, they needed peripheral devices like printers that would connect to this system. They adopted an open architecture basically inviting lots and lots of different software providers. Then beyond that they contracted for all of these critical activities most notably contracting with a little company called Microsoft to produce this MS-DOS operating system and Intel for their microchip. All of this initially proves very successful. They compose this set of activities, introduce this very successful product that quickly becomes a standard in the industry. But of course, the story is you fast-forward not too long. Then beyond that, very quickly, all the value is being captured by Microsoft and Intel, these decisions to outsource those activities as opposed to own them. The story goes that the operating software could've been purchased for $70,000 at the outset decision they chose not to make. Similarly for a while, they owned about ten percent of Intel. Presumably, we're contemplating further levels of connection or integration and chose not to do that. As a consequence, that value all flowed to these outside entities as opposed to being captured by IBM. The takeaway from those two stories is there is no simple answer here that vertical integration is not always the right move. Outsourcing is not always the right move, and so what we really want is some deeper, better intuition about when it's appropriate to vertically integrate and when it's better to outsource. I'd say one more thing about this intuition is that you should be aware of simplistic logic. I would characterize simplistic logic here as something like you should outsource what you do poorly and integrate what you do well. If it's an activity you are already particularly good at, you should do it, own it. If you're bad at it, you should definitely outsource. It's not that simple because there's many situations where an activity that you currently do poorly, think of the IBM PC story. The reason they outsourced those activities, you could argue, is because they didn't possess the critical capabilities to compose them. But that doesn't mean that what they shouldn't have done is gone out and bought those capabilities. Similarly, although the two stories I've told to this point don't highlight this, but there may be circumstances under which you actually develop a remarkable capability. I suppose we did talk about it a little bit with the Saturday Evening Post. They build this state-of-the-art printing operation. Initially, it's probably the most capable facility in the world. However, being only beholden, only shaped by demand that the Saturday Evening Post develops for it, over time it just becomes less capable, less up to date. It is not pressured by the market to stay current in those capabilities. In thinking about this question of vertical integration, there are two places to start, and we've previewed this already. One central question is again highlighting what's the composition of assets and activities that we're trying to compose here. What do you need to orchestrate in order to create this value that's coming from your theory of value? Then this is where we're really focused in this lecture. What's the lowest cost approach? Is it using the market? Is it using integration to organize access to these activities and assets? In particular, what's the right type of incentives that you need to create to be sure that you get the access to these activities and assets that are required? At some level, it's really about how are you going to organize access to this set of individuals and assets that you require, recognizing that most of these currently don't reside as you're building this inside your firm already. It's a question of how do you access this abundance of actors and assets to which you need to access? Importantly, it's not just about control. There's a tendency to say, "Look, what I need is control over this resource. I need control over this asset." The challenge here is that you're going to always argue that you need control. The real question is what type of control do you need? Markets, contracting provides a very powerful form of control. Famous economist commented that markets induce individuals to do desirable things without having anyone tell them what to do. That's the best form of control. To have actors outside the firm falling all over themselves trying to address your problems, meet your needs. That's what a market can do remarkably well. As soon as you pull that activity inside the firm, suddenly those very powerful forces that cause these actors to do desirable things without you telling them what to do, now suddenly you have to tell them what to do. You have to direct their efforts. That form of control I always indicate is sometimes needful and valuable if you could avoid it. The beauty of the market is that people are doing exactly what you need and you're not having to provide that expensive, costly form of oversight and control. As I indicated, theories reveal this desired future state of activities and assets. The team that developed the IBM PC, they had a vision of that which they wanted to compose and introduce into the market. It was just a question of how they were going to organize that. If it's Southwest Airlines, again, you have a sense of the types of activities and assets and the configuration that you want to compose. If it's Disney, you again have a sense of what you want to compose. Then the question becomes inside the firm or outside the firm. The virtues of using the market that is keeping things outside the firm, as we indicated, is that you motivate a host of actors often with an abundance of skills and talents to generate the products and services that enhance the value of what you do or want to do. There's a very famous quote from Bill Joy, who was one of the co-founders of Sun Microsystems, who said, "Most of the smartest people don't work for you." Of course, this may cause a CEO to push back and say, "Well, of course, we have the very best people in our organization. We've hired them and trained them and they're wonderful." That is true. You may have wonderful people, but the fact of the matter is there is an army that is far, far larger outside the firm. In that army exist people with very deep knowledge of exactly the problems that you might need solved with the resources to provide the inputs that you need, the services that you need that you are unlikely to be able to match inside the firm. The decision to outsource, in some sense, reflects confidence in the wisdom and creativity of these actors that exist in the market if you couple that capacity with strong motivation provided by the incentives in the market that they're going to compose solutions that are superior in cost and quality to those that you can compose. This is the virtue of the market. If the market has all of these tremendous virtues, why wouldn't we manage everything through the market? Well, there is a set of circumstances under which markets tend to fail. They tend to be less effective in managing a certain set of transactions. I'm going to use this term transaction, and you should think about this as the firm trying to transact or exchange or gain access to a particular asset or activity. This is IBM trying to gain access to an operating system or to a printer, or a set of assets that will support and create value for one's product, or this is Ford Motor trying to make a decision about which parts and components in its vehicles should be internally produced and which can be outsourced. What causes these transactions, these efforts to gain access to these assets and activities and inputs to fail? Well, one is when the desired exchanges, this transaction requires a level of co-specialized investment. We'll talk about what that means. But just very simply, at this point, it means it requires the outside activity or the currently outside activity to make investments that are specific to us, the firm that's trying to orchestrate this value. The more co-specialized that investment is, the bigger the problem. We're going to talk about this. Though it's primarily investment on the part of the supplier, it also could be our own investment. That is we are going to need to make an investment that's specific to that particular activity. Either way, its co-specialization, it's investment specific to this transaction or exchange. Secondly, when exchanges require complex coordination, I need to orchestrate a bunch of activities in a particular configuration. The nature of that coordination is extraordinarily complex, I need things in a particular place at a particular time. Orchestrating that coordination is when it's costly and difficult, it's difficult to manage through the market. Finally, when exchanges require the transfer of subtle tacit forms of knowledge, and we'll talk about this. The presence of any one of these and certainly multiple of these dimensions elevate the difficulty of managing a transaction through the market, and therefore pushes firms to move from market exchanges to vertical integration. Let me talk about each of these dimensions that elevate transaction difficulty. I'm going to spend the bulk of the time talking about this concept of co-specialization because I think it's the chief driver of transaction difficulty that would push this firm to need to contemplate integration. The need for co-specialized investments, particularly when there is some uncertainty about how the world related to your business is going to unfold, elevates the cost of using the market. I think it's this primary driver toward greater vertical integration. Let me describe the dilemma that arises, and that is that in the presence of these co-specialized investments, firms become subject to a problem called hold-up. Let me give you an example of a classic hold-up problem that played out in the 1800s. Then we'll translate this application to a business setting that's more familiar to us. So this story relates to one of the robber barons. These are individuals that owned large industrial empires in the 1800s. One of the robber barons owned the Southern Pacific Railroad. This is a story about the Southern Pacific Railroad. The Southern Pacific Railroad announced that they were going to lay a set of tracks down the middle of California's Central Valley. Incredibly valuable land for agriculture, ranching, etc. They were hoping that by laying these tracks down the middle of the valley, that people would start settling in that valley and the value of the railroad would go up because settlers would round either side, agriculture would be needed to be moved up and down these tracks. They put out a prospectus that invited these settlers to start settling on either side of these railroad tracks that weren't yet there but would be. The perspective said, "Look, we're going to sell you this land once the tracks are laid at a price that's $2.50 an acre and up", was the language. So the settlers came in. They built their infrastructure, their fences and their barns and wells, and started developing the land. Then the railroad tracks came in and it became time to pay for their land. After all this was built, the Southern Pacific Railroad announced that it was going to be up, above $2.50 an acre, at $35 an acre. This is classic hold-up. Once these assets were in place, the cost of moving them was extraordinary. These assets that they had invested in, these farmers were very specific to that land, very specific to that set of railroad tracks and therefore, Southern Railroad was in a position to hold up the settlers and request $35 an acre, because their next best option was to burn their barns, try to move them, neither of which were course really realistic or feasible. There's actually led to major conflict, a gunfight between the settlers and the railroad men that resulted in death on both sides, a major incident that played out in California. But this is a classic hold-up problem. This same kind of economic tension exists in many, many settings as companies try to build up this value that they envision in their theories of value. This problem of hold-up is pervasive throughout the economy. It's pervasive as firms try to compose these activities and assets that are required to execute and build out their theories. Let me give you a quick illustration. This is also a little bit older, but I think it highlights well the issues involved. GM, as it moves more and more heavily into auto manufacturing and starts to introduce automobiles that have actual auto bodies around them, the company that is most known for that capability is a company called Fisher at the time. GM wants Fisher to make some very specific investments. Specific investments that are specific to their particular automobiles and their efforts to build an efficient assembly operation to produce those. GM in particular wants Fisher Body to make large investments in metal stamping of their particular auto body designs. They also want Fisher to locate its facilities directly adjacent to the GM assembly operations in order to cut down on transportation costs and lower the overall costs. Fisher though, has no incentives to invest in this kind of specific capital unless they have some guarantee of price and volumes. The one of the concerns is if we invest in this very specific metal stamping operation and you give us your estimated numbers, price times volume, and you say, "Okay, the math works." It makes sense for us to make these investments. But the problem is, of course, that Fisher knows that GM has no idea what that demand is going to be. Moreover, once they have made that investment, even though GM had agreed to a particular price for that auto body, they can renege on that. Fisher then is over a barrel because their next best use for these highly specific stamp dyes to produce those auto bodies is trivial. Ford doesn't want them, no one else wants them. So it's an investment that's highly specific. GM, of course, are willing to guarantee price and volume because they've got uncertainty about demand. In the end, GM simply buys Fisher, and in doing so reshapes incentives. Now they can simply direct Fisher to make these investments and Fisher in substance gets protection because now it's all owned by the same entity. This, as I said, is pervasive. It exists in any situation where in this case, there's a manufacturing firm that's manufacturing parts, say for a consumer electronics firm and the consumer electronics firm wants this manufacturing firm to make a very specific investment and the estimate is that half of that investment is specific to this particular buyer of their manufactured inputs, that a $100 million become susceptible to hold-up and is a measure of how much the consumer electronics company could renegotiate and bargain down before the manufacturing firm would simply walk away. This presence of specific assets just creates enormous tension and difficulty in crafting an effective market exchange to support this transaction. There are a variety of different forms of co-specialization. It could be that I need a vendor to create and install highly customized equipment. Those are the kinds of examples we step through. It could be site specificity. We saw this as well in the Fisher and GM illustration. I need a vendor to invest in assets at a particular location and once they are invested at that location, their alternative use becomes dramatically compromised. That's site specificity. It could be human capital specificity. I need an outside vendor or what is now an outside vendor to develop deep knowledge about my organization and to customize their skills and that this knowledge and these skills have little application elsewhere. The more unique they are to what I do, the more difficult it is going to be to support that transaction through the marketplace. Finally, it could be a temporal specificity. It isn't that the asset itself is all that unique and specific, but I need it at a location at a particular time. If it's not there on time, my other assets and investments are dramatically compromised by that inability to match my temporal need. Think of this as a ship that if it's not at the port at a particular time to receive the goods that I need to have sent somewhere else, it's costing me as extraordinarily amounts of money in just inventory holding cost as well as I'm compromising delivery on a product at the other end, for which if I don't deliver on time, there's some dramatic penalty for me for failure to deliver. That's a temporal specificity. All of these are forms of co-specialization that make it more difficult to support exchanges through the marketplace. All that discussion was about co-specialization. What I argue is the primary driver of transaction difficulty two others and I will just very briefly discuss those. One is complex coordination, that's really fueled by a difficulty in measuring exactly what you need. It's this complex coordination that you're trying to orchestrate and it's really difficult to precisely indicate exactly the output or the effort that you require from each of those activities. So it may be that it's difficult to measure quality or it may be difficult to measure quantity or reliability, or exactly how you want this activity to coordinate with other activities being performed. The more difficult that it is for you to write a contract that will support that exchange will orchestrate this coordination, the less likely you will be to be able to outsource that to activity. Therefore, the more likely you are to need to integrate it. The third factor that increases the difficulty of transacting is contracting for knowledge. If what you're trying to access is technology, it's skills, it's expertise is more difficult. It's not that it's impossible, but it's more difficult to write a contract to protect that exchange. At a very basic level, you can think about it in this simple way. Imagine I come to you or you come to me and say, look, I have some knowledge that I think is really valuable for your firm or perhaps identified I think you have knowledge that's particularly valuable to the firm, and I say, listen, I'm not exactly sure how much it's worth. But why don't you tell me what you know, then once you do, I will tell you how much I will pay for it. Of course, the problem is immediately evident. As soon as you've told me what you know, I have no reason to pay for it. The knowledge has already been transferred. Knowledge has this weird attribute where contracting is more difficult. It's also the case that some kinds of knowledge is deeply embedded in organizations or deeply embedded in people's heads. It's hard to write down and articulate. In that case, that too may be something that's very difficult to contractually access. Instead, one may need to integrate that knowledge or make employees of those that possess that knowledge in order to gain access to it. So to summarize, co-specialization, measurement difficulty or complex coordination as well as the need for knowledge transfer are all attributes of an exchange that elevate transaction difficulty and push organizations to be more likely to need to access them through vertical integration as opposed to through market exchange. To just understand this a little bit more deeply, we might ask, okay, so what are the advantages that one gains from choosing to integrate? Well, in choosing to integrate, one of the things you access is this ability to just wield authority. That is to say, listen, you who run this activity, you are going to make these particular co-specialized investments. In addition, there's this greater opportunity to flexibly coordinate it. I can't write a contract to tell you everything that you need to do. But once you're my employees, I can more nimbly, flexibly, overtime, articulate the nature of the coordination in a way that I could never be able to write down in a contract a priori, that is in advance. Similarly, by integrating, you may be able to build a culture, a cooperative community that's imbued with some sense of shared purpose and a sense of fairness that inspires individuals within that organization to cooperate to make these co-specialized investments, to share knowledge, and to coordinate in a way that may be very difficult to compose through contracts. So then the question becomes, why don't I just integrate everything? Because in integrating I gain access to these advantages that I just articulated. This opportunity to directly wield authority, this capacity to build this culture, don't I always want that? Wouldn't that enhance everything? Why did the Saturday evening post fail in its efforts to do exactly that, bring it all inside. So one thing you might ask is, well, if there are these advantages associated with integration that they can overcome these transaction difficulties, why don't we just integrate everything? The answer to that is that the cost of integrations elevated control is really the loss of the markets motivation. Now you might push back on that and say, well, why can't firms gain these additional levers that they have access to, but at the same time create the incentives that the market can provide. I need to address that with you. What is it that makes it impossible or difficult for firms to replicate the incentives that the market possesses. I'm going to talk through three challenges. One is, firms need to maintain a level of fairness, equity inside their boundaries. It's that fairness and equity that generates this culture that gives them, in many ways authority. If one fails to maintain a sense of fairness inside a firm's boundaries, employees tended to disengage motivation drops even more precipitously. To talk a little bit about knowledge atrophy that can incur within the boundaries of the firm, as well as both the advantages and in this case, the disadvantages associated with this community and social attachment that tends to emerge within the firm, all of which impede some of the real advantages to which the market place provides access. So to focus particularly first on this question of social comparison, let me tell you a story about Harvard and Harvard's efforts to bring market like incentives inside the boundaries of their organization. So for years, Harvard was very successful in managing its endowment, has a very large endowment, tens of billions of dollars that it invests and provides a huge portion of the funding of this institution. Now when you have a huge portfolio like this, you tend to allocate it into different types of funds. So Harvard had employees managing a domestic bonds fund and an internal and international bond fund and a equities fund and a foreign equities fund. So they divided it into different categories. At the time that this story plays out, their endowment was about $27 billion. Uniquely, it was almost all internally managed by Harvard employees. They did phenomenally well. They outperformed comparable funds by 50 percent and obviously worth billions in increased endowment and cash being spun off that could be used by Harvard. They at the same time tried to create incentives that arguably partly precipitated this remarkable performance. Their top fund managers managing the Harvard endowment earned on the order of $25-30 million per year. Just to give you a picture of this, here's this David Mittelman who is managing a domestic bonds fund in 04 his performance or that fund's performance returned about 9.2 percent. The benchmark fund in that category lost 3.4 percent. He received in 04, $25 million. In 03, the difference was even greater. He returned about 31 percent, the benchmark returned about 17. His payout was $34 million, jumped down to Maurice Samuels running foreign bonds. Also remarkable difference in performance. He received comparable amounts in terms of payment in those two years. Jeffrey Larson was managing foreign equities and again, eight percent gap in terms of increased return relative to the benchmark in 04 and he receives eight million for that. In 03, his performance is even better, and he gets $17 million here. It's interesting, better performances, he only lost 2.8, but the benchmark lost 6.2. Then Jack Meyer is overseeing the entire operation and he gets seven million dollars and both years. Again, you see in the aggregate, much higher performance than the overall benchmark that they were compared to. This caused complete outrage when this was made public among students, alumni, and faculty. The Harvard president, in trying to respond to this outrage, insisted that the payments would be greater if the activity was outsourced. That is if they gave this management to an outside group, they would have similar types of incentives and in fact, they would be even more high-powered and the payouts would have been even greater. The treasurer also, in trying to respond publicly notes that if the activity was outsourced, that people just wouldn't care. Look, get over yourselves, if we had this thing outsourced, you wouldn't care at all. The only reason this is an issue is because these are Harvard employees. Therein lies the dilemma, right? It's by making these individuals Harvard employees and paying them with these high-powered incentives that you create this dramatic issue of fairness and social comparison inside the organization. Faculty are outraged. These are Nobel Prize winning economists. Economists are Pulitzer Prize winning authors and earning barely six figures at this time period. Here these young fund managers are making $25 million. Alumni are being asked to donate their 10,000 or a $0.5 million, whatever it is. Meanwhile, they're turning around and paying out these fees to those that are managing these funds. Parents of those students who were scrambling to make tuition payments. Meanwhile, they're making these paths. The optics of this, the internal perceptions of fairness were such that it just was unmanageable. As a consequence of this, their pay is cut. Fund managers leave. Harvard shifts toward outsourcing big portions of its endowment management to essentially circumvent this problem, this inability to replicate market incentives inside the boundaries of the firm. Here's a more extensive reaction from Summers who was the head of Harvard at the time. He says, "Most universities hire hedge funds, which pay huge salaries to their best traders. We hire our own traders and therefore pay them huge salaries and people sometimes get upset. The easy thing would be to say we aren't going to do this anymore and hire external managers like everybody else does. But we would then be spending $50-$100 million more a year of our endowment. It would be easier to do inefficient thing and avoid bad publicity, but I don't think it would be the right thing to do." He doesn't get it. This is a pervasive problem at every organization. Trying to create incentives that replicate the market is when they pay out, creates dramatic problems of fairness. The problem is that even though they're very effective with the people that we're targeting, there's dramatic spillover, perceptions of unfairness on the part of everybody else and the cost that those perceptions impose end up being dramatically greater in many instances than the incentive advantage that you're creating in creating high-powered market incentives for the individuals and entities that you're targeting. Let me give you another illustration. This is Tenneco in the oil and gas industry. They make purchase of a small company that's very skilled in exploration, has geologists and geophysicists and engineers that are very, very good at finding oil that bring this activity in and with these individuals. Initially, they promised them that they're going to keep their prior incentives in place, think of that as their market, prior market incentives. The implementation of that customized compensation package that they had promised gets delayed. That's because the Tenneco Vice President of Administration, the individual who's thinking about the spillover effects on everybody else who was going to evaluate the fairness of this and the consequences of perceiving it as unfair, basically delays it and eventually doesn't implement it, claiming that we have to ensure internal equity and apply the same standard of compensation to everyone. The result is these individuals leave in droves. As soon as you change the compensation, these individuals leave. Again, in this instance, you could argue that Tenneco would've been better off leaving this outside, contracting with them for exploration. That way, the incentives continued to be high powered and market like incentives. Soon as you bring them in, you crush those incentives. Why? Because of the social comparison problems. As soon as you reshape the incentives, the talent that you wanted access to leaves. This same dynamic played out in pharma as they started to want to gain access to biotech technology and the individuals and knowledge that was embedded in these small biotech firms. Their initial strategy was to buy these biotech firms. What they found is they would buy them, couldn't replicate the high powered incentives that the market provided them when they were independent and external. You'd buy them, reshape their incentives and the talent they wanted access to, the knowledge they wanted access to left in droves. They therefore pivoted. Now you see much, much less of that buying of these biotech firms and much more simply licensing in their technology, contracting with them to do research, leaving the market incentives in place and making very different decision about this make by choice as it relates to these particular assets. I was doing some work with a utility in the midwest. They told this story of wanting to get into the energy trading business. They started a little energy trading group within the organization. Everything went well, performed well, but then it became public exactly how much these energy traders were making, which was in excess of almost everybody in the executive management team. This created all kinds of friction and problem and basically they just went back to outsourcing the activity. Again, because of their inability to replicate market incentives without imposing dramatic social comparison problems that would influence the rest of the organization. In each of these illustrations, managers attempted to create high-powered market light incentives within the firm. They were always successful in the sense that it generated the desired performance for the activity that they were providing incentives for where they were able to do it. The comparison processes of those that were not part of the plant imposed overwhelming costs on these organizations. In some sense, the trade-off was, "Either we stick with these incentives that are targeted at this particular activity and enjoy those benefits against the trade-off of these very large comparison costs." The fact that people are envious and jealous, they reduced their effort, they complain. Those costs are very often much greater than the incentive benefits that we get from trying to replicate market incentives. Firms need to maintain these fairness norms. Those fairness norms are vital to generating its primary advantage, which is creating a community that generates core specialized investments and generates the coordination and cooperation that's vital to flexibly creating that which they are trying to compose. What are these? Just to be more specific, what are these social comparison costs that are triggered by efforts to replicate market incentives? Well, when people feel that their pay is inequitable, it causes individuals to act in ways that impose costs on the firm, they depart, they reduced their effort, or they engage in costly politicking. One of the things that makes it particularly difficult to differentially reward in an aggressive way compensation within a firm is that people have very, very distorted perceptions of their own contributions. If you ask individuals to evaluate their performance relative to their peers, this is based on a study I did decades ago looking at engineers in Silicon Valley in two different companies, ask them how they evaluate their performance relative to their peers. There was only one individual across 700 plus engineers that felt that his or her performance was below average. In these two companies, 90 percent plus felt that they were in the top quartile, and 33 and 42 percent thought they were in the top five percent in terms of performance. People who have that very, very exaggerated perception of their own contribution to try to step in and have very, very aggressive market-like performance incentives becomes very difficult to do. Very often it's much more efficient to just flatten compensation with a message of, we're all in this together, we elevate pay based on job class and rank, and much less about individual measurable performance because it becomes very difficult to do, especially in a collaborative environment where any individual's output is an artifact of lots and lots of other people's contributions. The general proposition is that in choosing what's integrate and in choosing also the structure of compensation for that which you choose to integrate, managers have to take into account the social comparison costs. These costs associated with failing to generate perceived fairness. Very often the easiest thing to do is to just flatten compensation, not try to replicate market incentives in order to maintain fairness that's so vital to creating the culture that you want to compose within a firm. How do you constrain and manage these social comparison costs? Well, you can change the boundary of the firm. Just like the farmers companies did, you just choose not to internally source these activities or like the utility, you just keep those things outside or push them back outside or as Harvard did, you push them outside. You may choose to try to isolate individuals with different pay levels, but that may not be very optimal for the kind of production design you're attempting to compose. Most frequently, you just restrict variants in pay. You dampen pay for performance. You just give up on trying to replicate market incentives. Very quickly, the other two things that happened inside firms that compromise its efforts to be able to replicate the market. One is that as soon as you take an activity and move it inside the firm, give it essentially one internal customer, it's no longer being pushed and prodded by a multitude of customers to update their skills to keep their cost structure low, now you're only having to satisfy one internal customer, and this tends to breed competence, knowledge atrophy, you tend to not keep those skills up-to-date. Think of this in the context of The Saturday Evening Post example in this huge printing operation that they composed. While initially, that may have been very low cost and very efficient. Over time, given that they only have one customer, they tend to get lazy and inefficient in an organizational sense. Finally, well, one of the advantages of integration is that it builds this community and culture. These social attachments that get composed inside firms can also be problematic because they can begin to cloud decision-making. In this sense, it's very difficult for instance to shut off funding for a project, or once something is inside the firm, it becomes very difficult to say, you're no longer the best, you're no longer efficient, and to move them outside. Therefore there's some inertia associated with these decisions to integrate, and one wants to be very careful about integrating an activity because once it's integrated, it's very difficult to move it back outside the firm. To summarize then, the market has some enormous benefits to motivate a broad set of actors that are much smarter than you in a collective sense, and you should go that path if it works. There are a specific set of situations where markets may fail, and that's going to involve co-specialization and coordination, clunk complex coordination, tacit knowledge transfer. Hierarchies have or integration has some real benefits. There's capacity to access command and control, and there's capacity to create a collaborative culture. At the same time, the cost of accessing those advantages is the inability to replicate the market's benefits. That is, the cost of control is the loss of motivation, loss of the market's motivation. In addition, you have this knowledge atrophy problem as well as an oversocialization. It's difficult to extract things once they've been embedded within the firm. To this point, we've really only talked about two dichotomous choice between markets and vertical integration. Of course, there is an intermediate option which is to compose an alliance, a close collaborative relationship. One that might facilitate some levels of co-specialization, that might facilitate closer coordination, that might facilitate this kind of knowledge transfer. So one can think about this in a more continuous sense that for intermediate levels of co-specialization and coordination alliances may end up being very effective, and it's only when these things become particularly high level that total vertical integration is required. Alliances are these collaborative partnerships. Some would argue that more and more business has moved toward being conducted through alliances as opposed to arm's length transactions. This is a statistic that was generated by an accounting firm some years ago. I don't know exactly how accurate this is, but it does give you a sense and I think there is a shared sense that more and more businesses become organized through collaborative alliances as opposed to combative market-like ties. Firms that learn to be more efficient in managing their business through alliances, as well as firms that become more efficient in using markets, as well as firms that become more efficient at internally managing activities are likely to see an increased portion of their exchanges managed in that particular way. So if you think about a very simple model here, where we've got transaction difficulty here arrayed along the X-axis and the costs of managing those exchanges on the Y-axis. You think about each of these curves representing a particular organization technology or governance technology. Markets here are very low cost when transactions are very easy. Here, this is the lowest cost approach. However, when transactions become very difficult to manage here, the lowest cost approach becomes vertical integration. Here in this intermediate section, where transaction difficulty is moderate, we see that the lowest cost approach is alliances. Now, what happens as firms become more efficient at performing any one of these approaches to organization? So what happens as a firm improves in its capacity to manage alliances, you see a larger portion of their transactions being managed through alliances just become better at organizing this particular way, or perhaps they become better at managing through markets. Then you're going to see a much larger portion of their exchanges managed in this way. Technologies like information technology, EDI, Blockchain may all improve and have improved the capacity of firms to manage through the market. As a consequence of this, it causes firms to shift more of their management of activities through that particular governance mode. All of that is to say that there are some important dynamics associated with how one manages these activities, and one wants to, as new technologies emerge, as Beck's practices emerge, those are going to shape what's the optimal choice between make, buy, and ally. A few summary comments, the object is to compose the activities and assets that your theory reveals. You then need to make a decision about how to organize these transactions to access these activities and assets that are critical to what you want to compose, critical to your efforts to create value and capture value. I think you need to be very wary of our general intuition, which is often to seek greater control. We need to own this is a critical input for us. Everything is a critical input. There's nothing in this mix of activities and assets that's not a critical input. The real question is, what's the type of control that you need in order to access that particular critical input? Lots of mistakes get made because firms go out and pursue integration that they shouldn't have. It also going to happen in the other direction. There are instances where you mistakenly don't integrate and you wish you did afterward. You need to understand, I think importantly, the central role of co-specialization and how it elevates transaction difficulty. I think this is a key driver of this push from markets to alliances and on toward vertical integration. Then finally, you do need to think a little bit about the dynamics of governance. We talked a little bit about how technologies can change, enable particular governance approaches to be more efficient. But in addition to that, things can change over time. Exchanges that used to be very co-specialized often become less co-specialized over time. Something that was very unique that you needed access to originally, overtime, lots and lots of different suppliers have emerged that can do that exact thing, and it's now less co-specialized. So firms need to be ready to pivot and move activities that they had made correct decisions perhaps originally to internalize. They now need to think carefully about outsourcing as a way to now access these high-powered incentives that the market enables. All right, thank you.