Econ 426W

Greg Dow

Introductory Lecture Notes

September 10, 2021

Welcome to Econ 426!

<u>Contact information</u>.

My office is WMC 4659 (one floor up from the main econ office, in the far northwestern corner of the building). I will announce weekly office hours soon.

My office phone is 778-782-5502. However, often I'm not there and sometimes I forget to check voice mails.

By far the best way to get in touch is by email: gdow@sfu.ca

My web site is: http://www.sfu.ca/~gdow/

I will post all of the course material on Canvas so you don't need to use my web address. Also, I haven't yet updated the web site for the fall 2021 semester. But if you are curious about my academic career or my research activities, you may want to take a look.

<u>Covid-19 information</u>.

See the one-page handout for guidelines.

I am fully vaccinated, and I strongly encourage everyone else to get vaccinated too.

If you are feeling unwell, please do not come to class. One or two absences of this kind will not affect your participation grade.

We may have to use online teaching during part of the semester, depending on how the Covid situation goes. I have back-up plans for lectures, class discussions, papers, and the final exam if this happens, but I am hoping it won't.

<u>What is the course about</u>?

This is a course about the organization of firms. Specific topics vary with the instructor. I base the course on my book "Governing the Firm" (2003), which we will read carefully and discuss throughout the semester.

I wrote the book because for a long time I have been thinking about the following puzzle: Why are large firms usually controlled by capital suppliers rather than labor suppliers?

The preface of the book explains how I became interested in this question. The book was an attempt to answer it. I am still not certain I know the answer, although I believe some answers are more likely to be true than others. As the semester proceeds, I hope you will start to see why this is an interesting question and develop your own opinions about what the answer(s) might be.

<u>Getting the textbook</u>.

You can get the book for free by going to the SFU library web site. Search for "Gregory K. Dow Governing the Firm", and you should be able to access the full text. If you have any problems with this, please let me know.

You could also order a permanent digital copy through the SFU Bookstore but this costs money. Unfortunately, they are not selling hard copies.

If you prefer a paperback, you can go to any reputable online book seller. Amazon has paperbacks for about $47 CDN and should have relatively fast delivery. Again, please let me know if problems arise.

You will need to refer to the textbook during class discussions, so you should either have it on a convenient electronic device or buy the paperback and bring it to class.

CAUTION: Do not use my other book called "The Labor-Managed Firm: Theoretical Foundations" (2018). It is more theoretical and intended for faculty and grad students.

<u>Grading</u>.

There are two written assignments, class participation, and a final exam. Each of these four components is worth 25% of the course grade.

Canvas materials.

You will find the following materials on Canvas.

1.   The course outline.

2.   A document about class participation.

3.   A document about the written assignments.

4.   A bibliography you will need for the written assignments.

5.   A collection of old exams from the last decade.

You should read items 1, 2, and 3 in the next day or two. There is no need to think about items 4 and 5 right now. I will discuss those later.

Class participation.

This part of the course is explained in detail in item 2 above, but I will say a few words about it here. The book has 12 chapters and I have designed the schedule so that we can go at the rate of one chapter per week. For most weeks, we will have a class discussion on Tuesday. A team of two students will lead each discussion and I will try to be quiet.

We will begin this process with chapter 2 of the book on Tuesday September 21.

You should start thinking about a date and chapter for which you would like to lead the discussion. It would be useful to rank your top three choices. Here are the options:

September 21   Chapter 2
September 28   Chapter 3
October 5   Chapter 4
October 12   Chapter 5
October 19   Chapter 6
October 26   Chapter 7
November 2   Chapter 8
November 9   Chapter 9
November 16   Chapter 10

By this point everyone should have helped to lead one discussion. I would like to reserve the last two chapters for myself:

November 23   Chapter 11
November 30   Chapter 12

If you are curious about the topics for each chapter, see the table of contents in the book. I will also describe the chapter topics in class. In the first week of the semester I will ask about your preferences and draw up a schedule for who will lead which discussion.

NOTE: If you are not feeling well when it is your turn to lead the class discussion, please give me as much warning as you can. I will take over on that day, and we will find a way for you to lead a discussion later.

For the Friday classes, I will give a more conventional lecture. I will usually comment on the class discussion from Tuesday. I may also introduce new material, present economic models, talk about the written assignments, and so on.

Written assignments.

For information on this, see the document about written assignments posted on Canvas.

Here are the key deadlines:

A preliminary draft of the first paper is due on **Friday October 8**.
The final version of the first paper is due on **Friday October 22**.

A preliminary draft of the second paper is due on **Tuesday November 16**.
The final version of the second paper is due on **Tuesday November 30**.

Old exams.

There is no rush, but during the next couple of weeks you should glance through the old final exams on Canvas in order to see what they look like.

These are useful for two main reasons. First, they function as a study guide by indicating the ideas and issues I think are important. It should be relatively easy to see which of the old exam questions apply to each chapter of the book. This will give you valuable clues about how to focus your reading and about some key points in the class discussions. For these reasons, I recommend looking through the old exams on a weekly basis to see how they relate to the material we are currently covering.

Second, they will be valuable in studying for the final exam. For example, you will get a good sense of the style of my questions, and about specific topics that might come up.

<u>Lecture notes</u>.

For most of my career, I have resisted requests to post my lecture notes. The reason is that I believe students learn much more when they take their own notes. This requires that students absorb what I am saying and writing on the board, process the information, and make decisions in real time about what is most important, how ideas are related, and so on. Organizing your own notes later is also a valuable part of the learning experience.

However, during the pandemic I had to move my courses online, and one consequence was that I had to write up lecture notes for electronic distribution. These notes from the spring of 2021 are no doubt floating around, and it would be unfair for some students to have access to them while others do not.

For this reason, about once or twice per week I will send lecture notes by email and post them on Canvas. I will do this after I give the corresponding lecture in class.

PLEASE don't rely heavily on my notes. Trust me, you will gain a deeper understanding of the material if you take detailed notes yourself when I give a lecture, and only use my notes as a supplement for later review.

That's all for now. Be thinking about your top three choices for chapters where you want to help lead the discussion. I'll ask about this by email early next week and organize the schedule.

Econ 426W

Greg Dow

September 14, 2021

Lecture Notes on Chapter 1

Here are a few general comments on chapter 1 of "Governing the Firm". This will give you some background information and a preliminary orientation to the subject matter.

1.1   <u>Economic Systems</u>

Most people would probably say that Canada has a capitalist economy. But what do we mean by capitalism?

Some people might define capitalism to be a system where there are markets for goods and services. But many other things besides capital are traded on markets. So why don't we call such a system 'marketism'?

Other people might define capitalism to be a system where individuals or groups are free to create new firms and obtain a profit from buying and selling things. But again, it is not clear how this is related to capital, which is just one of the inputs a firm might use. We could instead call such a system 'entrepreneurialism'.

These concepts don't get us very far. Let's back up and think about some history.

If you had taken a course on "Comparative Economic Systems" in a North American university during the Cold War, the professor would probably have started the course by distinguishing between capitalism and socialism.

The ideological foundations of the Cold War were based on this distinction between two rival economic systems, with the U.S. as the leading example of capitalism and the Soviet Union as the leading example of socialism.

The professor would have said that in capitalist countries, the physical assets required for production activities (such as factories) were owned by private individuals or firms, while in socialist countries, these assets were owned by the state.

The professor would probably also have said that western countries mainly used markets to allocate resources, while Soviet-bloc countries used central planning instead.

So one alternative to capitalism involves asset ownership by the state.

However, there is another alternative to capitalism, one that has nothing to do with state *ownership*. Instead the issue involves *control* over production: who decides what will be produced, what methods will be used, what individual workers will do, and so on.

At least since the Industrial Revolution, some people have argued that firms should be managed by workers rather than investors. For one example, see the quote from John Stuart Mill, a famous 19th century British economist, at the beginning of the book.

Next take a look at Table 1.1 on p. 3 of the book. Here I distinguish types of firms on two independent dimensions: private versus public asset ownership (the columns) and control by capital versus control by labor (the rows). There are four combinations so in principle we could have four types of firms. There are historical cases of all four kinds.

In this course we are not concerned with the right column, which involves public asset ownership. Our attention will be entirely focused on the left column, where assets are private owned. I will always assume there are markets for capital, labor, and other goods so the idea of central planning is irrelevant and will be ignored.

Assuming private ownership of productive assets, firms controlled by capital suppliers would normally be called capitalist firms. Firms controlled by labor suppliers could be called 'laborist' firms, although no one really uses that terminology.

I prefer to use the terms 'capital-managed firm' (KMF) and 'labor-managed firm' (LMF). A KMF is a firm controlled or managed by its capital suppliers, and an LMF is a firm controlled or managed by its labor suppliers.

The K in KMF comes from the standard use of the algebraic symbol K for capital when people are writing down economic models.

Although we will not talk about the right column of Table 1.1 in this course, I will say a few things about these cases. For a 'socialist' firm, two things are true simultaneously: productive assets are owned by the public sector, and the firm is managed or controlled by people in the public sector. This was true for the Soviet-bloc countries.

Another possibility is a combination of public asset ownership with control by workers. This combination is rare but has happened. For example, in the former Yugoslavia (from 1949-1991), there was a system called 'self-management' that had this combination.

Now let's go back to the left column with private asset ownership.

I will use a simple definition of capitalism: it is an economic system in which most large firms are controlled by capital suppliers (that is, where most large firms are KMFs).

So the question is: why do we have capitalism? At least theoretically, we could have a system in which most large firms are controlled by labor suppliers (that is, where most large firms are LMFs). Of course, this is not what we observe.

You might think that private asset ownership automatically implies capitalism. A lot of people would use the following argument: someone who owns a productive asset such as a factory has the right to decide how that asset will be used. Therefore, that person has a right to manage any firm that uses their asset. So obviously we should have KMFs.

One problem with this argument is that I could also say people have the right to decide what to do with their labor time. Therefore the people supplying labor to a firm have a right to decide how the firm is managed. So obviously we should have LMFs.

Clearly this doesn't get us very far. To show that private asset ownership does not imply a right to manage the firm, it is helpful to think about the relationship between a landlord and a tenant (if you have ever rented an apartment, you'll know what I'm talking about).

Suppose a landlord owns an apartment and you are renting it. Can the landlord tell you when to get up in the morning, when to take a shower, whether you can invite a friend to visit, etc.? No. Within very broad limits, you can decide how to use the apartment. The rental contract will probably impose a few restrictions (maybe you can't have a dog or use the apartment in dangerous ways) but usually that's about it. Subject to constraints of that kind (and paying the rent on time), you can manage the activities at the apartment. Most rental contracts even impose limits on the ability of the landlord to visit the apartment (it is usually necessary to give the tenant advance notice rather doing surprise inspections).

Similarly, firms often rent or lease productive assets from outsiders. For example, a firm may rent an office, machinery, computers, trucks, or aircraft from an outside owner. The owner of the asset doesn't generally tell the user of the asset what to do, although as in the apartment case, there may be some broad constraints (e.g., the user must use the asset in a careful way to protect its economic value).

So one way in which we could have LMFs is fairly straightforward: groups of workers who don't own any productive assets could go to the market, rent the assets they need, and set up a firm. The workers can then decide how the assets will be used.

There are other ways to have LMFs. For example, a group of workers who don't have any productive assets could go to the bank, borrow some money, use the money to buy assets that they collectively own, and pay off the loan using the revenue obtained from their production activities.

Or if they happen to have some savings, the workers could pool their money, buy some physical assets, and supply both labor and capital to the firm. If voting rights are tied to contributions of labor rather than contributions of capital, I would call this an LMF.

The point is that just being a capital supplier doesn't automatically imply that you will manage the firm. Nor does being a labor supplier automatically imply that you will run the firm. Who runs the firm depends on the nature of the contracts made between labor suppliers and capital suppliers.

Therefore, even in an economy with private asset ownership, capitalism isn't something that exists by definition. It is a pattern that needs to be explained.

1.2   The Control Dimension

One feature of firms (to be discussed more in chapter 5) is that they involve incomplete contracts. This occurs because it is usually impossible to spell out in advance what each input supplier must do at every point in the future, in every possible situation.

In the real world, there must be some way of making decisions when contracts don't say what people should do. Firms handle this problem through authority relationships. The top managers make strategic decisions, middle managers implement these decisions, the lower level managers run things from one day to the next, and so on.

Examples of decisions that might not be spelled out in contracts include where to build a factory or an office complex, what products to make, how to market the product, where to get the raw materials, what incentive system to use, and what working conditions to have.

In a conventional corporation, the shareholders choose the board of directors, which then chooses the top managers. Since the shareholders are generally capital suppliers, this is a KMF. But it would also be possible for employees to choose the board of directors, and then have the directors choose the top managers, which would give an LMF.

I like the terms KMF and LMF because they focus attention directly on the relationship between supplying a particular input and having control over the firm. There are a lot of alternative labels for LMFs such as worker-managed firms, worker-owned firms, worker-controlled firms, worker cooperatives, and so on. Don't worry about these differences in terminology, they all mean more or less the same thing.

One definitional issue arises when the same people are supplying both capital and labor. Is this a KMF or an LMF? Such issues are common for small firms (like a mom-and-pop grocery store). However, the same issue could arise in large firms where employees own shares in the firm (we will discuss employee stock ownership plans in chapter 4).

In such cases I look at voting rights. If people have votes proportional to the amount of capital each person has supplied, I would call the firm a KMF. If votes are proportional to the amount of labor each person has supplied, I would call the firm an LMF.

When the firm is large enough to have a formal decision-making system, it is usually easy enough to apply this criterion. However, we may not be able to say much when a small firm is managed in an informal way. In cases of this kind it may be unclear how control rights are connected to the supply of any particular input.

1.3   <u>Looking for Clues</u>

Economists are frequently interested in how firms are organized. Such questions arise in labor economics, comparative economics, industrial organization, economic history, and finance, among other fields.

You might think that economists would have figured out a long time ago why most large firms are KMFs. However, economists have not yet reached a consensus about this.

The problem is not that we have too few theories. The problem is that we have too many. Often when I talk with people about this question, they immediately think that they know the answer. But unfortunately different people give different answers.

For example, some people think LMFs are rare because they have poor work incentives. Other people think they are rare because workers have trouble getting capital. And other people think they are rare because workers are risk averse.

When I wrote *Governing the Firm* in 2003, there was a lot of theory about LMFs but not much empirical research. We had case studies but relatively few papers in which people tested hypotheses using econometrics. Today this has changed.

During the last two decades we have had many new econometric studies of LMFs, often using high-quality data and clever statistical techniques. As a result, to some degree the theoretical side has now fallen behind the empirical side of the literature.

I attempted to address this situation in my book *The Labor-Managed Firm: Theoretical Foundations* (2018). Part of the reason for writing that book was to create a theoretical framework that would be consistent with the more recent empirical findings.

Much of the economic literature on LMFs has traditionally been concerned about whether workers' control is good or bad (normative issues). This is important, but we also need to figure out why it is rare and why it occurs when it does (positive issues). It is difficult to have an informed opinion about the normative issues if you do not have good information about the positive issues.

In the textbook, you will find that normative discussion is generally confined to chapters 2 and 12. Most of the book is more concerned with positive economics (descriptions of the world and attempts to explain why the world is the way it is).

Let's start with a few broad generalizations about the kinds of industries where we do see LMFs. They tend to be most common in the following areas:

(a)   professional services (law, medicine, accounting, engineering, architecture, etc.)
(b)   craft manufacturing (furniture, glassware, publishing, etc.)
(c)   low-skill services (reforestation, taxi cabs, etc.)
(d)   construction (especially in western European countries)

Notice that these all tend to be labor-intensive industries (we'll come back to this later).

We rarely or never observe LMFs in mining, auto manufacturing, chemical production, or oil refining. Notice that these all tend to be capital-intensive industries.

Ideally, a good theory would explain all of the following things:

(a)   the rarity of LMFs in the economy as a whole (measured by total employment, assets, sales, or similar indicators)
(b)   their distribution across different industries
(c)   conversions of KMFs into LMFs or vice versa
(d)   the design and organization of LMFs when they do exist.

Where can we start with this? Is there anything in Econ 201 or 302 that would help?

The problem is that in economic theory, people usually don't make much of a distinction between capital and labor. They are both treated as inputs that are bought on a market at a price, where a firm chooses inputs to maximize profit or minimize cost (think about the standard long run graph showing cost minimization using isoquants and isocost lines).

To make any progress in explaining the differences between KMFs and LMFs, we first have to identify some significant difference in the characteristics of capital and labor.

The next thing we have to do is link up the difference between capital and labor to some differences in the behavior or performance of KMFs and LMFs (how often each of them is created, under what conditions this happens, what their productivity or survival rates look like, and so on).

Then we have to link up these differences in behavior or performance with patterns we observe in the world, such as the ways in which LMFs are distributed across industries.

I think the most important difference between K and L involves the idea of alienability.

We normally say that capital is *alienable*, in the sense that it is easy to transfer ownership of physical assets from one person or group to another.

By contrast, labor is *inalienable*. One person cannot buy someone else's talents, skills, or experiences. It is also true that we all have 24 hours per day, and I cannot buy 12 of your hours in order to have 36 hours per day.

This difference in alienability has a number of implications. For example:

A firm can own physical capital but it can only rent human capital.

There are natural limits on the labor that can be supplied by an individual worker, but there is no upper bound on the capital that can be owned by an individual investor.

Workers may have to be located in close physical proximity in order to produce output, but investors can be located anywhere.

Individuals who supply labor have heterogeneous characteristics (they differ in their skills, experience, motivation, and so on), while financial capital is homogeneous.

Individuals who supply labor get direct utility from their working conditions, while individuals who supply capital do not.

These factors may be relevant in constructing a theory about KMFs and LMFs. But we have to relate differences in the nature of capital and labor to the ways in which control rights are used in each type of firm, because we need to know why KMFs would behave or perform differently from LMFs.

Finally, we have to say how all of this leads to asymmetries between KMFs and LMFs in the real world, such as differences in the way firms are distributed across industries.

This is a large agenda, and we will see how far we can get with it.

1.4   A Projected Synthesis

This section of the book is a preview of ideas that will be developed more fully when we get to chapter 11. If some of this doesn't make much sense right now, don't worry, we'll come back to these ideas later when we know more.

Here are the basic points:

A firm is a set of input suppliers connected through authority relationships.

A firm is ultimately controlled either by K or L (we ignore other possibilities).

The controllers of the firm take their own interests into account directly, but take account of the interests of non-controllers only indirectly (for example, through market prices).

There are three main issues that influence which group controls the firm. Later we will relate these issues to the difference in alienability between K and L.

Credible commitment.

How do controllers make believable commitments to non-controllers? This is generally necessary if the controllers want to convince the non-controllers to supply their inputs.

In a KMF, suppose investors promise that if the employees work hard or invest in skills today, they will be paid more tomorrow. Should the employees believe this promise?

In an LMF, suppose workers promise that if lenders provide a loan today, the loan will be returned with interest tomorrow. Should the lenders believe this promise?

I will argue that the difference in alienability leads to asymmetries in the credibility of the commitments each type of firm can make to non-controllers. I will argue that KMFs tend to have an easier time making credible commitments to labor suppliers than LMFs would have in making credible commitments to capital suppliers.

Composition of control groups.

This breaks down into two issues: size and heterogeneity.

First, consider size. A KMF of a given scale could have one investor, a few investors, or many investors. Thus there is some flexibility in the size of the control group. An LMF of the same scale must have a controlling group whose size is approximately equal to the number of employees. This can be important because when control groups are large they tend to have bargaining or free rider problems.

Second, consider heterogeneity. Some people make the following argument. Investors have homogeneous preferences because they all want to maximize profit or present value. But workers have heterogeneous preferences because they want different things: some care a lot about wages, others care more about job security or working conditions, and so on. If KMFs tend to have homogeneous control groups while LMFs tend to have more heterogeneous control groups, this could cause problems for LMFs.

For these arguments to make economic sense, we have to find a way of connecting them to differences in the nature of capital and labor. Again, I will argue that alienability plays a role.

Commodification of control rights.

The issue here is whether the position of being a controller in a firm is something that can be treated as a commodity, so that such positions can be bought and sold on a market.

In a KMF, it is relatively easy to buy and sell the right to be a shareholder. This happens all the time in stock markets. When person A buys a share in a corporation from person B, person A gets the right to receive dividends, the right to vote for the board of directors, and in effect takes over B's role as a capital supplier.

This is much more difficult in an LMF. In principle it would be possible for person A to buy a membership right from person B, so that A takes over B's role as a labor supplier. There are some LMFs that have membership markets of this kind, but it is not common, and it is hard to make such markets function smoothly.

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We will see that this leads to *imperfect appropriation*, which means that current members of the LMF are unable to charge new members a price that entirely captures what the new members are willing to pay, or what a membership position is really worth. This causes problems with the creation of new LMFs and the conversion of KMFs into LMFs.

As with credible commitment and the composition of control groups, I will argue that the difference between KMFs and LMFs with respect to commodification of control rights is due to the difference in alienability between K and L.

I'll stop at this point. Section 1.5 describes the organization of the book and there is no need to say more about that here.

Econ 426W

Greg Dow

September 17, 2021

Lecture Notes on Privatization of TVEs in China

The following material is not included in the book *Governing the Firm*. The research here is from a paper by Xiao-yuan Dong (University of Winnipeg), Paul Bowles (U. of Northern British Columbia), and Sam Ho (University of British Columbia).

I want to discuss this research because it raises a question relevant for the course: what determines whether employees will buy shares in the firms where they work?

Some background: Township and village enterprises (TVEs) were firms owned by local governments in China during the early and mid-1990s. To picture how these firms were organized, think about the city of Burnaby where SFU is located. Imagine that the city government owns a factory that does light manufacturing (producing consumer goods). The firm has about 200-300 employees and the manager is chosen by the mayor or city council of Burnaby.

In the mid 1990s, the Chinese government decided to privatize these kinds of firms, and during 1995-2000 millions of firms were sold to private owners. The buyers tended to be the managers of the firms, but in some cases employees or other private investors bought shares. By the end of 1998, about 80% of TVEs had been transformed in this way. The goal of the process was to strengthen the incentives for good managerial performance.

The authors Dong, Bowles, and Ho collected detailed data on 45 firms. In each firm they interviewed around 25 employees to get data on the employee's age, sex, education, and work experience, as well as their wages, bonuses, interest income, dividend income, and number of shares owned. They also collected data on the characteristics of the firm.

Of the 45 firms studied, 39 were privatized and 6 remained owned by local governments.

Among the 39 firms that were privatized, in 33 cases the manager or the manager plus the board of directors owned at least 50% of the shares. In the other 6 cases, the employees as a group owned at least 50% of the shares.

There were two main methods of privatization.

1. In smaller firms, the firm would be sold directly to the manager. The price paid by the manager was determined through negotiation between the manager and local government with payment occurring over a three-year period. In these cases, employees did not have an opportunity to buy shares.

2. In larger firms, there were two stages. First, the local government sold the firm to a legal entity controlled by the manager, again at a price negotiated between the two. At this point the manager would reorganize the firm as a shareholding company. Second, the manager could then sell some shares to employees or outside investors (the manager could also choose to keep some or all of the shares).

The authors wanted to answer the following question:

What factors influence the probability that an individual employee will own some shares (more than zero)?

The authors were not concerned with how many shares the employee owned, or what the value of the shares might be, just whether or not the employee had some. Overall, 33% of the employees in the sample did own some shares in the firms where they worked.

Note that there are two things going on here. In order for an employee to own any shares, both of the following must be true: (a) the manager must be willing to make some shares available and (b) the employee must be willing to buy the shares at the price decided by the manager (perhaps with some bargaining between the two). So there are both supply and demand issues to consider.

The statistical technique used by the authors is called probit regression. If you have not heard of this, don't worry about it. The basic idea is that the dependent variable is zero or one (the employee either does not own any shares, or does own some). The independent variables are the characteristics of the employee and the firm.

Using this technique, the authors were able to determine which variables had positive or negative effects on the probability that an individual employee would own some shares.

The total sample consisted of observations on 753 individual workers.

See the next page for a list of variables that had positive effects (made employee share ownership more likely) and a list of variables that had negative effects (made employee share ownership less likely). All of the effects were statistically significant at standard levels (0.10 or better).

Variables with positive effects on employee share ownership	Variables with negative effects on employee share ownership
large firm size	standard deviation of profit
high ratio of profit/assets	firm has a shortage of capital
high ratio of assets/employee	employee age
high prospect of layoff (manager thinks that reducing the workforce by 10% would increase profit)	employee education
	employee is a migrant
firm has labor constraints (manager says it is hard to get skilled labor, or it is hard to get workers to provide effort)	% of workforce who are migrants
employee has high seniority (has been in the firm for a long time)	
employee is a member of managerial staff	
employee is male	
employee has high family income	

Possible interpretations for the variables with positive effects.

1. Firm size probably reflects the rules for the privatization process. Smaller firms were sold directly to the manager without any employee involvement, but in larger firms there was a second stage where managers could offer shares to employees.

2. A firm with a high profit relative to the value of its assets is doing well financially. You might think that this has an obvious interpretation: workers want to buy shares in a profitable firm. But keep in mind that the employees have to pay for the shares, and if the firm is very profitable the manager is likely to demand a high price. So the story is not quite so obvious. One possible explanation is that when a firm is highly profitable, the local government pressures the manager to share some of the profit with workers by offering them shares at a price the workers would find attractive.

3. A high ratio of assets per employee means the firm is relatively capital intensive. The manager may have limited personal wealth and may need some financial assistance from the employees in order to buy the firm. Thus the manager sells some shares to workers.

4. If the manager thinks it would be profitable to reduce the workforce, then individual employees have to be concerned that they might lose their jobs. Maybe they want to buy shares because this provides some insurance: if they lose their jobs but profit goes up, at least they get a financial return from their share ownership.

5. The way the authors defined labor constraints, this could be either of two things (or both): the manager might think that offering share ownership will help to attract skilled workers, or the manager might think that employees who own shares will work harder.

6. Workers who have high seniority have been employed by the firm for a long time. The manager might offer them shares at an attractive price to reward their loyalty, or because they have unique skills and the manager does not want to lose them.

7. For an employee who is a member of the managerial staff, the reasons may be similar to those in point 6. There may also be incentive reasons (keep in mind that privatization of TVEs was carried out in order to strengthen managerial incentives).

8. It is not surprising that males were given preference over females for access to share ownership. Unfortunately gender discrimination is common around the world. It might also be true that males had more wealth available to buy shares when they were offered.

9. Employees with high family incomes would have more financial resources with which to buy shares, and maybe greater demand (assuming share ownership is a normal good).

<u>Possible interpretations for the variables with negative effects</u>.

1. If the standard deviation of profit is high, this means that profit moves up and down a lot from one year to the next. The simplest explanation here is that employees tend to be risk averse, so if there is more variation in profit, employees have less demand for shares in the firm. Therefore managers gain less by offering to sell shares.

2. Shortage of capital just means that the firm cannot get as much capital as the manager would like to have. It is unclear why such a shortage would have a negative effect on the employee share ownership variable (you might think that if there is a shortage, a manager would be more inclined to sell shares to employees and use them as a source of capital). The authors suggest that banks may not like employee share ownership, so if a manager wants to get a loan from a bank, the manager will not make shares available to workers.

3. Older workers are less likely to own shares. The explanation is not obvious, but it could be that older workers are more risk averse. In western countries, people who are getting close to retirement age tend to avoid risky investments and prefer safer ones. It could also be true that there are generational differences; maybe older workers did not have the same opportunities to accumulate wealth as younger people.

4. More educated workers are less likely to own shares. Again, the explanation is not obvious. Maybe this is a problem of asymmetric information where the manager knows more about the true profitability of the firm than workers, and educated employees are better able to avoid buying shares in bad firms. Or maybe they are more mobile and have a higher probability of leaving the local community, so they are less interested in making a long-term financial commitment to the firm.

5. If the employee is a migrant, s/he is less likely to stay for a long time at the firm and probably has less interest in making a long-term investment in the firm.

6. Even if the individual employee is not a migrant, most other employees could be. In this case, the manager will probably expect relatively few employees to buy shares, and therefore is unlikely to create any program for employee share ownership.

There has been a lot of research on employee share ownership in western countries (we will discuss employee stock ownership plans in the U.S. in chapter 4).

You might want to think about whether the positive and negative effects on employee share ownership described above would also apply to western countries.

It turns out that some effects are similar (firm size, seniority, and family income tend to have positive effects). However, other effects tend to be different (in western countries, age and education tend to have positive effects rather than negative ones).

Here are some remarks on Chapter 2 of "Governing the Firm". I will skip over section 2.1 and go directly to the other sections.

2.2   Equality

One idea many people have when they first hear about labor-managed firms is that every worker will be paid the same amount. People tend to draw two conclusions from this: (a) it will be hard to recruit and retain skilled workers and (b) LMFs will have problems with work incentives, free riding, and so on.

On point (a): An LMF does not have to pay all its workers the same amount, and most of them don't. The members often give skilled workers or managers more pay. But it does appear to be true that there is generally greater wage compression in LMFs as compared with similar KMFs. The result is that workers at the lower end of the distribution tend to receive more than what a KMF would pay, and workers at the upper end (managerial and professional) tend to receive less than what a KMF would pay.

On point (b): Some economists do argue that LMFs are rare mainly due to problems with work incentives. We will come to this issue in Chapter 8. But one question we might ask is why LMFs couldn't use the same incentive systems as KMFs. At least in principle, an LMF could use bonuses, promotions, or firing threats to motivate people if the members believe those practices will be useful. Another question we can ask is whether real LMFs have any big problems with productivity or survival (which you might expect if you think they have problems with work incentives). We will see later that the answer seems to be no, so probably they are rare for other reasons.

One major question is whether LMFs would help to promote greater economic equality. There are several distinct issues here. First, we need to say whether we are talking about converting one KMF into an LMF while all other firms continue to be KMFs, or whether we are talking about converting all firms into LMFs simultaneously.

Realistically LMFs will need to co-exist with KMFs for the foreseeable future and will probably account for a small part of the overall economy. This means that there will be opportunities for managers, professionals, and other skilled workers to escape from LMF wage compression by working at KMFs instead. Therefore the labor market will impose constraints on how much equality can exist within an individual LMF.

However, there could be a subset of managers willing to work in LMFs for non-financial reasons, and they might do so even if they are paid less than they could get in KMFs. It does appear to be true in the real world that LMF managers test higher on characteristics like altruism than similar KMF managers. Also wage compression tends to imply higher wages for people below the median wage within the firm relative to similar KMFs. This is likely to give LMFs an advantage in attracting, retaining, and motivating high-quality workers within this part of the distribution.

Hypothetically, what would happen if all firms changed into LMFs simultaneously? This would probably make it possible to have greater wage equality because LMFs would only be competing for labor with each other, not with KMFs. On the other hand, the managers in many LMFs might not be so altruistic (there could be a limited supply of mangers who have preferences of this kind). And I would still expect some inequality across firms due to differences in location, technology, monopoly power, and similar factors.

There is also a deeper question about inequality: the returns to labor versus the returns to capital. In the developed economies, approximately 2/3 of national income is paid out as labor income and around 1/3 is paid as property income (let's call this capital, although it also includes land and natural resources). Even in an economy where all firms are LMFs, capital is a necessary input and firms will have to pay for it (by renting assets, by means of interest on loans, via the opportunity cost of the income workers could have deposited in retirement accounts but invested in the firm instead, or in other ways). It is not clear to me why transforming all firms into LMFs would have much effect on the distribution of income between the suppliers of labor and capital. Accordingly, if ownership of capital is highly unequal, the distribution of income among individuals will also be unequal.

For these reasons, I am not optimistic that LMFs will do much to equalize incomes in the society as a whole, although they will probably result in more equal wage distributions in individual firms. If you want to reduce overall economic inequality, I recommend other policies like wealth taxes, progressive income taxes, and generous social programs.

2.3   Democracy

As explained in the book, some authors argue that because democracy is a good thing for governments, it would also be a good thing for firms.

Does this make sense? Perhaps. But there are several issues:

(a)   Firms and governments are used for different purposes.
(b)   Managers and politicians are chosen differently and have different incentives.
(c)   The relationship between a firm and its workers is different from the relationship between a government and its citizens.
(d)   Governments can impose larger penalties on people than firms.
(e)   Governments can influence more aspects of someone's life than firms.
(f)   But people might care more about working conditions than government policies.

Furthermore, there can be differences in exit costs. These may be large for governments and small for firms. But exit costs are variable in both cases. National governments may have high exit costs while cities and towns may have relatively low exit costs. Likewise, in a firm where workers have highly specialized skills, the employees may have high exit costs (it would be hard to find another job with similar wages). But for a firm operating in a competitive labor market, exit costs may be almost zero because someone can walk across the street and get a job that is virtually identical and pays an identical wage.

I think the crucial analogy between governments and firms is that in both cases, there are people who have some degree of power over other people. In a political system we often solve this problem through democratic institutions, where people who abuse their power can be removed from office. In a similar way, you can argue that managers in firms may be abusive and having an LMF would give workers an opportunity to fire managers who abuse their authority.

My personal view is that you don't have to accept the analogy between governments and firms in order to believe that LMFs would tend to protect the interests of workers. Such safeguards could be good even if governments and firms differ in numerous other ways. Authority can be a dangerous thing, so giving subordinates some institutional protection against their superiors seems desirable.

2.4   Property

This section may be the hardest one in the chapter to understand. It was written mostly as a response to the views of David Ellerman. I disagree with Ellerman about various points but he has been influential in the literature on LMFs and I needed to address his ideas.

Ellerman argues that labor is inalienable, in the sense that you cannot sell your decision-making powers to anyone else, and you cannot avoid taking moral responsibility for your actions by claiming that you did. I agree with this (you will see later in Chapter 11 that I use the inalienability of labor in some important theoretical ways).

He then goes on to argue that the employment contract is fraudulent because it pretends that workers actually can sell their decision-making powers to an employer. I don't agree with this because I don't think that is what happens in an employment relationship. The employee still has the power to make decisions. By entering into a contract, she decides to do what the boss asks, as long as the pay and working conditions are acceptable. She can still decide to disobey the boss if the boss makes unreasonable or illegal requests.

Another problem is with the use of the word 'fraud'. This normally means that someone asks you to pay for something, but the thing you receive is different from the thing you were promised (like having someone sell a product that they say will cure a disease when really it doesn't). I don't think an employment contract is fraudulent in this sense because everyone understands what is going on.

I also dislike Ellerman's analogy between employment and slavery. Clearly these are not the same thing. With slavery, one person owns another person, and has the legal right to sell them or kill them. An employer doesn't 'own' an employee. It is true that employers can tell employees what to do. But employees are free to quit while slaves are not.

I make one more point in this section. Suppose we start with an LMF, which Ellerman clearly likes. Then suppose we make a series of small changes in the contracts among the people involved, and each small change seems harmless from a moral point of view. But at the end we have a KMF, which Ellerman clearly doesn't like. If the intermediate steps were harmless, then what is the basis for Ellerman's normative distinction between LMFs and KMFs?

2.5   Dignity

Does being an employee limit your sense of dignity, self-worth, or self-respect? Some people argue that this tends to happen when people are bossed around all the time and treated more like an object than a human being. So perhaps if people can participate in making decisions that affect their lives, they will have a stronger sense of self-worth.

One issue that sometimes comes up in this context is whether there should be markets for membership rights in LMFs. Some authors argue that this means people are being treated like commodities that can be bought and sold, and this undermines human dignity.

Although I believe that participating in decisions can add to one's sense of dignity, I don't think it follows that LMFs should avoid the use of membership markets. These are two different issues. A market for membership doesn't mean that anyone is buying or selling a person. It just means that if you want to join a firm, you must pay something either to the people who are already members, or to the person you are replacing. After you do this, you have the same right to participate in decision-making as everyone else.

There could be good reasons for having such a market. For example, if existing members have done a lot of saving and investing in the past, and they accumulated a valuable stock of capital, it is not clear why you should be allowed to become a member for free and get a share of the benefit from these past sacrifices by the other members. Maybe you should have to pay some compensation to them in return for the right to share in the benefits.

We will come back to the topic of membership markets later, especially in Chapter 7. I will argue that competitive membership markets can be useful in certain ways. However, in practice it may be hard to make such markets work well (for example, due to potential adverse selection problems).

2.6   Community

One argument for LMFs is that workers tend to live close to the places where they work, so they will take account of positive and negative externalities generated by the firm that affect the local area. For example, LMF members may try to avoid creating air and water

pollution, they may add to the supply of local public goods, or they may make charitable contributions to the local community.

Unfortunately, this argument is less plausible for externalities that go beyond the local area. I'm not confident that LMFs would do more than other kinds of firms to limit the emission of greenhouse gases, which lead to climate change for the entire planet.

Another common argument is that LMFs create a sense of community in the workplace. This seems likely to me because all members share in decision-making activities and the resulting decisions affect everyone in the firm. Of course, employees in a KMF may also develop a sense of community at work, but I think this may often be limited to subsets of employees who do similar work and are located at the same hierarchical level in the firm. At least in my experience, it is rare to have a strong sense of community between the top managers and frontline employees in a KMF.

2.7   The Author Shows His Cards

This section reveals more of my own opinions about normative issues. There is no need to summarize it here. You can read it for yourself and see what you think.

Econ 426W

Greg Dow

October 1, 2021

Lecture Notes on Chapter 3

Here are some remarks on chapter 3 of "Governing the Firm". I will address the question of what factors led to LMF success in the plywood and Mondragon cases, and what clues these cases might offer about why LMFs are generally rare.

The Plywood Cooperatives.

One question about the plywood coops is why they did very well during 1940-55 but had mostly disappeared by around 2000. There are several issues here.

1. The coops that formed during 1940-55 competed successfully against conventional firms for 50-60 years. The fact that they eventually declined is probably not due to poor organization or low productivity (in fact, there is some evidence that their productivity was higher than their KMF rivals). The problem was that the entire industry declined (both KMFs and LMFs) because forests were being depleted in the Pacific Northwest, logs became expensive, and environmental regulations were imposed. As a result, the plywood industry gradually moved from the northwestern US to the southeastern US.

2. During the 1940-55 period, there was a lot of entry into the industry by both KMFs and LMFs. This was initially caused by increased demand for plywood during World War II. But it didn't end after the war. During 1946-55, there was still high demand for plywood in house construction (the parents of the baby boomers were returning from the war, buying houses in the suburbs, and having kids), so entry by new firms continued.

3. Around 1956, entry by new LMFs (coops) abruptly stopped. However, entry by new KMFs continued into the 1960s and 1970s. Furthermore, existing coops continued to be successful, so it is not that something went wrong with the coops that were already in the industry. It is puzzling that no further LMFs were created after this time.

Here is my explanation. During the early 1950s, the prices of the shares in coops had been rising rapidly, so the initial members did very well financially. This encouraged outsiders (promoters) to set up new coops, sell shares to workers, make a quick buck, and then leave. The promoters did not want to work in the coops. They were just interested in the financial rewards from organizing new LMFs.

Around 1955, two coops were involved in well-publicized court cases where promoters were found guilty of fraud (lying to workers about the value of membership) and were

sentenced to long prison terms. The members of these LMFs lost money. This seems to have made workers distrust anyone else who tried to set up a coop, so no further coops were created, despite the fact that existing coops were still doing well and KMFs were continuing to enter.

Possibly this provides a more general lesson about the difficulty of creating LMFs. For an entrepreneur to make money by establishing such firms, it is necessary to sell shares or charge entry fees to potential members. But if workers don't trust the entrepreneur, they won't be willing to pay much for membership rights. Therefore, an entrepreneur who has an idea for creating a firm may find it more profitable to create a KMF instead (even if an LMF would have been more productive).

We could translate this into an economic model involving adverse selection, where some entrepreneurs have good projects and some have bad projects. An entrepreneur knows if their project is good or bad, but workers do not observe this. As long as workers believe that most projects are good, they are willing to pay a large amount for membership rights and entrepreneurs find it profitable to set up LMFs. But if something happens to change worker beliefs (such as a fraud case), and they start to believe most projects are bad, they won't be willing to pay much for membership. Thus, entrepreneurs will create KMFs.

From this perspective the plywood coops were an exceptional case: workers in the region had unusually optimistic beliefs because the market value of membership in the existing coops had been increasing rapidly. These beliefs supported the entry of new LMFs for a while, but they proved to be fragile. Perhaps the normal situation is that workers distrust entrepreneurs who claim to have good ideas (they know most entrepreneurs actually have bad ideas), so workers aren't normally willing to pay much for LMF membership. Thus, we normally get KMFs.

The Mondragon cooperatives.

There are two key questions about this case:

(a)   Why has the Mondragon group been so successful?
(b)   Why hasn't this system been copied by other people?

With regard to question (a), I think a big part of the story is the role of the CLP, which was a cooperative bank at the center of the system. The CLP had an unusual advantage due to the Spanish banking regulations in the 1950s: it could offer higher interest rates to depositors than conventional banks, so it could attract a lot of capital. It also confronted an unusual constraint: it was only permitted to lend to coops (except for the alternative of investing in bonds that paid very low interest rates).

This created a situation where the CLP accumulated large amounts of capital and directed it into financing worker cooperatives in the 1950s, 60s, and 70s, which led to a very rapid expansion of the Mondragon group.

Another factor is that the coops themselves had rules requiring that a large share of firm profit be reinvested rather than being paid out as wages. This also led to expansion.

In fact, the Mondragon group as a whole had so much capital that it started buying KMFs and converting them into LMFs, which became another source of expansion.

I find this interesting because one popular theory about why LMFs are rare is that they have trouble getting capital. We will consider this idea in more detail later (chapter 9). The success of Mondragon supports this idea by showing that when unusual conditions happened to make capital abundant, LMFs took off.

Suppose this is correct. Maybe this is part of the answer to question (b), about why the Mondragon system has not been copied. Perhaps if you want to start a system of LMFs, first you need to start a bank.

For most LMFs, this is not a practical option. And if they can't obtain loans from a more conventional bank (or would have to pay a higher interest rate than a KMF), maybe they will rarely be created or will have trouble growing.

Under normal conditions, even if groups of LMFs could somehow start a bank, the bank controlled by LMFs will rarely have a special regulatory advantage over other banks. So maybe it is not surprising that the Mondragon system has not been replicated elsewhere.

Of course, there may be other reasons why Mondragon was unique. Some people think that the history, culture, and politics of the Basque region in Spain played a role. From this point of view, it is ironic that the fascist government of General Franco created the peculiar banking regulations that allowed Mondragon to thrive. The government almost certainly did not intend for this outcome to occur.

In any event, the case studies in chapter 3 give us important clues about economic factors that might limit the formation of LMFs.

The plywood coops suggest that worker trust in the people who organize LMFs is crucial, and this trust can be fragile. KMFs don't seem to have a similar problem.

The Mondragon coops suggest that LMF formation and expansion may require unusual access to capital. This is consistent with the hypothesis that LMFs are rare because they normally face disadvantages in the capital market compared to KMFs.

I think both cases provide evidence that LMFs can be successful for long periods of time in competition with KMFs. What this suggests to me is that LMFs are probably not rare due to productivity or survival problems, but rather because they are rarely created (and KMFs are rarely converted into LMFs).

Greg Dow

October 8, 2021

Lecture Notes on Chapter 4

Here are some remarks on chapter 4 of "Governing the Firm". I will discuss a number of questions about the Lega, ESOPs, and codetermination that seem interesting, and provide my own opinions about what the answers are likely to be.

The Lega.

One interesting question about the Lega involves the role played by government benefits and constraints. Certain governments in Italy clearly wanted to encourage worker coops and provided them with tax breaks as well as favorable access to public contracts. But a number of constraints were also imposed on these firms: a limit on the percentage of the workforce in white collar jobs, a ban on transferable membership rights, limits on capital that could be invested by members, limits on the interest that could be paid to members, and a prohibition on selling bonds. Several of these constraints were eventually relaxed or eliminated.

Despite the numerous constraints on worker cooperatives in the early stages, it is hard to argue that government intervention discouraged the formation and expansion of worker coops, given that Italy clearly has the largest worker coop sector in Western Europe or North America. According to the most recent figures I have seen, this sector as a whole employs about 500,000 people (this includes other coops besides those in the Lega).

One problem is that we don't know what organizational structures the coops would have adopted in the absence of all the constraints that were imposed. Would they have chosen to use transferable membership rights? How much of their own capital would members have invested? It is true that some of these restrictions were eventually removed, but they could have played an important role in shaping the initial design of the system.

A further question is why governments imposed these constraints. If you want to create a large LMF sector, it seems counterproductive to impose so many restrictions on how such firms must behave. Maybe the government was trying to target the benefits in some way (e.g. to blue collar rather than white collar workers)? Maybe it was trying to avoid giving subsidies to KMFs that were only pretending to be LMFs? The answers are not clear.

Putting these issues to one side, there is the question about whether these LMFs have any productivity advantage or disadvantage relative to similar KMFs. Some economists who have studied the issue say that the Lega coops did have higher productivity, while others

don't find any significant difference (one study found a slight disadvantage for the coops but only for blue collar workers). If the coops do have a productivity advantage, it does not appear to be showing up in wages, which are approximately the same as in similar KMFs. However, this doesn't rule out the possibility that members of LMFs could be getting such benefits through the profits paid into their individual capital accounts.

It would be nice to know whether the benefits of creating a large LMF sector exceeded the costs of the government expenditures that were used for this purpose. However, it would be very difficult to do any systematic cost-benefit analysis of this kind. For one thing, we would need reliable productivity comparisons between the two kinds of firms. For another thing, we would need some way of valuing the non-economic benefits from worker coops (more democracy, more equal wages, perhaps better working conditions).

At a general level, it seems clear that both the Lega and Mondragon have solved certain problems that often face LMFs. In both cases, these systems have organized new LMFs, converted failing KMFs into LMFs, grown in scale over time, and diversified into a range of different industries or sectors. Both systems have financial institutions like banks, insurance companies, and pension plans that support individual worker cooperatives.

What this suggests to me is that it is hard to create isolated LMFs from scratch. However, a strategy involving groups or federations of cooperatives, a central source of capital, and growth through conversion of KMFs into LMFs can succeed under some conditions.

Employee Stock Ownership Plans (ESOPs).

According to the most recent numbers I have seen, about 14 million U.S. workers have some degree of share ownership in their firms. In most cases, the workforce as a whole owns a minority share. But about 2 million workers are in firms where the employees as a group own a majority of the shares.

Here are several questions about ESOPs that I find interesting.

1.   Are firms with ESOPs necessarily also LMFs? Could they be?

The answer to the first question is no. The presence of an ESOP does not imply that a firm is an LMF, for several reasons: (a) workers often own less than 50% of the firm's shares and thus have less than 50% of the votes; (b) votes are usually proportional to the supply of capital rather than the supply of labor; (c) workers rarely get seats on the board of directors; and (d) in closely held firms (those not listed on any public stock exchange) workers typically have weaker voting rights than other shareholders.

The answer to the second question is yes, it is legally possible to use an ESOP to create an LMF. In a few cases, ESOPs have been used to transform existing KMFs into LMFs by having the ESOP buy up 100% of the shares and make decisions based on the rule of one person, one vote (rather than how many shares are owned by each individual).

2.	Why do firms create ESOPs?

(a)	There is a tax advantage. For a normal firm without an ESOP, dividend income is subject to what is called 'double taxation'. First the profit of the firm is subject to a corporate income tax. Then when the firm pays out its after-tax profit to share owners as dividends, the individual shareholders include the dividends as part of their income and pay an individual income tax. But with an ESOP, any money the firm contributes to the ESOP is treated as a cost of labor compensation (like wages) rather than as part of the firm's profit, so it is not subject to the corporate profit tax. Depending on the tax rate the firm must pay on profit, this could lead to a sizeable subsidy for firms that use an ESOP as a source of capital.

(b)	Suppose the top managers of a firm are worried about a hostile takeover, where an outsider may buy up 51% of the shares, replace the board of directors, and fire the managers. By locking up a large fraction of the firm's shares in an ESOP they can make this more difficult and increase their own job security.

(c)	Some research indicates that firms with ESOPs are less likely to become bankrupt (although the reasons are a bit unclear; see the discussion of productivity below).

(d)	If an entrepreneur has been running a firm for a long time and wants to retire, s/he will probably look for a way to sell off the firm. If no children are interested and it is too much trouble to list the firm on a public stock exchange, an ESOP can be used to solve the problem. The entrepreneur can sell off 100% of his/her shares to the ESOP and then let the employees manage the firm. This is one way in which ESOPs have been used to create genuine LMFs. (Another way is when a KMF is in danger of financial failure and a labor union uses an ESOP to buy the firm as a way of saving jobs.)

Given these advantages, why doesn't every firm in the U.S. create an ESOP, even if there is no productivity gain from doing so? A number of issues arise. First, if employees will be the ones who have to pay for the shares owned by the ESOP, they have to consider the tradeoff between consumption versus saving. Second, employees may be risk averse and prefer to hold wealth in a more diversified way. Third, employees may be worried about moral hazard issues where managers or existing shareholders could lie about the value of the firm, cook the books, steal the employees' pension funds, and so on. There are likely to be problems of asymmetric information, especially if workers have no representatives on the board of directors.

3.	Who pays for the after-subsidy cost of an ESOP?

Suppose that due to the elimination of double taxation, for each dollar's worth of shares the firm contributes to an ESOP, the federal government pays 30 cents. We still have a question about who is paying for the other 70 cents. I think it is unlikely to be existing shareholders. In general the top managers who would be making the decision about an

ESOP are chosen directly or indirectly by the current shareholders, and will probably not create an ESOP if this makes the shareholders worse off. Also, empirical research shows that the share price of a firm usually goes up when a new ESOP plan is announced, which suggests that shareholders usually believe an ESOP will make them better off.

Another possibility is that the employees could indirectly pay for the ESOP by receiving lower wages, or less wage growth than they would have had, or through the elimination of other retirement plans, etc. However, empirical research tends to show that wages and salaries do not decrease when ESOPs are created (the value of the ESOP shares is 'gravy' on top of whatever wages and benefits the employees were previously getting). The main evidence for this is that such programs tend to diminish worker turnover, which suggests that the program is making jobs more desirable. Notice that if workers are risk averse, it may be necessary to offer them more average income in order to compensate for the extra risk they are bearing through the ESOP. But the evidence for lower labor turnover seems to show that workers are getting more than enough compensation for the risk involved.

A third possibility is that the ESOP increases productivity, and the productivity gains are used to pay for the value of the shares given to workers. In this scenario, both employees and shareholders can become better off (in addition to sharing the tax subsidy from the government, they can share the productivity gains).

4.   Are there productivity benefits from an ESOP?

A lot of economists have tried to determine whether creating an ESOP leads to increased productivity for the firm. Some people find a significant positive effect and some people don't (but no one finds a significant negative effect).

The current consensus is that a necessary condition for an ESOP to raise productivity is that employees must simultaneously have greater participation in decision-making. The idea is that financial participation and decision-making participation are complements: if you want higher productivity, you need to provide both. The causal mechanisms likely involve greater information sharing between workers and managers, stronger incentives for workers, and a more cooperative organizational culture.

The research I have seen suggests that firms establishing ESOPs while also introducing greater worker participation in decision-making do tend to get small productivity gains, something like 5%. However, the firms that are most likely to have productivity gains from ESOPs are also the ones most likely to create ESOPs. Firms that would not have much productivity benefit are probably choosing not to create ESOPs. So requiring a firm to establish an ESOP would not necessarily enhance productivity in that firm.

Codetermination.

There is a puzzle about the establishment of codetermination in Germany. There was a great deal of opposition to it before 1976, especially from managers. But after the 1976

law was implemented, it was very hard to find any significant effect of codetermination on share prices or other firm variables. The absence of any effect on share prices seems to show that capital suppliers did not experience any negative consequences. Today, my impression is that this is no longer a big issue in Germany. Shareholders and managers are not actively trying to eliminate codetermination, and appear to accept it as a routine feature of their system of corporate governance.

How can we explain this? There are two main possibilities. One is that codetermination did have major effects but they were difficult to detect. The other is that codetermination had much less effect than the opponents expected. I lean more toward the latter view for the following reasons.

In almost all cases, the labor representatives are a permanent minority on the supervisory board because capital representatives have a tie-breaking vote. The only situation where employee board seats would actually matter is some issue where the capital suppliers are split while the labor suppliers are not. This is probably a rare event.

Furthermore, the supervisory board may not do much. Most important decisions seem to be delegated to the managerial board, or to the managers themselves. Probably managers were able to evade codetermination in situations where it would have had large negative effects for the managers. Possible strategies included keeping the number of employees below the level where codetermination would have to be used, splitting one big firm into two or more smaller firms, shifting certain types of decisions from the supervisory board to the managerial board, and so on.

Today managers no longer oppose the system because it doesn't matter. The main value of codetermination seems to be in providing workers with credible information about the financial condition of the firm. This could be useful to managers in some situations (for example, convincing workers that wage restraint or job losses are necessary because the firm is going through a rough patch). Codetermination might also have some symbolic value in convincing the employees and shareholders that they are all on the same team.

Going back to the productivity issue with ESOPs: some people make a similar argument that codetermination raises productivity in firms. If this is true, it could have turned out to be a Pareto improvement, where employees got increased bargaining power but at the same time the size of the total pie got bigger, so capital suppliers were no worse off (the managers thought they would lose out, but they were wrong). I'm not aware of any good evidence for productivity increases from codetermination. I think the more likely result was a zero or small productivity effect and a zero change in relative bargaining power.

Some researchers in economics and finance have tried to develop theoretical predictions about the effects of codetermination on firm behavior. These ideas are discussed on p. 89 of the textbook. I will not take the time to explain these predictions here because there is no empirical evidence that any of the hypotheses are correct. The main lesson is that you can have a theory that makes predictions, but the predictions can turn out to be wrong. If this happens, maybe you should forget about that theory and look for another one.

Econ 426W

Advice for Revising Papers

Greg Dow   October 15, 2021

These notes are intended to supplement the comments I made on individual papers. The advice here is relevant for everyone so I wanted to distribute it to the entire class.

1.   Organization

(a)   Have a title page. This should include the topic of the paper, the course number, your name and student ID number, the date, and the nature of the assignment (for example, the final draft of the first paper). These are the basics, but you can add other information if you feel it would be useful. The title page is not included in the 5-page limit for the paper.

(b)   Have a reference page. This comes at the end and is separate from the main text. It should include a complete citation to each source you mentioned in the text of your paper. If you aren't sure about the appropriate format for a citation, you can use the references at the end of the textbook as a model. Because I do not expect any additional research, in most cases the reference page will just have a citation to the journal article you are writing about. The reference page is not included in the 5-page limit.

(c)   When citing an article or book in the text of a paper, economists use the names of the authors followed immediately by the date of publication in parentheses: for example, Burdin and Dean (2012). When there are three or more authors, such as John Pencavel, Luigi Pistaferri, and Fabinao Schivardi, you can abbreviate this in the text as Pencavel et al. (2006). However, you need to write out all three of the names on your reference page.

(d)   You don't need to repeatedly cite the authors and the date in the text of your paper as long as the source of the ideas is obvious. It is fine to say "the authors believe X" or "according to the writers, Y is true because Z is true". Be careful about the use of singulars and plurals. If there is only one author, say "the author". If there are two or more authors, say "the authors".

(e)   If you need to use a direct quote from the authors, then give a citation and include a page number so the reader can easily find the quote in the original article.

(f)   Try not to overuse direct quotes. It is usually best to express the author's ideas in your own words. A direct quote is valuable only if it is important for the reader to know exactly how the author said something (for instance, maybe the author said something ambiguous and you are identifying possible alternative interpretations).

(g)   You don't need formal citations to the sources cited by the author of the article. For example, if the author is doing a literature review and cites previous work by Williamson, Hansmann, and other writers, you can just mention the names of the earlier people and say why the author thinks their ideas are important. In cases of this sort, it is unnecessary to include full citations to Williamson or Hansmann. If a reader really cares, they can find the journal article you are discussing and track down the references provided in that article.

(h)   Use page numbers. This helps readers see how long your paper is, and also helps a reader to find things you said on earlier pages. It is especially helpful when the reader wants to discuss your work (for example, someone might want to say "you claim that X is true on p. 3, but really I think Y is true instead).

2.   <u>Style</u>

(a)   Use paragraph breaks! You should start a new paragraph whenever you introduce a new topic. This conveys the logical structure of your argument to the reader in a convenient visual way. It is very hard to follow an argument in a paper that does not use paragraphing. The reader will often have trouble understanding where the paper is going or what point the writer is trying to make. You will probably find that forcing yourself to think systematically about where to put paragraph breaks will clarify your thinking about the appropriate sequence of ideas for your paper.

(b)   There is no fixed rule about how long a paragraph should be (it depends on the subject matter) but normal writing often has about 3-5 sentences per paragraph and 3-4 paragraphs per page. Indent the first line of each paragraph so the reader can easily scan down the page and see when you are moving to a new topic. You don't need any extra line spacing between paragraphs. I often use the symbol ¶ to indicate places where I think it might make sense to start a new paragraph.

(c)   Use short simple sentences. One idea per sentence is good where possible. It is sometimes necessary to include two ideas in the same sentence in order to explain how the ideas are related. But complex sentences containing three or four ideas are hard to follow and frequently confuse readers. Avoid prolonging a sentence unnecessarily through the use of commas, colons, semi-colons, dashes, and other punctuation marks. If you are writing this way, it is usually a sign that you should break a sentence down into 2 or 3 shorter sentences. As with paragraphs, there is no fixed rule about the length of a sentence, but if a sentence requires 4 or 5 lines it is probably too long.

(d)   Have a clear opening paragraph that says what your paper is about. This should usually include the name(s) of the author(s) and the date the article was published. The opening paragraph should be no more than 4-5 sentences and should not have any quotes or technical jargon. It should also not include any details about theory, data, methods, etc. You can postpone discussions of those things until later. The

goal of the opening paragraph is to say what the subject is, and why the subject is interesting or important.

(e)   After introducing the paper in the first one or two paragraphs, it is often helpful to give the reader a brief road map describing what you intend to do in the rest of the paper. This is not always necessary but it is useful if there will be several steps in your argument and you want the reader to know where you are going.

(f)   Throughout your paper try to avoid making vague, general, or obvious statements. Instead, be specific, concrete, detailed, and precise. Make each of your sentences as informative as possible. Also, avoid excessive repetition. This takes up space that could have been used to convey additional information, and it tends to make the reader impatient.

(g)   Use words efficiently. Don't use ten words to say something if five words can be used to say the same thing. Look for words or phrases that don't add anything to the substance of your sentences and delete them.

(h)   Include a serious evaluation of the article at the end of your paper (about one full page). Don't just heap praise on the author, and don't make superficial criticisms. Every article has multiple strengths and weaknesses, so you should try to provide a balanced assessment and justify your opinions in some depth.

3.   Economics

(a)   You should go beyond simply reporting statements made by the author. Try to explain the author's reasoning. Why does the author think the statement is true?

(b)   Remember to explain concepts or acronyms that would not be familiar to a reader who has not taken Econ 426. This includes LMF and KMF. It might also include terms like asset specificity, cluster analysis, capital asset pricing model, and so on. For terms of this kind, give a brief definition or explanation before moving on.

(c)   Most of your paper should be verbal, but sometimes it is easier to explain ideas to the reader if you use one or two equations. In this case, be sure to define all of the symbols so the reader knows what they mean. Explain where the equation comes from, why it is true, and why it is important.

(d)   If there is a theoretical model (which could be either verbal or mathematical), you should discuss the following things.

    (i)   Assumptions: depending on the model, this might involve assumptions about demand, utility functions, production functions, cost curves, firm behavior, market structure, informational asymmetries, and so on.

(ii) Economic reasoning: what are the logical steps in the argument? What are the cause and effect relationships among the variables? How is the author using the assumptions to reach the conclusions?

(iii) Conclusions: what are the key results obtained from the model? Why do the results make sense and why does the author think they are important?

(e) If there is empirical research, you will need a detailed description of the data set, the statistical methods, and the main findings.

(i) Data: provide details about the country, the time period, the source of the data, how key variables were defined and measured, the sample size, and similar information.

(ii) Statistical methods: does the author test for differences in means? Or use regression methods? Or some other technique? If regression is used, what is the dependent variable, what are the independent variables (including the control variables), and what hypotheses are being tested? Were there specific problems the authors faced, and how did they try to solve them?

(iii) Findings: which coefficients were positive, negative, or insignificantly different from zero? Were the effects quantitatively large or small? What were the levels of statistical significance? Were the results consistent with the author's expectations? Why or why not?

(f) Organize your paper so that related ideas are grouped together. Don't jump back and forth between theory, data, literature reviews, and so on.

(g) Put sections into a logical sequence. For example, after your opening paragraphs it might make sense to start with the author's general theoretical framework, then describe the hypotheses to be tested, then the data set, then the statistical methods, and then the main findings or results. Another option is to follow the organization of the journal article itself, and describe it section by section. I am flexible about the organization as long as you carry out the tasks described in the assignment.

4. Grading

I will grade the final versions based on whether I think a typical economics major who has not taken Econ 426 would gain a clear understanding of what the author accomplished in the article.

So above all else, strive for clarity in the way you provide information to a fellow student. This goal should determine how you organize the paper, how you write, and how you explain economic ideas.

Econ 426W

Greg Dow

October 15, 2021

Lecture Notes on Chapter 5

Here are some remarks on chapter 5 of "Governing the Firm". I will focus on differences between firms and markets, and the issue of why firms exist at all.

The idea that a firm is defined by authority relationships is an old one, going back at least to a famous article by Ronald Coase (1937) called "The Nature of the Firm" (for the full citation, see the reference list at the end of the textbook).

Coase was the founder of transaction cost economics. He said that authority will be used to organize transactions when this is cheaper than using markets. Otherwise markets will be used. Oliver Williamson developed this idea further in the 1970s and 1980s.

By the way, Coase won a Nobel Prize in 1991, partly for his 1937 article about the firm, and Oliver Williamson shared a Nobel Prize in 2009 with Elinor Ostrom.

To see how firms might arise, it is helpful to consider a thought experiment: why can't we use the market to do everything that a firm does?

In particular, suppose that for every production task we had

1.   Many competing bidders
2.   People signing legally enforceable contracts
3.   Everything being coordinated by a person who signs contracts with everyone else.

If this is possible, we don't need authority relationships to manage production. In a sense, every individual person would be a separate firm.

Could this work? Why doesn't this happen?

1.   The assumption of many competing bidders might not be true if people develop
        specialized skills that are useful for a particular production process, or there are
        machines that are more useful for one particular production process than for other
        purposes. In such situations, suppliers of inputs may have some monopoly power
        and we would have bargaining relationships rather than competitive markets.

2.   The assumption of legally enforceable contracts runs into trouble when there is
        asymmetric information. This comes in two forms.

(a)   *Adverse selection*: before a contract is signed, some of the parties involved may have private information about their own characteristics that is not available to the other parties (such as their own skills or the quality of the physical assets they are contributing). Assume these things are not easily observed. If you discover after signing the contract that you got a low-skill person or an unreliable machine, what do you do? It could be difficult or expensive to prove in a court that you got stuck with a bad type. There may be solutions involving signaling or reputation, but in some cases these solutions could be costly or might not work very well.

(b)   *Moral hazard*: after a contract is signed, one party may be able to take private actions (such as their choice of effort) that are hard for others to observe. It is often costly to monitor people, and even if you do, how will you punish people who contribute less than they promised? If you fire them, they may walk across the street and get the same wage doing a similar job. In general there would have to be some costs for shirkers, such as a period of search before finding a new job, or a lower wage at the next job, or having to invest in new skills before getting a new job. Again, reputation might not be an adequate safeguard; this depends on how much information is transmitted to other market participants.

3.   The assumption that everything can be coordinated through contracts runs into another problem, which is that contracts are often incomplete. It can be difficult to spell out everything that needs to be done in a comprehensive contract. This is especially true when desired actions can change over time, or depend upon some future state of the world that is currently unknown. Trying to write down what everyone should do in every possible future situation is likely to be challenging.

For reasons of this kind, coordination by means of contracts could be expensive while coordination by means of authority could be cheap. In the latter case, we can wait until the future arrives. Then the boss can observe the new situation and tell people what needs to be done. This might be a lot easier than trying to set up one big contract in advance.

You might say: why not just wait to see what the state of the world is, and sign contracts then, rather than trying to do it in advance? This brings us back to the earlier point that over time people frequently develop specialized skills or other specialized assets. For this reason, even if initially we have perfect competition, over time competitive bidding tends to go away and is replaced by some form of bargaining. So realistically we need to choose between authority and bargaining. If bargaining is costly enough, authority may be used instead.

Why doesn't bargaining always lead to efficient results? It could be costly or impossible to negotiate short-term contracts whenever something must be done. These costs include the opportunity cost of time, the cost of hiring lawyers, and bargaining problems linked to informational asymmetries (I may have private information about what I am willing to pay and you may have private information about what you are willing to accept). There is also a problem that some bargaining games have multiple equilibria.

All of these problems generally get worse when bargaining involves groups with many individual members. Try to imagine bargaining among members of a large group over who does the bad jobs, who does the good jobs, and how income should be distributed among the participants.

Under these conditions, authority could be a cheaper and faster way to make decisions. Instead of bargaining constantly about the distribution of income, we leave the wage for each person where it is. People do what they are asked to do if it is within their "zone of acceptance", meaning that they prefer to comply with requests rather than quit their job.

What are the problems with authority? The most obvious one is that it can be abused. Why would a manager with authority over subordinates pay attention to what is good for the subordinates, or for the firm as a whole? Why wouldn't the manager behave in self-interested ways instead? For example, managers could ask for personal favors that have little or nothing to do with the productivity of the firm.

In general, higher exit costs tend to imply a wider zone of acceptance for employees. This implies more flexibility for managers, and more temptation to abuse authority.

Here are some possible restraints on the abuse of authority within a firm.

1. *Competition*. If managers are abusing employees at the expense of productivity for the firm as a whole, the firm may compete less effectively against rival firms.

2. *Reputation*. If a firm abuses people, and this becomes widely known, it may be hard to recruit future employees, investors, customers, etc.

3. *Retaliation*. People who are abused by their boss can engage in shirking, quitting, sabotage, or organize a strike.

4. *Higher authority*. Maybe if the boss is abusive, the boss's boss will do something about it. But then who deals with abuses by the ultimate control group?

5. *Democracy*. In an LMF, there is a feedback loop: managers can potentially abuse workers, but if they do, the workers can potentially get rid of the manager.

None of these restraints on authority is perfect, but each may provide some protection to subordinates.

Econ 426W

Greg Dow

October 22, 2021

Lecture Notes on Chapter 6

Here are some remarks on chapter 6 of "Governing the Firm".

The purpose of this chapter is to survey a range of theoretical frameworks that could be used (or have been used) to explain why LMFs are rare. We will discuss more specific hypotheses in chapters 7-10.

I will start off with a few observations about what a good theory needs to do.

1.   We need to think about situations where markets are imperfect, for two reasons. First, as we learned in chapter 5, if there were complete contracts and perfectly competitive markets, there would be no need for authority and thus no need for firms. Production activities could be organized entirely through markets.

        Second, even if we did have firms, it can be shown mathematically that it would make no difference whether we had KMFs or LMFs. Assuming that KMFs have competitive stock markets and LMFs have competitive membership markets, both types of firm will maximize profit, so their behavior is identical. Such results are sometimes called 'equivalence theorems'. We will come back to this in chapter 7.

2.   We need to think about differences in the characteristics of capital and labor. If there were no differences between K and L, then even with market imperfections, the imperfections would affect KMF and LMF behavior in parallel ways. Thus it would be impossible to explain the asymmetries between KMFs and LMFs in the real world, such as the fact that KMFs are more common than LMFs. This is the basis for what I call the 'symmetry principle' (see section 6.1).

3.   We have to be careful with our assumptions regarding the design and behavior of KMFs and LMFs. For example, a good theory should not just assume that LMFs must pay every worker the same amount. Imposing a constraint like this on the LMF might 'explain' why LMFs are rare, but it is not obvious why LMFs would face such a constraint while KMFs would not. This is the 'replication principle': a good theory has to trace differences between KMFs and LMFs back to underlying differences in the nature of K and L, not just some arbitrary difference in how the two firms are defined (see section 6.2).

The rest of chapter 6 is organized according to how much each theoretical framework relies on the assumption of economic efficiency.

Transaction cost economics (TCE) and optimal contracting (principal-agent) models both make strong assumptions about the efficiency of firms. Each recognizes the existence of information constraints, incentive constraints, and incomplete contracts. However, each assumes that subject to these constraints, the organizational structures we observe in the real world are efficient. If you wanted to explain the rarity of LMFs using a framework of this kind, you would have to say that KMFs normally have better efficiency properties than LMFs, but in a few situations (the ones where we actually observe LMFs), it just so happens that LMFs have better efficiency properties than KMFs.

Economists who think about firms using TCE consider different 'governance structures', which are simply different ways of organizing transactions. For example, having capital suppliers control the firm is one governance structure, and having labor suppliers control the firm is another governance structure. The theory predicts that governance structures arising in the real world will be the ones that minimize 'transaction costs', which (roughly speaking) are the costs of planning, monitoring, and enforcing transactions.

Section 6.3 discusses the arguments of two economists who have applied TCE to issues involving LMFs: Oliver Williamson and Henry Hansmann. You can read the details in the book, but a simplified summary is that (a) Williamson argues that LMFs have high transaction costs due to incentive problems, while (b) Hansmann argues that LMFs have high transaction costs due to difficulties workers face when making collective decisions.

Section 6.4 discusses optimal contracting. If you are familiar with principal-agent theory, or you have seen models involving moral hazard, these ideas should be familiar. Suppose an agent (employee) supplies effort, which is not observed by the principal (employer). The principal wants to design a contract linking the agent's income to output, which can be observed. The problem is that output is influenced not just by the agent's effort, but also by a random variable the agent cannot control. Usually in such models we assume the agent is risk averse and the principal is risk neutral, and that the principal maximizes her own expected utility subject to a constraint on the minimum expected utility received by the agent. This means that the contract is Pareto efficient, subject to the information constraint.

It is probably not obvious what all this implies about LMFs. However, if we wanted to use this framework to explain why LMFs are rare, we would need to argue that for some reason, LMFs are less able to solve the effort incentive problem than KMFs. We'll come back to this issue in chapter 8.

The next two theoretical frameworks, adverse selection and repeated games, do not rely on any efficiency assumptions, although they do assume that individuals are rational in the usual economic sense (they maximize utility or payoffs).

Most of you are probably already familiar with adverse selection. The classic example is the market for used cars, but similar problems routinely emerge in markets for capital and labor. Another major example is the insurance market. In all of these cases, the people

on one side of the market have characteristics that they know about, but which cannot be observed by people on the other side of the market. These characteristics are permanent (unlike effort in a moral hazard problem, which is a choice), and are privately known by people on the informed side of the market before any contracts are signed. For example, in the labor market the characteristic may be the worker's true ability, while in the capital market the characteristic may be the true risk that a borrower will not repay a loan.

As explained in section 6.5, adverse selection can lead to bad equilibria where only the low-quality people remain in the market while the high-quality people drop out. There can be more than one equilibrium and sometimes it is possible to rank these equilibria in terms of Pareto efficiency from worst to best. If you wanted to use adverse selection to explain why LMFs are rare, one approach could be to argue that workers need to obtain capital from outside investors, but there are adverse selection problems in the capital market so it is hard to finance an LMF. On the other hand, wealthy investors can use their own funds to finance a KMF so they don't face any adverse selection problem.

Most of you are probably also familiar with repeated games. The usual example is the repeated prisoner's dilemma, but various other kinds of games could also be repeated. One way to think about repeated games is that they are an extreme version of incomplete contracts, in which there is no legal enforcement at all. Everything must be self-enforced through the strategies used by the players themselves. It can be shown that when people put enough weight on future payoffs relative to present payoffs, almost any combination of strategies from the one-shot game can be an equiibrium outcome in the repeated game. In particular, there can be bad equilibria where everyone has a low payoff, and also good equilibria that are Pareto efficient.

Section 6.6 discusses a few implications for LMFs. For example, some conclusions that economists have drawn from principal-agent models turn out not to be valid when all of the input contributions and payments from one individual to another have to be enforced through repeated game mechanisms. In fact, under some conditions it can be shown that any effort equilibrium for an economy with KMFs is also an equilibrium for an economy with LMFs and vice versa, so we get a kind of 'equivalence theorem'. More generally, if we think about the behavior of capital and labor suppliers as arising in a repeated game, there is no particular reason to assume that the resulting equilibrium is Pareto efficient.

Historical and cultural explanations move even further away from efficiency ideas. A number of authors have argued that KMFs arose primarily for historical reasons (maybe wealthy people preferred this type of firm during the Industrial Revolution), and that we continue to have KMFs today largely for political, legal, institutional, or other reasons, not because KMFs are economically desirable (see section 6.7).

If you want to use historical or 'path dependence' arguments to explain why LMFs are rare, it is important to be clear about the cause-and-effect relationships. Normally what people have in mind is some kind of feedback loop where the dominance of KMFs in the past led to the creation of institutions that are well adapted to KMFs and make it hard to create LMFs today. But if LMFs had been dominant in the past then we would have had

some other institutions that were well adapted to LMFs and these institutions would have made it hard to create KMFs. Different authors tell different stories about the details, but the general claim is that the outcome was arbitrary and it could have been different.

Section 6.8 discusses the possible connection between firm organization and culture. It is easy to find examples where LMFs (or groups of LMFs) have had members who shared a common religion, ethnicity, or ideology. It is also possible to find examples where LMFs appear to have arisen partly due to local traditions or a supportive government. My view is that such factors are occasionally important, but I don't think economists have much to say about them. However, these observations do suggest that LMFs are not a completely dysfunctional type of organization; they can sometimes succeed, and a favorable cultural environment may make the difference.

Even if LMFs are sometimes created for cultural reasons that economists may be unable to explain, economists can still have important things to say about the conditions under which LMFs are likely to survive and grow, especially when they have to compete with KMFs. Economists can also have important things to say about conditions under which LMFs are converted into KMFs or vice versa. So even if history and culture do matter, economic logic and evidence may also matter.

One note here: I mentioned earlier that chapter 6 is organized in a sequence running from approaches where efficiency plays a central role (transaction cost economics and optimal contracting) to theories where equilibrium may not be efficient but people still maximize utility functions (adverse selection and repeated games) to theories where economic ideas sometimes play little or no role (history and culture).

If you wanted to justify public policies to encourage LMFs by arguing that LMFs are rare due to market failures, and that fixing such market failures would lead to efficiency gains, it would be easiest to make such arguments using theories based on adverse selection or repeated games. These are the cases where market equilibrium might be inefficient, and where economic theory could be useful in designing policies to correct market failures.

In section 6.9 I discuss the strategy to be followed in the rest of the book. I will consider a wide variety of economic hypotheses about the rarity of LMFs in chapters 7-10. These chapters evaluate hypotheses based on which make the most theoretical sense and which have the most empirical support. I will argue that some of the hypotheses are promising, while others are probably just wrong. As we go through these chapters, theoretical ideas from chapter 6 will re-appear from time to time (transaction costs, moral hazard, adverse selection, repeated games, and so on).

Ideally what we would like to do is construct a theory that not only explains why LMFs are rare, but also explains various other asymmetries between KMFs and LMFs: which industries they inhabit, how they behave in response to demand or cost shocks, possible differences in productivity or survival rates, etc. This is a big task and we will see how far we can get with it.

Econ 426W

Greg Dow

October 29, 2021

Lecture Notes on Chapter 7

In these notes I will use math and graphs to explain how the Illyrian model differs from profit maximization, and what happens when an LMF has a membership market.

You should be able to understand the arguments here as long as you have had a course in intermediate micro theory and know basic calculus. I won't expect you to memorize the math or reproduce it on the final exam. But the math should help show how the Illyrian model differs from the usual profit-maximizing model.

Throughout these notes I consistently make the following assumptions:

1.   The firm is operating in the short run. Labor is a variable input and capital is a fixed input.

2.   The firm is a price taker in the market for its output. The output price is p.

3.   The firm is also a price taker in the labor market. The wage is w.

4.   There is a production function Q(L) where Q is output and L is labor input. This function has diminishing returns, so as L increases, the marginal product of labor decreases. See Figure 1.

5.   Capital is also an input in the production function, but because it is fixed I will not write it down explicitly.

6.   There is a fixed cost F > 0 corresponding to the firm's fixed input of capital. This does not depend on the labor input L.

THE PROFIT-MAXIMIZING FIRM

Let's start with the usual theory of the firm found in a standard micro theory course.

Profit is

(1) $\pi(L) = pQ(L) - wL - F$

The behavioral assumption is that the firm chooses labor L to maximize profit $\pi(L)$.

The first order condition (FOC) for this problem is

(2) $\pi'(L) = pQ'(L) - w = 0$

Interpretation: $Q'(L)$ is the marginal product of labor, so (2) says that the value of labor's marginal product $pQ'(L)$ must be equal to the wage w. For any given values of p and w, the labor input L must be chosen so that this equation holds.

Notice that the fixed cost F drops out when we differentiate profit with respect to labor. Therefore the fixed cost has no effect on firm behavior.

For completeness, we should check the second order condition (SOC) for profit max:

(3) $\pi''(L) = pQ''(L) < 0$

This is true due to the earlier assumption that labor has diminishing returns, so $Q''(L) < 0$ as shown in Figure 1.

If we knew the algebraic form of the production function $Q(L)$, we might be able to solve equation (2) explicitly for the firm's optimal labor input $L(p, w)$, which depends on both the price of output and the price of labor.

However, even if we don't know any details about the production function, we can obtain some insight into firm behavior using graphical methods.

Figure 2 has labor input L on the horizontal axis and shows how the value of the marginal product $pQ'(L)$ decreases as L increases (due to diminishing returns again). For a given level of the wage w on the vertical axis, we read over to the marginal product curve and then down to find the firm's optimal labor input.

For example, the wage w_0 causes the firm to hire L_0 workers, and w_1 causes the firm to hire L_1 workers. It should be clear that there is an inverse relationship between the wage and the firm's demand for labor. Thus we have a downward sloping labor demand curve.

If we increase the output price p, then the entire $pQ'(L)$ curve shifts to the right (see the dashed curve). This means that the firm hires more labor at a given wage. For instance, when the wage is held constant at w_1 while p increases, the firm goes from L_1 to L_2.

This implies that for a fixed wage w, when output price p goes up, the firm's labor input L also goes up. Due to the production function $Q(L)$, more labor means more output, so an increase in p leads to an increase in Q.

This should not be surprising. It just implies that the firm has an upward sloping supply curve (see Figure 3). This is a familiar idea in microeconomic theory.

There is a fancier way to show mathematically that the firm's output supply curve slopes up. Use the notation $L(p)$ to indicate the firm's optimal choice of L as a function of p (it also depends on w, but I will keep w fixed and not write L explicitly as a function of w).

We know that $L(p)$ must satisfy the first order condition in (2). Thus

(4) $$pQ'[L(p)] \equiv w$$

I use three bars here instead of the usual equals sign with two bars to indicate that this is an identity (it holds for all possible values of p).

Now differentiate with respect to p on both sides. On the left side you need to use the product rule and the chain rule. The derivative on the right side is zero because w is a constant. This gives

(5) $$Q'[L(p)] + pQ''[L(p)]L'(p) = 0$$

Rearranging this result gives

(6) $$L'(p) = -Q'/pQ'' > 0$$

where the positive sign follows from the fact that the marginal product Q' is positive and the second derivative Q'' is negative due to the second order condition in equation (3).

We have now shown that if output price p goes up, the firm's labor input $L(p)$ goes up.

The firm's output is $Q[L(p)]$. This is obtained by plugging the optimal labor input $L(p)$ into the production function. To see how output changes when p changes, differentiate this expression with respect to p. The result is

(7) $$Q'[L(p)]L'(p) > 0$$

This is positive because the marginal product Q' is positive and we just proved that $L'(p)$ is positive. So the firm must have an upward sloping supply curve as shown in Figure 3.

THE ILLYRIAN FIRM

The Illyrian firm does not maximize profit. Instead it maximizes the dividend, which is

(8) $$y(L) = [pQ(L) - F]/L$$

The dividend is equal to net income (revenue minus fixed cost) per worker. There is no wage here (the model ignores the outside labor market and the wage w).

This is slightly different from the Illyrian model in chapter 7, where I set F equal to zero so that the firm maximized $pQ(L)/L$. The graph on p. 145 shows AP first rising and then falling, which is not consistent with the assumption here that $Q'' < 0$. Including a positive fixed cost $F > 0$ takes care of this problem. I continue to assume $Q'' < 0$ in what follows.

Before going further, I want to emphasize that this is just a hypothesis some economists suggested about how an LMF might behave. I do not believe this hypothesis is correct. There are strong theoretical, institutional, and empirical arguments against it. I will talk more about these problems later. But for the moment, let's see what it implies.

As usual, if we want to maximize a function we take a derivative and set it equal to zero. It is convenient to rewrite the dividend as $y(L) = [pQ(L) - F]L^{-1}$. Now differentiate with respect to L using the product rule. This gives the first order condition

(9) $$y'(L) = pQ'(L)/L - [pQ(L) - F]/L^2 = 0$$

Multiplying through by L and using the definition of y(L), the FOC reduces to

(10) $$pQ'(L) = y(L)$$

This looks a lot like the FOC from (2) for the profit-maximizing firm, except here we are setting the value of the marginal product $pQ'(L)$ equal to the dividend $y(L)$ rather than the external wage w.

You might think this would lead to similar predictions about firm behavior. But the two models are not the same because the dividend y depends on the firm's choice of L while the wage w does not. To put it another way, y is endogenous while w is exogenous.

Furthermore, F enters into the definition of y(L) so fixed costs can affect firm behavior. This differs from the case where F dropped out of the FOC for profit maximization.

I won't bother with the second order condition for the Illyrian firm but it can be shown that it is satisfied under the same assumptions as for the case with profit maximization.

The question I want to explore here is what happens when the output price p goes up.

I'll use the same mathematical trick as before: define L(p) to be the Illyrian firm's optimal labor input as a function of the output price. This must satisfy the FOC so we obtain the following equation from (9) and (10):

(11) $\qquad pQ'[L(p)] \equiv \{pQ[L(p)] - F\}/L(p)$

We want to know the sign of the derivative $L'(p)$ in order to find out whether L goes up or down when p goes up. We can get the derivative $L'(p)$ by differentiating both sides of equation (11) with respect to p. This becomes complicated because p appears in several different places. But when we simplify it all down, we get

(12) $\qquad Q' + pQ''L' = Q/L + y'L'$

where y' is the derivative of the dividend y(L) with respect to L.

Here is the key point. We already know from the FOC for maximization of y(L) that $y' = 0$ (see equation 9). Therefore the second term $y'L'$ on the right side of (12) is zero.

The rest of equation (12) can be rearranged to give

(13) $\qquad L'(p) = (Q/L - Q')/pQ''$

From the usual diminishing returns assumption, $pQ'' < 0$ so the denominator is negative. The numerator is the difference between average product Q/L and marginal product Q'.

It can be shown mathematically that when we have diminishing returns to labor, Q/L is a decreasing function of L, and the marginal product must be less than the average product.

This implies that the numerator $Q/L - Q'$ is positive. Therefore $L'(p)$ is *negative*.

Because output as a function of price is Q[L(p)], the slope of the firm's supply curve is

(14) $\qquad Q'[L(p)]L'(p) < 0$

The negative sign occurs because marginal product Q' is positive and $L'(p)$ is negative.

Therefore the firm has a downward sloping (or backward bending) supply curve. When the output price goes up, the firm uses less labor and therefore produces less output.

This conclusion doesn't make much sense. It says that when the output price goes up, so the firm is better off, it kicks out some existing members because this raises the dividend even more for the subset of members who are allowed to stay.

The problem is that we are maximizing a ratio, and there are two ways to make a ratio big: have a big numerator or a small denominator. Thus the Illyrian firm has a tendency to limit the number of members, and even expels some members if net income goes up.

A LABOR-MANAGED FIRM WITH A MEMBERSHIP MARKET

Suppose each worker provides one unit of labor and there are L_0 existing members of a labor-managed firm, so the firm currently has a labor input of L_0.

This group of workers must choose the firm's total labor input L, which could be larger than L_0. It could also be smaller than L_0 but let's not worry about that for now.

Each existing member (or insider) receives the following income:

(15) $[pQ(L) - F]/L + m(L - L_0)/L_0$

The first term is the same as the dividend y(L) in the Illyrian firm: net income divided by the number of workers L. Notice that this net income will have to be shared among all of the firm's members (including new members), not just the L_0 existing insiders.

The second term is the revenue obtained by the insiders from selling new membership rights. Let m be the membership fee paid by each new worker. There will be $L - L_0$ new members who pay the fee so total revenue from this source is $m(L - L_0)$. The resulting revenue is divided equally among the L_0 insiders.

The key question is how the membership fee m will be determined. Let's think about the maximum amount an outsider would be willing to pay. If an outsider joins the LMF, she gets the dividend $y(L) = [pQ(L) - F]/L$ minus the membership fee m. If she does not join the LMF, she goes to a KMF and gets the usual wage w on the external labor market.

The highest fee that such a person would pay to join the LMF is y - w (the gap between income in the LMF and income from the labor market). If m is less than this, then y - m > w and the outsider definitely wants to join the LMF. If m is more than this, then y - m < w and the outsider is better off going to the external labor market.

If the LMF insiders charge the maximum possible fee, we will have m = y - w. This is the membership fee that will arise when there is a competitive membership market. In this case an outsider is indifferent between joining the LMF and going to a KMF.

Now substitute m = y - w into (15) and use the definition $y(L) = [pQ(L) - F]L$. Each of the existing insiders gets

(16) $y(L) + [y(L) - w](L - L_0)/L_0$

When you do a little algebra, this reduces to

(17) $w + (1/L_0)[pQ(L) - wL - F]$

Equation (17) is the crucial result. Note that the existing LMF members have no control over w, which is determined in the external labor market. They also have no control over

L_0, which is just the current number of existing members. All they get to choose is L (by choosing how many new members will be admitted).

It should therefore be clear that the income of each insider is maximized by choosing L to maximize the expression in brackets: pQ(L) - wL - F.

But this is equal to profit! To check this, take another look at equation (1).

So what we have shown is that when an LMF has a competitive membership market, the existing members choose the labor input L in the same way as a profit-maximizing firm.

Because the first order condition for maximizing profit will be identical for the two kinds of firms, there will be no difference in their behavior.

It follows that all of the 'perverse' behavior of the Illyrian firm goes away (the backward bending supply curve, the effects of fixed cost on labor demand and output supply, etc.).

Why does this happen? Remember that the wage w played no role in the Illyrian model. However, with a membership market the wage w influences what an outsider pays to join the firm. Because insiders care not only about the dividend but also the membership fees they collect, they will care about the wage too.

It is still true that a new member receives a claim on the firm's net income, but the new member compensates the insiders for this claim when she pays the membership fee. So from the point of view of the insiders, the cost of adding a new member is w. This is the outsider's opportunity cost and she must receive this amount or she won't join the firm.

Accordingly, the insiders treat w as the price of each additional unit of labor. This causes them to set $pQ'(L)$ equal to w, exactly as a profit-maximizing firm would do.

Another way to think about this is that with a competitive membership market, outsiders get no 'surplus' from joining the LMF. They are indifferent between a KMF and an LMF. All of the 'surplus' from the LMF goes to the insiders and is shared equally among them. The insiders therefore want to maximize this surplus, which is equivalent to total profit.

These concepts are easiest to understand in the case when the firm expands by bringing in some new members. However, the same story works in reverse when the firm contracts.

If an existing member leaves the firm, his membership share is repurchased by the LMF at the price m (the departing member gets this amount as compensation for giving up his claim on the net income of the firm).

The departing member is indifferent between staying and leaving, and the insiders again choose L to maximize profit, even if it turns out that profit maximization implies $L < L_0$. Any existing member who leaves the firm does so voluntarily (unlike the Illyrian model, no one is forced out).

CLOSING COMMENTS

There are three general types of problems with the Illyrian model.

Theoretical problems.

There is no reason to assume that a firm controlled by capital suppliers will maximize total profit while a firm controlled by labor suppliers will maximize a ratio. Why not assume instead that a KMF maximizes net income per unit of capital, while an LMF maxes profit? Economists who adopt the Illyrian model do not identify any differences between capital and labor that would lead to such differences in behavior, so the Illyrian model violates the symmetry principle.

It is also unclear how decisions are made in the Illyrian model. Until we know the total labor input L, we don't know how many decision-makers there are. Who is choosing L?

Another problem is that the Illyrian model ignores the external labor market. The value of labor's marginal product in the Illyrian firm could exceed the wage w. In this case it is possible to achieve Pareto improvements by expanding the firm in a way that makes both existing members and new members better off simultaneously. This continues to be true until the firm reaches the profit-maximizing level of labor input. The Illyrian model fails to explain why these Pareto improvements are not implemented.

Institutional problems.

In real LMFs, members are not expelled simply because this would make the remaining members better off. The existing members of the firm have property rights that prevent arbitrary expulsion, and would have to receive some compensation if they leave.

The Illyrian model also says nothing about how the winners and losers would be chosen in a situation of this kind. Do we have a majority vote about who will be expelled?

Empirical problems.

There has been a lot of good econometric research comparing the behavior of LMFs and KMFs operating in the same industry. People do not find the backward-bending output supply curve predicted by the Illyrian model.

What they do find is that LMFs have output supply curves and input demand curves that are less elastic than for similar KMFs. This implies that when there are shocks to prices, the LMFs tend to absorb these shocks through variations in the incomes of the members, while KMFs tend to absorb shocks through variations in quantities of inputs and outputs.

Evidence of this kind indicates that LMFs do not have perfectly competitive membership markets. If they had such markets, they would maximize profit; however, their behavior differs from what a profit-maximizing firm would do. In particular, LMFs seem to place

a high value on maintaining existing employment levels when market conditions are bad, even if this means that profit is sometimes lower than what it would be in a KMF.

The Illyrian framework has been highly influential in the LMF literature since it was first introduced by Ward back in 1958. In my opinion, this is quite unfortunate because it has no theoretical foundation and there is little evidence that it describes the behavior of real LMFs. I have argued for a long time that this model should be discarded and replaced by an alternative framework that makes more sense.

I think a more productive approach would be to ask why LMF membership markets tend to be imperfect or completely absent. At the same time, we should ask why KMFs don't seem to have similar problems (stock markets are very common). I believe that there are differences in the nature of capital and labor that could explain these observations. If we can identify these differences and discover why they lead to differences in firm behavior, it might be possible to make more progress in understanding why LMFs are rare.
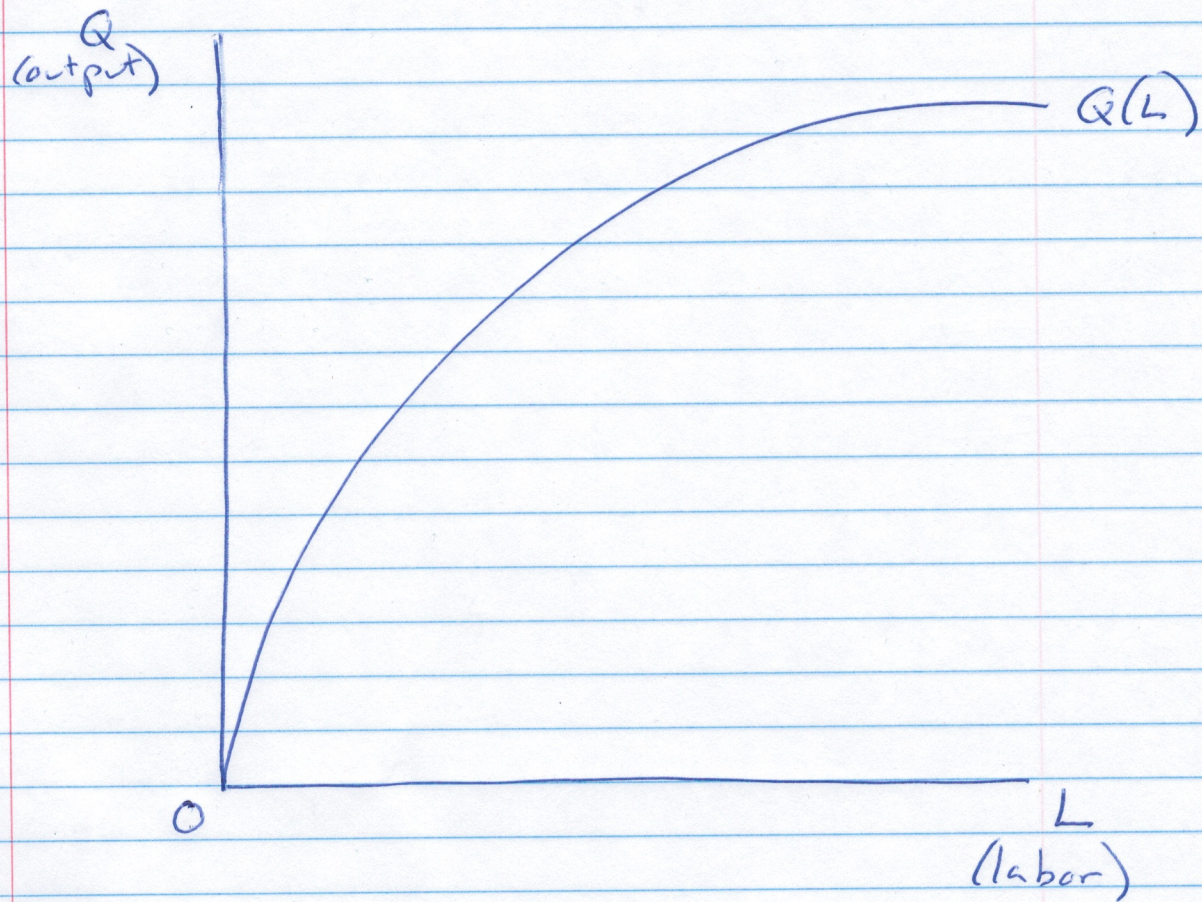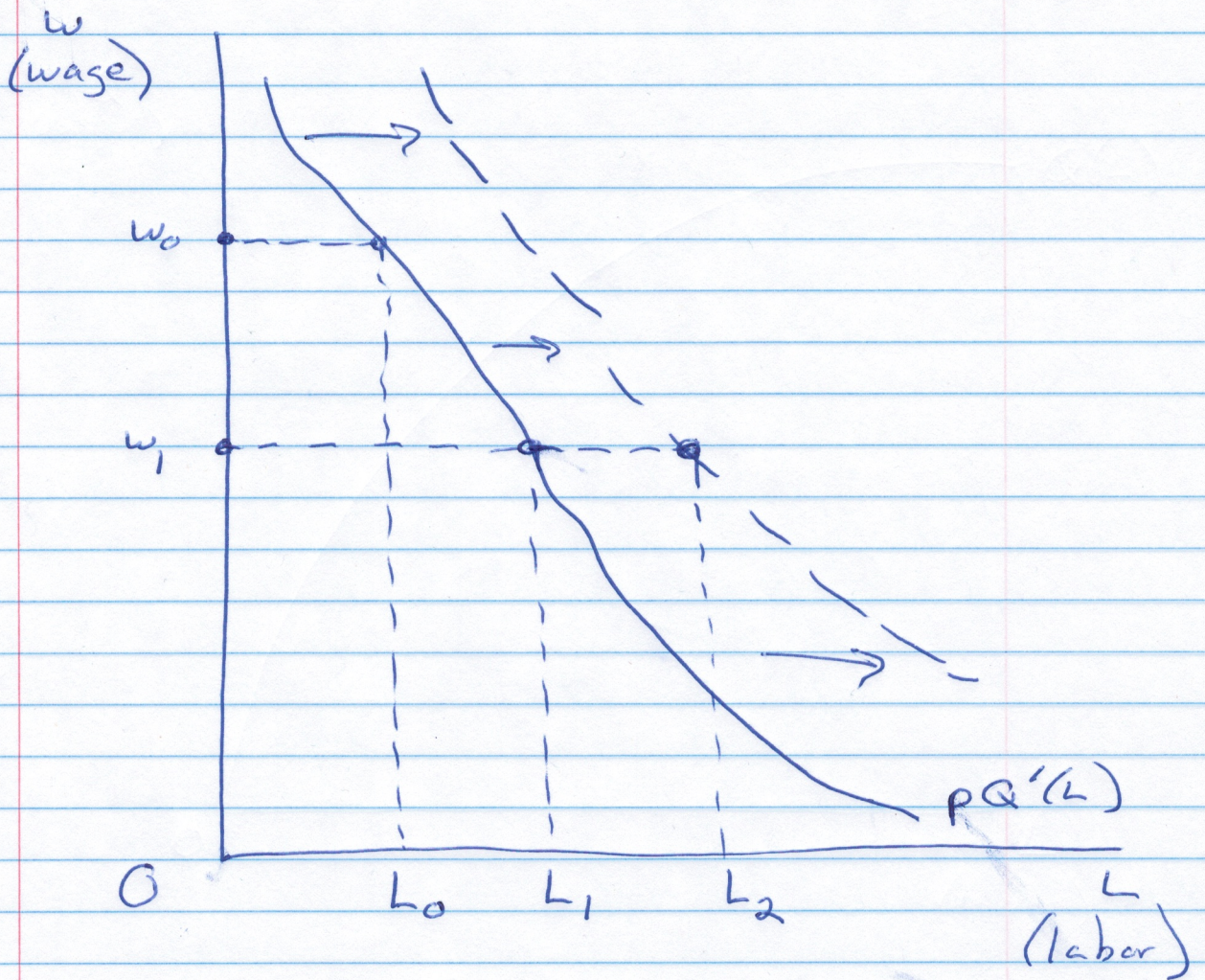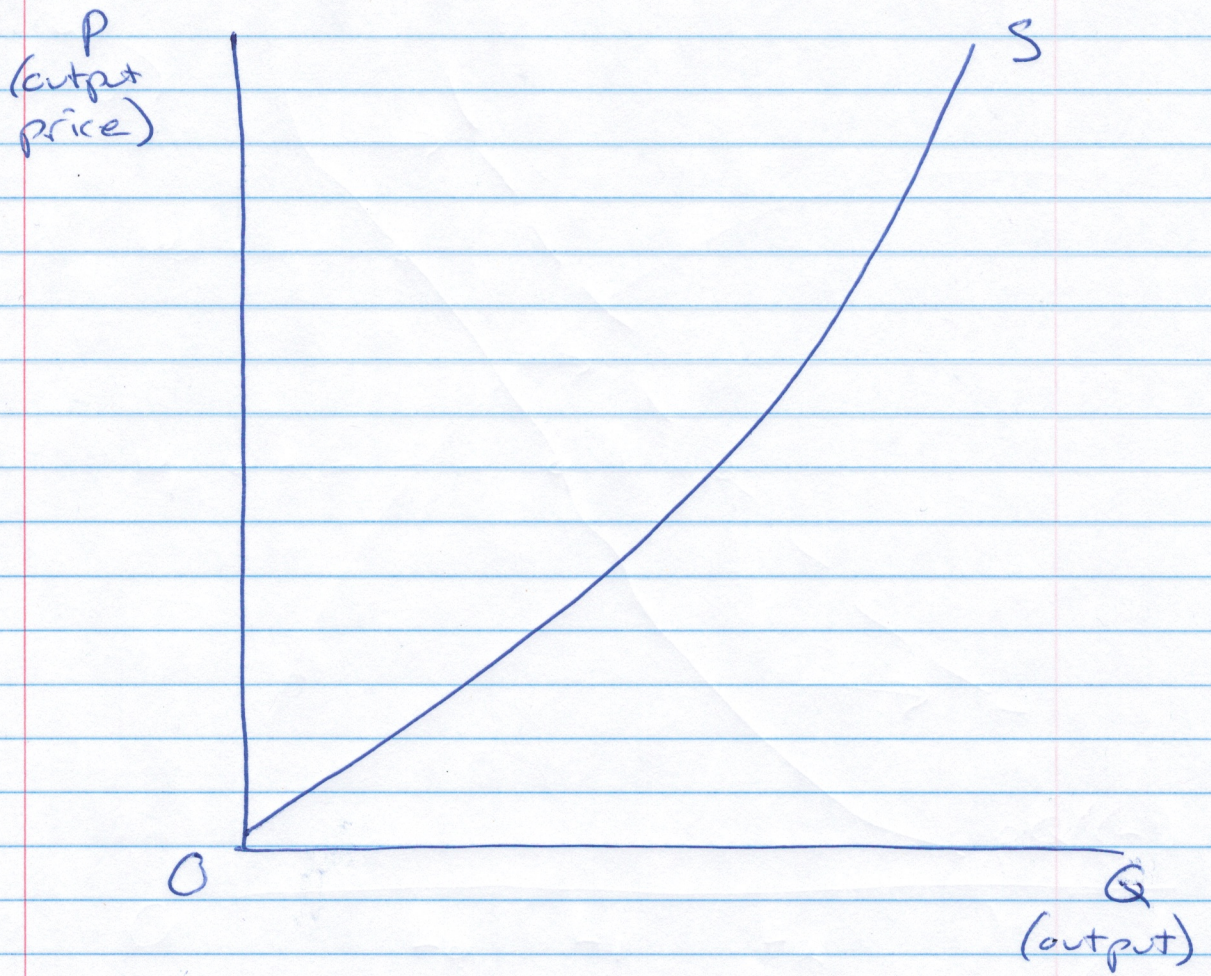
Figure 1

Production Function in Short Run
with Diminishing Returns to Labor

Demand Curve for Labor
In a Profit - Maximizing Firm

Figure 2

P
(output price)

S

O

Q
(output)

Supply Curve for a Profit-Maximizing Firm

Figure 3

Econ 426W

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Lecture Notes on Chapter 8

These notes discuss how productivity is defined in economic theory, and how people have used econometric methods to compare the productivity of KMFs and LMFs. This subject is closely related to the empirical research discussed in section 8.7 of the book.

We have encountered a number of productivity-related questions during the semester:

(a)   Are plywood coops more (or less) productive than conventional plywood mills?
(b)   How does the productivity of Mondragon and Lega cooperatives compare with the productivity of similar KMFs?
(c)   Do ESOPs increase productivity? What about profit sharing?
(d)   Does codetermination have any effect on productivity?

There are also important theoretical issues involving productivity. As we saw in chapter 8, some economists have tried to explain the rarity of LMFs by claiming that they have difficulties with work incentives. For example, Alchian and Demsetz argue that KMFs usually provide stronger work incentives than LMFs. If AD are right, we might expect to find that LMFs have lower productivity than similar KMFs. This is a testable hypothesis.

One common approach to questions like (a) and (b) is to find some country and industry where KMFs and LMFs both exist. The economist collects data on inputs and outputs for each type of firm. Then the economist divides output by labor input for each firm, giving the ratio Q/L, and tests to see whether one group of firms or the other has a higher mean for this ratio. The null hypothesis is no difference (interpreted as equal productivity).

There is a major problem with this method, which is illustrated in Figure 1. In this graph we are in the long run and there are two variable inputs: K (on the horizontal axis) and L (on the vertical axis). I have drawn isoquants for the output levels Q_0, Q_1, and Q_2.

Suppose we see an LMF and a KMF. Both are producing the output level Q_0 but they are operating at different points on this isoquant. The LMF is operating at point A where the output to labor ratio Q/L is low. The KMF is operating at point B where the Q/L ratio is high. A naive economist might conclude that the LMF has lower productivity.

However, there are two inputs and it is arbitrary to focus on the ratio Q/L. Why aren't we looking at the ratio Q/K (output per unit of capital) instead? If we made this comparison, we would find that Q/K is higher at point A than at point B, and we would conclude that the LMF has higher productivity.
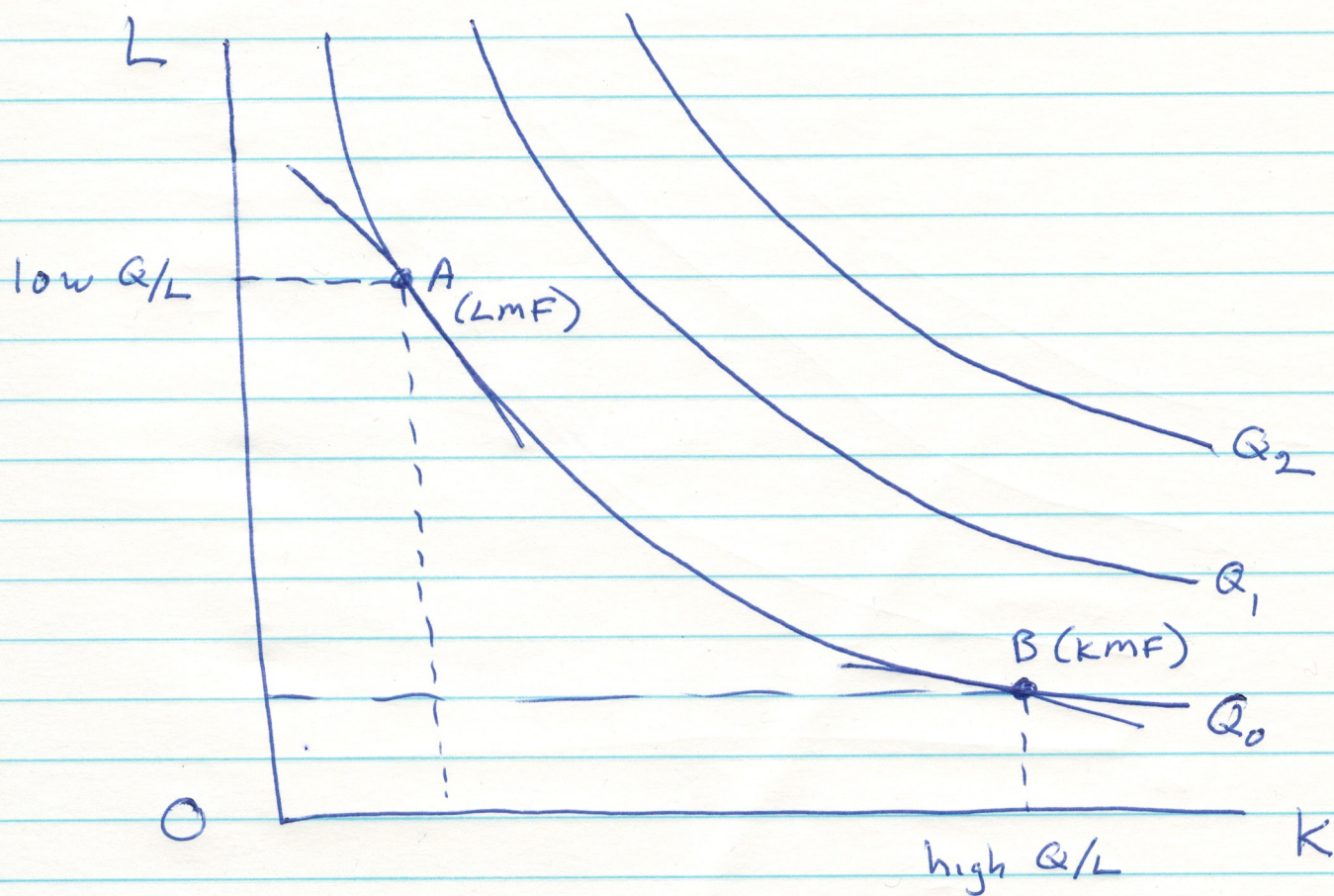
Figure 1

KMF and LMF with Different
Long Run Input Levels

The point I want to make is that both conclusions are misleading, whether we look at the ratio Q/L (average product of labor) or the ratio Q/K (average product of capital). In fact the two firms in Figure 1 have identical isoquants, an identical production function, and thus identical productivity.

Why would firms with the same production technology operate at different points on the same isoquant? This could occur if they face different input prices. For example, people often argue that LMFs have trouble getting capital, so maybe they face a higher price for capital than KMFs and try to avoid using it (they substitute more labor instead). Or one could argue that workers prefer firms where they have control rights, so KMFs have to offer higher wages as compensation (causing KMFs to substitute more capital instead).

I haven't drawn any isocost lines in Figure 1, but you should remember from Econ 201 that the slope of an isocost line is determined by the ratio of the input prices. So if the two kinds of firms confront different input prices, their isocost lines will have different slopes. Thus a cost-minimizing LMF might go to point A while a cost-minimizing KMF might go to point B.

This would not be a big problem if we could observe the prices each type of firm pays for its inputs. But in practice it can be quite difficult to compare input prices between KMFs and LMFs, so it is hard to control for such price differences statistically.

Another strategy might be to compare labor productivity (Q/L) between KMFs and LMFs while controlling for the level of capital used by each firm. This is not a terrible idea (it is better than just looking at differences in the mean values of Q/L). However, there is a better way to think about measuring productivity.

Suppose we define total factor productivity (TFP) as

(1) $TFP = Q/K^{\theta}L^{1-\theta}$

where Q = output, K = quantity of capital input, L = quantity of labor input, θ = share of capital in total cost, and $1-\theta$ = share of labor in total cost. Note that if capital is the only input so $\theta = 1$, this reduces to Q/K (the average product of capital), while if labor is the only input so $\theta = 0$, this reduces to Q/L (the average product of labor). But usually θ is something between zero and one because the firm uses some of each input.

The general idea behind TFP is that we want to assign weights to each input based on how important the input is to the firm, and we assess 'importance' by the share of total cost that must be paid to that input. This definition is easily generalized to firms with many inputs, but here we just consider the simple case with capital and labor.

What I want to do is calculate TFP for the case of a Cobb-Douglas production function:

(2) $Q = AK^{\alpha}L^{\beta}$ where $\alpha > 0$, $\beta > 0$, and $A > 0$.

Let's define p = output price, r = price of capital, w = price of labor. Then profit is

(3) $\qquad \pi \qquad = pQ - rK - wL$

$\qquad\qquad\qquad = pAK^{\alpha}L^{\beta} - rK - wL$

Now assume the firm is a price taker for all inputs and outputs. Also assume both capital and labor are variable (this is a long run analysis).

To obtain first order conditions for profit maximization, take a derivative of profit with respect to capital and set it equal to zero. Then do the same thing for labor. This gives

(4) $\qquad pA\alpha K^{\alpha\text{-}1}L^{\beta} - r = 0 \qquad$ or equivalently $\qquad \alpha pQ/K = r$

$\qquad\qquad pA\beta K^{\alpha}L^{\beta\text{-}1} - w = 0 \qquad$ or equivalently $\qquad \beta pQ/L = w$

In order to calculate the cost shares θ and $1\text{-}\theta$ in the definition of TFP, we use the results from (4) to obtain the total expenditures rK and wL for each input:

(5) $\qquad \theta \qquad = rK/(rK + wL) = \alpha pQ/(\alpha pQ + \beta pQ) = \alpha/(\alpha + \beta)$

$\qquad\qquad 1\text{-}\theta \qquad = wL/(rK + wL) = \beta pQ/(\alpha pQ + \beta pQ) = \beta/(\alpha + \beta)$

Now substitute the production function from (2) into (1), and substitute the results for θ and $1\text{-}\theta$ from (5) into (1). Finally, make one last assumption: suppose we have constant returns to scale, which implies $\alpha + \beta = 1$ (the exponents in the Cobb-Douglas production function add up to one). Some algebra then shows that

(6) $\qquad$ TFP = A

Thus total factor productivity is equal to the constant A in the production function. This is true regardless of the input prices r and w. Therefore, unlike the situation in Figure 1, we don't have to be concerned that KMFs and LMFs might face different input prices. Even if they do, we still get TFP = A for each type of firm.

We had to make a number of simplifying assumptions to obtain this result: (a) the firm has Cobb-Douglas technology; (b) it operates in perfectly competitive input and output markets; (c) it maximizes profit; and (d) it has constant returns to scale. These are not trivial assumptions. For example, if LMFs don't maximize profit then assumption (c) is not valid for these firms.

For the moment, let's not worry about this last point (suppose we are looking at LMFs that do maximize profit because they have perfect membership markets).

The next question I want to address is how we can use TFP to compare KMFs and LMFs. Suppose we have a large sample of firms, some KMFs and some LMFs. They all operate in the same industry and use similar production methods.

For each firm i, we observe its output Q_i, capital input K_i, and labor input L_i. We define a variable where $LMF_i = 1$ if firm i is an LMF and $LMF_i = 0$ if firm i is a KMF. Let ε_i be a random error term.

Assume all firms have Cobb-Douglas production functions. Take natural logs on both sides of equation (2). This gives the regression equation

(7) $\ln Q_i = \ln A + \alpha \ln K_i + \beta \ln L_i + \gamma LMF_i + \varepsilon_i$

Note that taking logs gives a linear equation where the coefficients are easy to estimate.

If we have a KMF, then by definition $LMF_i = 0$ and we can ignore the coefficient γ. As shown earlier, total factor productivity is A. Therefore the natural log of TFP for a KMF will be equal to the intercept term $\ln A$ in the regression equation.

On the other hand if we have an LMF then by definition $LMF_i = 1$. Therefore the natural log of TFP for an LMF is equal to $\ln A + \gamma$.

If we want to test the hypothesis that an LMF has higher total factor productivity than a KMF, in principle this is straightforward: just test the hypothesis that the coefficient γ is positive. On the other hand, a KMF has higher TFP if the coefficient γ is negative.

Note: there are some econometric issues here. For example, the firm chooses K and L so the input quantities on the right hand side of (7) are endogenous. Because I am a theorist rather than an econometrician, I will not discuss endogeneity problems. If you ever want to estimate a production function, get some advice from a competent econometrician first.

What happens when people do estimate such regressions? The most common outcome is that they cannot reject the null hypothesis $\gamma = 0$. This implies that there is no statistically significant difference in productivity between KMFs and LMFs.

Such results are not surprising in cases where both KMFs and LMFs have been operating in the same industry for a long time. The fact that both types of firm continue to survive suggests that their productivity levels are probably not very different.

But there are some complications. Perhaps the best research of this kind is by Fakhfakh et al. (2012), who used French data for several industries having both KMFs and LMFs. They found that the firms did not necessarily have Cobb-Douglas production functions (so we can't just say TFP = A), and their productivities did not just differ by an intercept term in the regression. They also found evidence consistent with the idea that KMFs and LMFs use different input levels even when they operate in the same industry.

Their statistical techniques let KMFs and LMFs have different production functions even if the firms are in the same industry. The authors can then compute predicted outputs for any given input levels, for each type of firm. The results are

(a)   In some industries, it would not matter whether the KMF or LMF technology was used (there is no difference in predicted output, given the actual input levels used by each type of firm).

(b)   In other industries, the LMFs got higher outputs from their own technology than they would have gotten from using the KMF technology (holding inputs constant at the observed LMF levels).

(c)   Moreover, in these industries the KMFs obtained lower outputs from their own technology than they would have gotten by using the LMF technology (holding inputs constant at the observed KMF levels).

In (b) and (c), the differences are statistically significant. The authors think that in these industries, the LMFs have productivity advantages for incentive and information reasons. For example, LMFs tend to use fewer supervisors (probably because workers can monitor each other's effort) and they might do a better job of exploiting worker knowledge about production activities.

The result in (c) is interesting: it suggests that KMFs would like to imitate LMF methods but for some reason they are unable to do this.

Craig and Pencavel (1995) obtained similar results for the US plywood firms (their work is mentioned in Governing the Firm).

Another bit of circumstantial evidence on productivity: survival rates seem to be at least as high for LMFs as for KMFs in the same industry. This is consistent with the idea that LMF productivity is at least as high as KMF productivity (if it were lower, you might expect the LMFs to fail more often).

For example, using a sample of firms from Uruguay, Burdin (2014) finds no significant difference in survival rates in manufacturing or transportation, but a big difference in the service sector (LMFs are less likely to exit than KMFs). Burdin thinks the reason might be that LMFs have an advantage in more labor-intensive activities. He agrees with the view of Fakhfakh et al. (2012) that LMFs may have productivity advantages in certain industries due to fewer supervisors and more mutual monitoring, although Burdin was not able to estimate productivity directly (he didn't have the data needed for this).

The apparent differences in survival rates, at least for some industries, raise interesting theoretical issues. We usually assume that firms maximize profit. Moreover, in models of perfect competition with free entry and exit in the long run, the equilibrium level of profit is zero (this is also the maximum level of profit). So any type of firm that is not

maximizing profit must have negative profit in the long run and should exit. Therefore only firms that maximize profit will survive.

But we know LMFs have different comparative static behavior from KMFs (the LMFs have less elastic output supply and input demand curves). So if KMFs are maximizing profit, then the LMFs are not.

There has also been some econometric research that directly tests the hypothesis of profit maximization by LMFs and rejects this hypothesis.

So how can we explain why LMFs sometimes survive in the long run when they have to compete against KMF rivals?

One possible explanation is that surviving LMFs could have productivity advantages that compensate for their non-profit-maximizing behavior.

In my opinion, the empirical evidence on productivity and survival indicates that LMFs are probably not rare due to problems with work incentives. I think we can safely reject that hypothesis, at least in most cases. A more plausible view is that LMFs often have a small but significant advantage with respect to effort and productivity.

This interpretation of the evidence leaves a number of open questions.

1.   If LMFs achieve better productivity and survival results than KMFs, why haven't they already taken over the world and driven out KMFs? Maybe the reason is that LMFs don't maximize profit while KMFs do; or maybe there are barriers to entry that make LMF creation relatively rare (although they do well once they exist).

2.   What do we know about possible barriers to LMF entry? Using manufacturing data from the UK in the 1980s, Podivinsky and Stewart (2007, 2009) found that there was less LMF entry into capital-intensive industries, and less LMF entry into riskier industries. Other researchers have obtained similar results.

3.   This suggests that there may be some merit to the hypothesis that workers have limited wealth and face constraints in the capital market; and/or the hypothesis that workers are risk averse and therefore avoid high-risk industries.

4.   But why do LMFs have trouble getting capital? And if they do, why don't KMFs have equal trouble getting labor? Why is there an asymmetry?

We will try to develop answers to these questions in the remaining chapters.

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Econ 426W

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Lecture Notes on Chapter 9

In chapter 8, we considered two main types of hypotheses about why LMFs are rare: ideas involving asset ownership and ideas involving work incentives.

Chapter 9 adds three more hypotheses to the list: capital market imperfections, issues about risk and diversification, and issues about collective choice. I will summarize each hypothesis, raise some questions about its theoretical foundations, and discuss empirical evidence for or against it.

Capital market imperfections.

This is probably the most popular hypothesis about why LMFs are rare. The basic idea is simple: workers have limited wealth so they have trouble financing LMFs. If they want to start firms, they have to get capital from outsiders like banks or investors. But capital markets are imperfect, so this is difficult. On the other hand, wealthy investors have no need to go to the capital market, so they can easily start KMFs.

The basic story has various nuances. For example, it might be easier to get financing for an LMF if it is possible to lease physical assets rather than owning them. This decreases the amount of wealth workers would have to invest up front in order to create an LMF.

We saw in chapter 8 that the costs of leasing assets could depend upon factors involving information, incentives, and bargaining. For example, moral hazard could lead to issues with depreciation, or adverse selection could imply that only bad assets are available, or bargaining could be costly in situations where assets are highly specialized.

Another nuance involves collateral. Banks are more willing to make loans if borrowers will use the loan to buy general-purpose assets. In this case, the bank can easily take the asset and resell it if the borrower defaults on the loan. For example, if someone wants a mortgage in order to buy a house, the house can be used as collateral. If the borrower fails to make the mortgage payments, the bank can take over the house and put it up for sale, so the bank won't lose the entire value of the loan.

This suggests that the ability of workers to get loans may depend on what kind of assets they want to buy: are they easily resold like computers or raw materials (good collateral), or are they highly specialized machines with few alternative uses (poor collateral)?

There are two main kinds of capital market imperfections workers could face:

(a)   asymmetric information (adverse selection or moral hazard)
(b)   commitment problems (inability to make credible promises about future actions).

Either of these could raise the cost of capital for workers, or limit the amount of capital workers are able to obtain. However, they have somewhat different implications. I will come back to this distinction later.

First, however, I have some general questions about the hypothesis that the rarity of LMFs can be explained by capital market imperfections.

Question 1: The hypothesis might explain why poor workers don't start LMFs. Does it also explain why rich workers don't start LMFs?

Question 2: The hypothesis assumes that wealthy investors prefer to start KMFs. Why aren't they willing to start LMFs? What if LMFs would be more productive than KMFs?

Question 3: What if workers need to invest in human capital? Can these investments be financed using collateral? Is there any collateral for student loans?

Question 4: Why isn't the problem symmetric? If LMFs have difficulties in the capital market, why don't KMFs have parallel difficulties in the labor market?

Empirical implications of the hypothesis:

(a)   We should see fewer LMFs in capital-intensive industries.

(b)   We should see fewer LMFs in industries where leasing of physical assets would be problematic.

(c)   We should see fewer LMFs in industries where assets are highly specialized and do not provide good collateral for loans.

There is some evidence that LMF entry is less common in capital-intensive industries (Podivinsky and Stewart, 2007, 2009).

The evidence is less clear on (b) and (c), although they are probably true.

However, some observations cast doubt on the claim that workers cannot finance a firm.

Question 5: Sometimes employees buy out failing KMFs in order to save their jobs (we will talk more about this in chapter 10). Does this contradict the hypothesis?

Question 6: Sometimes employees build up significant equity investments via pension plans like ESOPs. Does this contradict the hypothesis?

I also want to dig into the theoretical issues a little more deeply.

Question 7: Suppose the capital market imperfection involves adverse selection, where banks or investors cannot observe the true quality of an LMF project. What can workers do to signal their true quality?

Question 8: Suppose the capital market imperfection involves moral hazard (workers might fail to supply effort or not repay investors). Can contracts solve such problems?

Information asymmetry is not the only source of capital market imperfections. Even if everyone has full information about everything, contracts are incomplete, so it may not be possible to make legally binding commitments about future actions.

For example, banks may worry that LMFs will not repay loans, or outside investors who do not have voting rights may worry that LMFs will not pay dividends.

Question 9: Can repeated games be used to solve these problems?

I will close this section with a broader question.

Question 10: We have seen cases where LMFs were successful. How did these firms obtain capital? Does their success contradict the claim that LMFs are rare due to capital market imperfections? Why or why not?

Risk aversion and portfolio diversification.

Another popular hypothesis about the rarity of LMFs goes like this. Workers are risk averse. Even if they have enough wealth to finance an LMF, they often prefer not to, because this would force them to put a large portion of their wealth into a single firm.

What they would rather do is to receive a fixed wage and have outside investors bear most of the risk. This enables individual workers to spread their wealth across many firms. Because the returns received from different firms are imperfectly correlated, a diversified portfolio of this kind reduces the financial risk an individual worker faces.

Often people combine this with an argument that workers cannot diversify their human capital across firms, so LMFs are really bad from a risk perspective: they force workers to invest their human capital and their financial capital in the same firm. Accordingly it is even more important for workers to have diversified financial investments.

Note: this argument does not automatically lead to KMFs. All it really says is that people who are more willing to bear risk will tend to control firms. If capital can be obtained on a competitive market, there is no obvious reason why the same people must bear risk and supply capital. Making this linkage requires a further theoretical step (maybe rich people are willing to bear risk and also do not have to deal with capital market imperfections).

What does this hypothesis predict about the distribution of LMFs across industries? The answer is not entirely clear.

(a)   Some economists like Meade have argued that LMFs would avoid risky industries where prices of inputs and outputs are volatile, or where there are large business cycle risks.

(b)   Other economists like Bonin, Jones, and Putterman have argued that LMFs should arise in risky industries because they provide greater job security than KMFs.

The evidence for (a) is not especially strong. For example, we find LMFs in the plywood industry, which has big price swings for inputs and outputs. In Europe, worker coops are common in the construction industry, which has large business cycle risks.

On the other hand, (b) raises theoretical issues. Yes, workers care about the risk of job loss, but LMFs still face fluctuations in the incomes of the individual members. Why is one type of risk more important than the other?

A further complication is that workers may have differing attitudes toward risk, and may self-select into different types of firms. Those who are more tolerant of risk may want to join LMFs, while those who are more risk averse may prefer KMFs (or vice versa).

A small empirical note: there is evidence that accident rates are higher in plywood coops.

Now let's go back to the theoretical foundations of the story. At least in principle, there are various ways for workers to reduce risks without giving up control rights.

Question 1: Why can't LMFs reduce their risk by making contracts with insurance firms?

Question 2: Why can't LMFs reduce their risk by selling non-voting equity shares?

Question 3: Why can't groups of LMFs pool their incomes and reduce their overall risk?

Question 4: Why can't moral hazard problems be solved through repeated games?

What about empirical evidence?

There is some support for this hypothesis. For example, Podivinsky and Stewart (2007, 2009) have found for UK manufacturing in the 1980s that LMFs were less likely to enter industries with a high variance in profit.

But there are also a number of empirical problems.

(a)   Ben-Ner et al. (2000) looked for evidence that ESOPs, profit sharing, and worker participation in decision-making are affected by the standard deviation of industry profit, or by the size of employment fluctuations. They found no effects.

(b)   Many workers have large investments in their own firms through pension plans.

(c)   If workers are risk averse and this is a major factor in determining whether we see KMFs or LMFs, you might expect that when there is a high risk of layoffs, KMFs would have to compensate workers by paying higher average wages. Such effects seem to be very small.

(d)   In some cases like family farming, people voluntarily engage in occupations with high financial risks.

Question 5: Based on these empirical observations, should we reject the hypothesis that LMFs are rare due to worker risk aversion?

The collective choice hypothesis.

This hypothesis about the rarity of LMFs has been advocated most strongly by Henry Hansmann, although a number of other writers also think it could be important.

The idea is that workers have diverse (or heterogeneous) preferences: some care about wages, others care about job security, others care about working conditions, and so on.

However, investors have similar (or homogeneous) preferences and often agree that the firm should maximize profit (in a static model) or present value (in a dynamic model).

Hansmann's argument involves transaction costs. He says that LMFs usually have high costs of making collective decisions while KMFs do not. Therefore KMFs are common and LMFs are rare.

Depending on who is telling the story, the costs of collective choice in LMFs may take the form of voting cycles or bargaining costs. Here is the story about voting cycles.

Suppose we have three people named 1, 2, and 3. They have to choose among three alternative policies called A, B, and C.

Person 1 ranks the policies from best to worst as A, B, C.
Person 2 ranks the policies from best to worst as B, C, A.
Person 3 ranks the policies from best to worst as C, A, B.

Assume that the three people make decisions by majority voting.

If we have a meeting where people vote between A and B, option A will win (persons 1 and 3 prefer it).

If we have a meeting where people vote between B and C, option B will win (persons 1 and 2 prefer it).

If we have a meeting where people vote between C and A, option C will win (persons 2 and 3 prefer it).

This implies that if dissatisfied people keep demanding additional meetings, the voting process can just cycle around from A to B to C and back to A again, without any stable outcome. Obviously this would not be a great way to run a firm.

Instead of voting, you could imagine a bargaining process where the members of the firm decide what to do and pay compensation to members who are unhappy with the result. It is easy to see how this can cause problems (bargaining may take a lot of time, people may have asymmetric information about what they are willing to pay or accept, and so on).

Thus it is clear that preference heterogeneity can cause problems with collective decision-making in firms.

However, it is also clear that similar problems arise in other situations where groups have to make decisions (for example, decisions about government policies). There are certain standard solutions:

(a)   Have large groups elect representatives, who make decisions in smaller groups. This is what happens when individual citizens vote for political candidates.

(b)   Don't let people keep re-opening an issue that has already been settled. If there is control over the policies placed on the agenda, voting cycles can be avoided.

(c)   In politics there is a practice called 'log rolling', where someone says, "If you vote for the thing I want, I'll vote for the thing you want". This is often a useful way of reaching an agreement.

(d)   In governments, many decisions are made by civil servants rather than politicians. Similarly in a firm a lot of decisions can be delegated to managers, and the board of directors can focus on evaluating the overall performance of the top managers.

Question 1: Would these kinds of solutions work in LMFs? Why or why not?

There are also some theoretical issues. Why is it that labor suppliers have heterogenous preferences while capital suppliers do not? Is there some difference between capital and labor that can explain this?

I will sharpen this question a bit. There is a large literature in financial economics where people prove mathematically that when there are competitive stock markets, investors in a KMF will unanimously support maximization of the market value of the firm's shares.

However, it is unclear why the same mathematical results would not apply to LMFs with competitive membership markets. You can change all the labels from K to L and arrive at the same conclusion: workers in LMFs will unanimously support maximization of the market value of the firm's membership rights.

For the collective choice hypothesis to make any sense, we have to identify a difference between capital and labor that leads to perfect stock markets while leading to imperfect membership markets.

I'll come back to this issue below. But here is a preliminary question.

Question 2: Is it true that investors in KMFs have identical preferences about the firm's decisions? Or do they sometimes disagree with one another?

Now let's return to the issue of how stock markets differ from membership markets.

One argument you could make is that investors can easily diversify their wealth across many different firms, while workers cannot. But this argument has potential problems. Suppose there are two types of workers, who disagree about the relative importance of income versus working conditions. Why not just have two LMFs, where all the workers of one type go to firm A and have high incomes, while all the workers of the other type go to firm B and have good working conditions? If this kind of self-selection is possible then the workers in each LMF will be unanimous and there is no collective choice issue.

Question 3: In the real world, would self-selection eliminate preference heterogeneity within individual LMFs?

Another argument you could make is that financial capital is highly mobile (it can move easily anywhere in the world) while workers are not (they often have significant costs of leaving their families or communities to go somewhere else).

Dow and Skillman (2007) argued that in this situation we can have an equilibrium where investors in KMFs unanimously agree on the firm's goals while workers in LMFs do not.

These authors did not focus on transaction cost ideas of the Hansmann type. Instead they argued that LMFs that did not maximize profit would generally be vulnerable to takeover by investors, while KMFs that did maximize profit would be less vulnerable to a takeover by employees (because the employees have trouble agreeing on the policies of the firm).

We will examine conversions of KMFs into LMFs and vice versa in chapter 10.

A third type of argument is that membership markets are more vulnerable to adverse selection problems than stock markets. We will also discuss this issue in chapter 10.

One more theoretical point: you could argue that because workers have heterogeneous preferences, LMFs are a good thing. For example, working conditions are a local public good for employees. The capital suppliers in a KMF do not directly observe employee preferences for such public goods, so they may not supply them efficiently. But in an LMF the workers themselves decide about the level of these public goods, and make the necessary tradeoffs between working conditions and income, which may lead to a better allocation of resources.

Here are a few empirical observations relevant for the collective choice hypothesis.

(a)   LMFs sometimes put a lot of effort into screening workers to ensure that they have similar preferences.

(b)   LMFs sometimes arise in situations where workers have similar cultural beliefs.

(c)   LMFs often use strategies like representative democracy and agenda control to limit voting cycles.

(d)   LMFs delegate decisions to managers (but they may frequently fire the manager).

(e)   LMFs often arise in industries where most workers have similar skills and duties.

(f)   LMFs sometimes exclude groups of workers with different skills from decision-making roles (such as clerical workers or technical support staff).

Question 4: There are successful LMFs such as the plywood coops, Mondragon coops, and Lega coops. Do these cases show that the collective choice hypothesis is incorrect? If the hypothesis is correct, how did the successful LMFs overcome the problem?

Question 5: Assuming we do accept the collective choice hypothesis, does it explain all of the important empirical facts about LMFs? Or do we need other hypotheses too?

Econ 426W

Greg Dow

November 19, 2021

Lecture Notes on Chapter 10

These notes are mainly relevant for section 10.2 in "Governing the Firm" (2003). They are based on a model in chapter 10 of my book "The Labor-Managed Firm: Theoretical Foundations" (2018). I am not expecting you to read anything from the 2018 book.

Introduction

One thing we know for sure about LMFs is that they are created much less often than KMFs. People can argue about whether LMFs have good productivity, whether they have good survival rates, and so on, but there is no doubt that they are rarely created.

We have seen some theoretical stories that might help to explain this observation. For example, in chapter 9 we considered a hypothesis based on the idea that workers have limited wealth and capital markets are imperfect. We also considered a hypothesis that workers are risk averse and prefer not to invest most of their wealth in a single firm.

These ideas may well be correct, but they don't answer the following question: why don't wealthy entrepreneurs create LMFs rather than KMFs, especially in cases where an LMF would have higher productivity? I will suggest one possible answer in these notes.

The usual answer in the literature is as follows. Suppose a new firm would have profit π > 0. Assume this profit would be the same whether the firm is a KMF or an LMF (they have equal productivity).

An entrepreneur who creates a KMF gets the full amount π.

If the entrepreneur creates an LMF with n members and the members share the firm's profit equally, she only gets π/n. So she prefers to create a KMF.

This argument is unconvincing. If the entrepreneur chose to create an LMF, she could charge a membership fee equal to π/n, collect this amount from each of n workers, and capture the entire profit π through competitive bidding among potential LMF members.

In this case, the entrepreneur is indifferent between an LMF and a KMF. If an LMF has even a small productivity advantage over a KMF, she would prefer to create an LMF.

BUT: When workers cannot observe the true quality of the entrepreneur's project, they may not be willing to pay much for control rights.

As a result, due to adverse selection the entrepreneur may create a KMF even if an LMF would have been more productive.

I assume the entrepreneur is wealthy enough to create a firm without going to the capital market. There is no need to borrow from a bank or bring in outside investors.

The entrepreneur is a worker as well as an investor, is a member of the firm's control group, and decides how many other workers (if any) will be offered control rights.

I refer to all workers with control rights, including the entrepreneur, as *members* of the firm. The members have access to all information held by the entrepreneur about firm technology. This increases productivity. At the same time, members have bargaining power and obtain equal shares of firm profit.

I treat workers' control as a matter of degree, where some workers may become members while others become employees. The latter do not have access to information about the firm's technology, are told what to do, and receive a competitive wage.

If the entrepreneur decides not to offer control positions to anyone else, I interpret this as a KMF in which all profit goes to the entrepreneur.

When most new projects are good so adverse selection problems are small, uninformed workers may be willing to pay large amounts to become members, and this may offset most of the effects from the bargaining that will occur after control positions have been assigned. In this case an entrepreneur with a good project may create an LMF.

But when most new projects are bad so adverse selection problems are large, workers

will not offer to pay much for control rights. In this case an entrepreneur with a good

project will create a KMF.

Note that we are not concerned here with adverse selection involving the productivity of

individual workers. Adverse selection involves the quality of the entrepreneur's project,

which is a different thing.

Although the membership market is imperfect, the problem is on the supply side (the

quality of the firm selling membership shares), not the demand side (the quality of the

workers who are buying the shares).

The Formal Model

Suppose an entrepreneur (E) organizes the firm. E has a project that may be good or bad.

E needs N workers to supply labor.

If the project is good, E faces the profit function $\pi(n)$ and chooses $n \in \{1 .. N\}$ where n

is the number of members. The profit function has two important features.

A1 $0 < \pi(n) < \pi(n+1)$ for all $n = 1 .. N{-}1$ and

A2 $\pi(n)/n > \pi(n+1)/(n+1)$ for all $n = 1 .. N{-}1$.

A1 says that total profit is higher when more workers have control rights (due to higher productivity).

A2 says that profit per member falls as the size of the control group rises (diminishing returns to worker participation).

If the project is bad, E also chooses $n \in \{1 .. N\}$. However, profit is zero for any choice of n.

Here is the sequence of events.

1. Nature decides whether the project is good or bad. A good project occurs with probability θ. The true quality is revealed only to E.

2. E chooses a number of agents $n \in \{1 .. N\}$ to become members of the firm. This always includes E and may include another n-1 agents as well.

3. After observing E's choice of n, many uninformed workers bid for membership. E grants control rights to the n-1 workers offering the largest membership fees, with randomization in case of ties. These workers pay their fees, which become sunk.

4. Members other than E, if any, find out whether the project is good or bad. Each member (including E) receives $\pi(n)/n$ if the project is good and zero if it is bad.

Two kinds of equilibrium can occur: separating (SE) and pooling (PE).

Let n_g be the number of members chosen by a good entrepreneur (E_g).

Let n_b be the number of members chosen by a bad entrepreneur (E_b).

SE has $n_g \neq n_b$ while PE has $n_g = n_b$.

In a separating equilibrium, the good and bad entrepreneurs propose control groups of different sizes. If potential members observe n_g they know the entrepreneur is good. If they observe n_b they know the entrepreneur is bad.

In a pooling equilibrium, the two types of entrepreneurs propose control groups of the same size. Potential members must rely on their prior beliefs about project quality (θ).

A separating equilibrium always exists. In such an equilibrium, the entrepreneurs with good projects create KMFs. Those with bad projects try to sell membership rights but the equilibrium price is zero, because workers know that their projects are bad. A separating equilibrium eliminates the bad projects, but the productivity benefits that could have been obtained from worker participation in good projects do not occur.

Pooling equilibrium is more complicated. Here is what happens.

Fix the fraction of entrepreneurs who have good projects (θ).

For a given θ there can be more than one pooling equilibrium.

These pooling equilibria can be Pareto ranked, using the idea of Pareto improvements.

The worst pooling equilibrium for any given θ is essentially identical to the separating equilibrium and yields a KMF (the entrepreneur is the only person with control rights).

The best pooling equilibrium is the one that has the highest number of members. Call this Pareto efficient outcome $n^*(\theta)$.

There can also be intermediate pooling equilibria between these lower and upper bounds.

Now consider how variations in θ will affect the Pareto efficient outcome $n^*(\theta)$. For the moment I will ignore the fact that there are also inefficient pooling equilibria.

When the average project quality θ is sufficiently low, workers are not willing to pay much for membership. There is a unique pooling equilibrium with $n^*(\theta) = 1$. This implies that a good entrepreneur creates a KMF.

As average project quality rises, workers become willing to pay more for membership. The entrepreneur captures a larger fraction of the productivity benefits resulting from worker participation and offers membership to more workers. This increases $n^*(\theta)$.

If the probability of a good project is high enough, the entrepreneur offers control rights to all workers. Then we have $n^*(\theta) = N$ and the firm becomes a full-fledged LMF.

BUT: now return to the problem of multiple equilibria.

Even when there is a pooling equilibrium that leads to an LMF, there is also a separating equilibrium that leads to a KMF: an entrepreneur with a good project hoards information about the production technology, tells workers what to do, and obtains all the profit. The productivity gains from worker participation are lost.

Furthermore, there are generally multiple pooling equilibria. The worst of these (from a Pareto standpoint) is the same as a separating equilibrium with a KMF. Others will have some degree of worker participation, but not as much as a full LMF.

So even if adverse selection is not very important and a pooling equilibrium leading to an LMF does exist, we cannot take it for granted that this particular outcome will occur.

This illustrates a more general point about adverse selection models: there can be more than one equilibrium, and the existing equilibrium may not be Pareto efficient.

<u>The Plywood Cooperatives</u>

The plywood cooperatives of the U.S. Pacific Northwest have been among the most intensively studied labor-managed firms.

These firms gradually vanished as the plywood industry (both cooperatives and conventional firms) declined across the region in the late twentieth century.

But for half a century the coops competed successfully with conventional rivals and compared favorably with respect to productivity.

About 20 plywood cooperatives were formed in the 1940s and early 1950s. This new entry occurred during a post-war boom in housing construction and was stimulated at least in part by an expectation of rapid capital gains on membership shares.

The new cooperatives were often organized by outside promoters who knew little about the industry and had no intention of working in a plywod mill.

Two such efforts resulted in criminal trials for securities fraud and mail fraud, at which the promoters received prison terms of seven and twelve years. Around this same time the formation of new plywood cooperatives came to an abrupt halt, with no known entry by coops after 1955.

Several points in this story are of interest.

(a)   Both LMFs and KMFs entered the industry in large numbers prior to 1955, and
        the LMFs were clearly able to compete effectively against KMFs.

(b)   Entry of new LMFs stopped after 1955, although the previously created LMFs
        survived and prospered for many decades afterward.

(c)   Entry of KMFs continued unabated (about 90 new conventional plywood mills
        were established in the region during 1956-1972).

These events strongly suggest that LMF entry did not stop due to any inherent defect in
LMFs themselves, or any dramatic change in the industry as a whole.

A more plausible explanation is that the widely publicized instances of fraud in the mid-
1950s altered the beliefs of potential LMF members.

Despite economic success for existing LMFs, potential members could no longer assume
that the entrepreneurs responsible for creating new LMFs were trustworthy.

Once it became known that some entrepreneurs had bad projects, entrepreneurs with
good projects could not persuade workers to pay up front for membership rights. A
pooling equilibrium that had supported LMF entry collapsed, and was replaced by an
equilibrium where all firms were organized as KMFs. The entry of labor-managed firms
was sensitive to information conditions, while the entry of conventional firms was not.

Conclusion

The model helps explain the low rate of LMF formation, even by wealthy entrepreneurs who face no capital constraints and even if LMFs have higher productivity than KMFs.

Nothing in this story requires limited worker wealth or capital market imperfections. Workers could be wealthy enough to buy LMF membership rights at their true value.

Also, nothing in this story requires worker risk aversion. I assume that everyone is risk neutral so there are no diversification issues.

Of course, workers could be poor, or they could be risk averse, and those factors might also help explain why LMFs are rarely created.

But adverse selection in LMF membership markets could play an independent role and it might be at least as important.

If we think this story is part of the reason for the rarity of LMFs, and we think LMFs at least sometimes have productivity advantages, we might be interested in public policies that help to deal with the adverse selection problem. For example, we might think about some type of government regulation to reassure workers that their membership payments will be refunded if the entrepreneur's project turns out to be bad. We might also ask how Mondragon and the Lega group solved problems of this kind.

Econ 426W

Greg Dow

November 23, 2021

Lecture Notes on Chapter 11

These notes cover the entire chapter, and attempt to pull together the theoretical aspects of the book. I'll start with the big picture and then proceed section by section.

The Big Picture.

Can we construct a theoretical framework that explains a broad set of observations about labor-managed firms?

For example, we would like to explain

(a)   why LMFs are rare in an aggregate sense
(b)   why LMFs are more common in some industries than in others
(c)   why they respond to market shocks in ways that differ from conventional firms
(d)   why they seem to have goals other than profit maximization (e.g. employment)
(e)   what we know about their productivity
(f)   why they tend to have more wage compression than similar conventional firms
(g)   what we know about their rates of formation and survival
(h)   what we know about membership markets
(i)   why LMFs are sometimes transformed into KMFs and vice versa
(j)   what we know about LMF investment behavior
(k)   why LMFs tend to form in clusters.

This is a lot to explain. It is not clear that any single theory can explain everything.

However, a theory that can explain many things is more persuasive than a theory that can only explain a few things.

We want as much theoretical unification as possible (good theories should be powerful).

Chapter 11 seeks to develop a unified economic theory of the labor-managed firm.

My strategy will be to combine several existing theories and embed them in a larger theoretical framework based on alienability.

I will discard other theoretical ideas that don't fit easily into this framework.

Classification of theories about LMF rarity.

(At a minimum, we need to explain this basic fact.)

There is the set of all possible theories.

Within this, there is the set of all economic theories.

Within the set of economic theories, there is the alienability theory.

There are other economic theories that don't involve alienability.

These often involve positive externalities or "density dependence" among LMFs.

(a)   The rarity of LMFs is due to lack of familiarity with them.

(b)   There are positive spillovers among LMFs (which lead to clustering).

(c)   There are macroeconomic externalities that discourage LMFs.

All of these have the same general structure:

Because LMFs are rare, the incentives to create new LMFs are weak.

But if we had many LMFs already, the incentives to create new ones would be stronger.

Maybe there are additional economic theories that do not involve alienability?

There are also non-economic theories based on institutions, history, culture, and so on.

My view is that these other candidate theories may explain a few things, but not the full range of observations we would like to explain.

They are not "powerful" or "unifying".

<u>The Skeptic's Question</u>.

A significant number of economists who work on the topic believe that LMFs have some economic advantages relative to KMFs.

For example, people frequently argue that LMFs are better than KMFs because

(a)   They can rely on mutual monitoring and thus require fewer supervisors

(b)   They lead to less workplace conflict between capital and labor suppliers

(c)   They encourage workers to share information with managers

(c)   They encourage investment in firm-specific human capital

There is some supportive evidence with respect to productivity and survival comparisons.

Aside from these economic issues, advocates often emphasize values such as democracy, equality, and community.

But a skeptic would ask:

"If LMFs are so great, why are they so rare?"

LMF advocates often ignore this question but they should take it seriously.

I think a reasonable answer is to say that although LMFs may sometimes have higher productivity levels and higher survival rates once they are created, there are barriers to the creation of LMFs and the conversion of KMFs into LMFs.

This leaves open the issue of whether public policies could be used to encourage LMF formation, and whether the benefits would exceed the costs.

I tend to think that in some areas of the economy the answer is 'yes', but such policies need to be based on good theory, good evidence, and good organizational design.

Many countries currently subsidize ESOPs and profit sharing. So it is not a strange idea to subsidize LMFs. But does it make economic (or non-economic) sense?

11.1 The Causal Tapestry

Let's start from the definition of a firm: it has an authority structure.

Some person or group must have ultimate authority (there will be a control group).

Capital suppliers and labor suppliers are obvious candidates for this role.

There is a major difference between K and L: *alienability*.

Non-human assets can be easily bought and sold by individuals or groups.

Human assets (talents, skills, experiences, time endowments) cannot be bought and sold.

This difference in alienability implies differences between KMFs and LMFs.

I will argue that the most important differences arise through three causal mechanisms:

(a)   Credible commitment by controllers to non-controllers (about future actions)

(b)   Composition of control groups (size, heterogeneity, information)

(c)   Commodification of control positions (stock markets versus membership markets)

I will also argue that together these differences explain many of the facts about LMFs (but maybe not all of them).
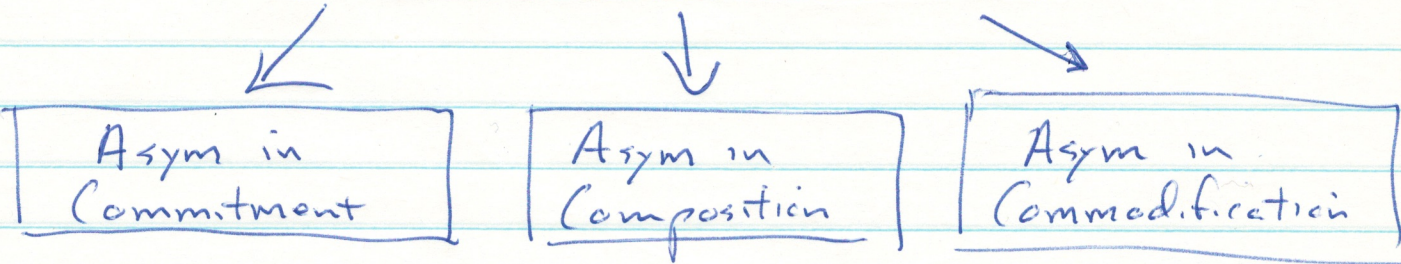
Reminders:

We need to respect the symmetry principle and the replication principle.

We also need to consider market imperfections because

(i)   Complete contracts imply we don't need authority structures at all; and

(ii)   Perfect competition implies KMFs and LMFs both maximize profit.

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┌─────────────────────────────────┐
│   Asymmetry in Alienability     │
│        for K and L              │
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     ↓            ↓            ↘
┌──────────┐ ┌──────────┐ ┌────────────────┐
│ Asym in  │ │ Asym in  │ │ Asym in        │
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│ Asym in Creation,       │
│ Transformation, and     │
│ Survival of             │
│ KMFs and LMFs           │
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│ Asym in Population Size  │
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Section 11.2 studies the problems that KMFs have in making credible commitments to workers.

Section 11.3 studies the problems that LMFs have in making credible commitments to investors.

I assume different people are endowed with K and L, so a KMF has to attract labor and an LMF has to attract capital.

In each case, we use game theory ideas to think about strategic behavior.

Section 11.4 considers differences in the composition of control groups.

Section 11.5 considers differences in commodification of control positions.

I will not address sections 11.6 and 11.7 in these notes. They should be relatively self-explanatory.

11.2   Credible Commitment by Capital to Labor

I will discuss why KMFs have trouble making credible commitments to labor suppliers.

There is not much evidence that LMFs have problems with productivity.

They may even have productivity advantages in some cases.

Here I want to flip the question around and ask why KMFs might have productivity disadvantages.

Within a KMF, there are chronic conflicts of interest between capital and labor.

At a given wage rate:

(a)   K wants more output, higher quality, more effort, lower costs etc.

(b)   L wants better working conditions, more safety, less effort, less supervision etc.

Very short run.

Under routine conditions, these issues get worked out on a day-to-day level through some equilibrium in a repeated game.

Such games have many equilibria, and efficiency is determined by social convention or organizational culture. In some firms, productivity is low; in others, it is high.

Because the interactions between K and L involve a flow versus flow (time and effort vs. wages and working conditions), deviation from prevailing social conventions by one side is likely to be detected and punished quickly by the other.

Short run.

Now suppose the firm's management is considering a significant change in technology or organization but without altering the compensation packages (wages) of the employees.

Such decisions are less frequent, tend to involve more information asymmetry, and have higher stakes.

Lack of trust may derail good projects that require worker cooperation. Workers may be unwilling to share information if they are worried that it will be used against them later.

<u>Long run</u>.

Next suppose the firm's management wants to renegotiate the compensation package for the employees (wages, benefits).

This is clearly redistributive. There may be large information asymmetries about the true financial condition of the firm. Workers may be suspicious about claims that wage cuts are necessary in order to preserve jobs.

Under these conditions, a KMF may need to signal that financial conditions truly are bad by laying off some employees. This would be costly to a financially healthy firm, so it is a credible signal that the firm is in trouble.

Lack of long run job security in KMF may imply that it is hard to get a good equilibrium in the repeated game between K and L. For example, less investment by L in specialized skills because workers discount future payoffs.

<u>Very long run</u>.

I define this to mean end game scenarios involving mass layoffs, plant closures, possible bankruptcy. In situations like this, there is no more repetition of the game and minimal concern about preserving reputations.

Shutdown decisions by K may not internalize losses to L involving rents or quasi-rents.

There can be collective action problems for L in protecting jobs, employee buyout, etc.

<u>Question 1</u>: Which of these problems (VSR, SR, LR, VLR) can be avoided by LMFs?

<u>Question 2</u>: Can a KMF imitate the LMF's solutions? (replication principle)

11.3   Credible Commitment by Labor to Capital

I will discuss why LMFs have trouble making credible commitments to capital suppliers.

Capital is a stock and labor is a flow. Firms can own K but not L (alienability).

Limited worker wealth may mean LMFs have financing problems that KMFs don't have.
I will assume workers can't finance an LMF out of their own savings.

It may be difficult to convince outsiders to supply assets or funds now in exchange for
promises of payment later.

This could occur either due to information asymmetry (adverse selection, moral hazard)
or problems with the enforcement of contracts.

Possible ways for an LMF to acquire capital:

Leasing. Suppose the LMF leases a non-human asset. The asset owner can monitor how
it is used, and take it away if it is not properly maintained (flow of capital services versus
flow of payments). But monitoring might be costly or unreliable, and rapid depreciation
might be possible. Leasing can have other problems: adverse selection, costly bargaining
over quasi-rents, etc. So there are various reasons why firms might need to own assets.

Debt. If the LMF must own non-human assets, it can go to the bank and ask for a loan.
But the lender can lose both principal and interest if a loan is not repaid. This could be
worse than just losing the rental payments while retaining ownership of a leased asset. Is
there good collateral? Maybe not. If collateral is imperfect, may need to monitor what L
is doing with the funds from the loan. Again monitoring may be costly or unreliable.

Equity. If outside investors provide the LMF with equity capital, funds are not linked to
any particular asset and there is no collateral. By definition an LMF can't give control
rights to K suppliers, so investors have no voting rights. Why would L pay dividends?

In all three cases, contracts may provide some protection for K suppliers.

Repeated transactions may also help, but transactions may be rare (unlike the L market).

Once a firm has started up, it may be able to finance further investment through retained
earnings without going back to the K market.

Reputation may be a weak safeguard if the LMF doesn't need further transactions.

What about symmetry? Why doesn't the KMF have parallel problems hiring labor?

Answer: the KMF does have similar problems but the intertemporal structure is different.

A KMF acquires a flow of labor services in exchange for a flow of wages.

An LMF acquires a capital stock now in exchange for a flow of payments later (if leasing is not practical and the firm must own non-human assets).

The resulting temptation to break promises may be greater for an LMF (entire present values are at stake, not just flows of services or flows of payments).

Summarizing sections 11.2 and 11.3, the tradeoff seems to be:

A KMF has conflict with L at a chronic low level, and this may reduce its productivity below what an LMF can achieve. Under normal conditions, this conflict can be kept within reasonable bounds.

But an LMF has conflict with K at the set-up stage and when outside funding is needed for expansion. This may keep LMFs out of the game entirely.

What observations can be explained by the credible commitment mechanism?

LMFs are rare in capital-intensive industries (have to transact with outside K suppliers)
LMFs are rare when leasing is problematic (need more start-up capital to own assets)
LMFs are rare when specialized or intangible non-human assets are important (these provide poor collateral)

But also: LMFs often have good productivity performance when they do exist (explains favorable evidence from econometrics and survival rates)

There are also design implications. LMFs will try to rely on fees paid by members, loans from members, and internally generated earnings.

Ideally, they own a bank (Mondragon, Lega). This reduces conflict between individual LMFs and their capital suppliers.

Question 3: Does it seem likely that the LMF's problem in making credible commitments to K is "larger" than the KMF's problem in making credible commitments to L?

Question 4: Does it seem likely that this can explain why KMFs are common and LMFs are rare?

11.4   Composition of Control Groups

Are there systematic differences between KMFs and LMFs with respect to

Size of control groups?

Heterogeneity of preferences within control groups?

Information available to control groups?

Do such differences have effects on rarity of LMFs, types of industries in which they appear, the life cycles of firms, or the design of firms?

1.   The size of control groups.

Based on inalienability of labor, LMFs need to have control groups that are roughly the size of the firm's workforce.

Based on alienability of capital, KMFs could have control groups that are small if the individual capital suppliers are wealthy enough. But in practice, may need to be large when large amounts of capital are needed and/or investors want diversification.

For the latter reasons, some large firms can have more shareholders than employees.

What difference does this make?

(a)   A large control group may find it difficult to make collective decisions.

(b)   A large control group may face free rider problems, especially in monitoring managerial performance.

This free rider problem may be less problematic in an LMF if there are fewer labor suppliers than capital suppliers.

Thus the composition of the control group need not always favor KMFs, although if the KMF has relatively few investors, it could have an advantage.

2.   The heterogeneity of control groups.

What determines this in LMFs? The range of skills needed, recruiting methods, sorting opportunities across firms for workers with diverse preferences.

What determines this in KMFs? Whether capital mobility, divisibility, diversification, or sorting opportunities lead to unanimity among the investors who control the firm, despite possible differences in their time preferences, risk attitudes, or beliefs about the future.

These are complicated issues, but one can argue that high mobility of financial K leads to unanimity in KMFs, while low mobility of L leads to preference heterogeneity in LMFs.

What difference does preference heterogeneity make?

(a)   Transaction costs of collective choice (voting cycles, bargaining costs).

(b)   Stability of control structure: maybe easier for investors to take over LMFs than for workers to take over KMFs.

(c)   Maybe better provision of local public goods like working conditions in LMFs.

3.   <u>Information available to members of control groups</u>.

A large KMF could have many shareholders, each of whom knows relatively little about the firm's technology, market environment, or what managers are doing.

In a similar LMF, members could get information about technology or markets through work activities, which might be helpful for productivity.

LMF members may also have information about managerial performance, and replace incompetent managers.

What observations can be explained by control group composition?

LMF rarity (in cases where preferences are diverse and collective choice is costly)

LMFs are more likely to arise in industries without large scale economies and where most members have similar skills (worker cooperatives, professional partnerships)

LMFs may be prone to investor takeover, while on the other hand it may be difficult to organize buyouts of KMFs.

LMF design may involve screening of members to ensure preference uniformity, use of representative democracy, constitutional rules to avoid problems with majority voting, delegation of decisions to managers.

Question 5: How important is control group composition in explaining LMF rarity?

Question 6: Assuming it is important, what are the key mechanisms involved?

11.5   Commodification of Control Rights

Suppose we have an LMF with no membership market.

A lot of people would predict the following outcomes:

(a)   Peculiar comparative static behavior (due to Illyrian firm issues)
(b)   Too little investment (due to horizon problem)
(c)   Members who leave tend to be replaced by hired employees (degeneration)
(d)   Founders of the firm may sell out to investors upon retirement

The symmetry principle requires that we ask: why don't KMFs have parallel problems?

The answer I propose: due to differences in alienability, it is easier to treat control rights
        as a marketable commodity in a KMF than in an LMF.

Specifically: in a stock market it is possible to transfer ownership of K, voting rights, and
        rights to receive dividends on equity shares without any change in physical inputs.

But the replication principle requires that we ask: why can't LMFs replicate the solution
        used by KMFs? Why not replicate stock markets using membership markets?

The answer is that in a membership transaction, it is necessary to change the physical
        inputs of the firm. If a new person gets control rights, they also supply labor.

This has numerous implications such as

(a)   Bargaining costs (labor turnover is relatively infrequent, workers could have
        specialized skills, so membership markets may not be perfectly competitive)
(b)   Might need separate membership markets for workers with distinct skills (not
        perfect substitutes due to differences in occupation, training, and experience)
(c)   Lack of liquidity (it can be hard to convert membership rights into cash)
(d)   Adverse selection (either about firm quality, worker quality, or both)

Adverse selection may prevent entrepreneurs from using membership markets to capture
        rents from creation of new LMFs (even if they would have high productivity).

Similar adverse selection problems can arise if employees consider buying out a KMF (in
        addition to free rider problems with organizing a large coalition).

What observations can be explained by commodification issues?

Low LMF birth rate and few conversions of KMFs into LMFs (due to adverse selection).

Comparative static rigidity in LMFs (less elastic output supply and input demand curves due to imperfect membership markets).

Low LMF investment rates (or constitutional rules to maintain high investment).

Degeneration of LMFs (or constitutional rules to limit use of non-member labor).

Design issues: how to compensate members when they leave? How are replacement members chosen?

Question 7: How important is commodification in explaining the rarity of LMFs?

Question 8: Assuming it is important, what are the key mechanisms involved?

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Now that we have seen the specific causal mechanisms in sections 11.2-11.5:

Question 9: Are there important observations we have not explained?

Question 10: Does alienability provide a coherent theoretical framework?

Question 11: What are the most important areas where more theoretical clarity is needed?

Question 12: What are the most important areas where more empirical research is needed?

Econ 426W

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Lecture Notes on Chapter 12

These notes cover all of chapter 12, which addresses policy issues. I focus quite a bit on sections 12.1 and 12.2, with shorter discussions of the other sections.

12.1   Practical Considerations

Suppose we wanted to have more labor-managed firms. What would be a sensible public policy strategy for achieving this goal?

At this point in the course:

(a)   We have seen examples of real LMFs and some empirical evidence about them.

(b)   We have a theoretical framework that attempts to explain why they are rare.

(c)   We have some ideas about economic efficiency and market imperfections.

Our theory says that a key factor in explaining the rarity of LMFs is the inalienability of labor. There is not much we can do about that.

But our theory also says that market imperfections must play a role (without some kind of market imperfection, KMFs and LMFs would behave identically).

Maybe public policy can correct market failures that currently limit the number of LMFs (in much the same way public policies are routinely used to deal with problems involving monopoly, externalities, public goods, informational asymmetry, and so on).

If you want more LMFs, the best raw materials are probably KMFs.

In particular, you might look for cases whether there would be productivity benefits from converting KMFs into LMFs.

If it is possible to arrange an employee buyout that makes most workers better off while making most investors no worse off, this is a Pareto improvement (roughly speaking).

So we would be passing a basic efficiency test. We might not be able to guarantee this in every case but it is an important consideration.

Guidelines for policy design (suggested by Dow).

1. Avoid major wealth redistributions. This is not because I am opposed to wealth redistribution in general (in fact, I believe wealth taxes and inheritance taxes are good things). My point is just that I don't want to get this goal mixed up with the goal of creating more LMFs. Two main reasons:

    (a) I want to promote LMFs using policies that are politically feasible (i.e., would not generate intense opposition from rich people), and
    (b) I want to know whether such policies can pass a Pareto improvement test (so in principle, few people would become worse off).

2. Build on existing real-world models (such as plywood coops, Mondragon, Lega, ESOPs, codetermination, previous examples of employee buyouts, etc.).

    (a) They have already been tried and have known strengths and weaknesses.
    (b) They provide strategies that can be used to achieve incremental progress.
    (c) Successful innovations often involve recombination of existing ideas.

3. Be realistic about self-interest.

    (a) Any policy is likely to be met with strategic behavior by K, L, and M (where M = managers).
    (b) Outsiders have limited ability to get information or enforce contracts.

4. Take theory into account. Use what we know, even if some of it is tentative.

5. Be selective about targets. It is unlikely that there is a single answer to questions about relative productivity of KMFs versus LMFs. The answer probably depends upon the specific firm and industry. Design policies where an LMF is created if it would have relatively high productivity, but not if it would have low productivity.

<u>My approach</u>.

I do not focus on biases against LMFs at birth. Fixing this problem seems hard (although I will make a few comments on it later).

Instead I assume KMFs already exist and think about how to convert some of them into LMFs. This is a strategy for increasing the overall population of LMFs.

I focus on KMFs that have publicly traded shares (this is the easiest case because there is a market price for the shares).

But there may be good candidates among closely held KMFs too. I don't want to rule out conversions of such firms. However, the policy proposal would require some adjustment.

<u>Note</u>:

No one has to agree with my policy proposals in chapter 12.

They are intended partly as a thought experiment: what issues would arise if . . . ?

I will try to highlight potential problems and indicate the nature of potential solutions.

You may or may not find these arguments persuasive.

12.2   A Modest Proposal

There are three main components to my policy proposal:

1.   Labor trust (a bit like ESOPs)

2.   Labor directors (a bit like codetermination)

3.   Labor shares (a bit like plywood coop membership markets)

A key thing we learn from Mondragon and the Lega is the potential value of a federation that includes multiple LMFs. I'll come back to this later.

The labor trust.

This is a legal entity controlled by the employees of a firm. It uses funds obtained from payroll deductions to buy shares of the firm on a stock market.

The simplest method is a flat percentage of each employee's earnings (maybe 5%).

The labor trust gradually accumulates shares owned collectively by the workforce.

Dividends on the shares owned by the labor trust are the same as dividends paid on shares owned by outside investors.

Such dividends are reinvested in the labor trust, not paid out in cash to employees. They are used to buy up more shares of the firm.

The labor directors.

These people manage the labor trust. Employees choose them democratically.

Voting is based on one person, one vote. Votes are not proportional to the size of the contributions individual employees make to the labor trust (we are trying to create an LMF, not a KMF).

There might need to be some kind of proportional representation for various employee groups (production people, marketing people, administrative people . . .) to ensure that the labor trust is not dominated by directors from a single large group.

The overall board of directors for the firm as a whole is divided into two groups, those chosen by the employees and those chosen by the outside investors.

The directors of the labor trust are also the employee representatives on the overall board of directors. The investor representatives are chosen in the usual way.

There is a constraint: employees receive a number of seats on the overall board that is proportional to the fraction of total equity shares held by the labor trust.

Because the labor trust accumulates more shares over time, the labor directors will be a growing fraction of the total directors over time. If the labor trust eventually owns all of the equity shares, at that point all of the directors of the firm will be labor directors, and we will have a full-fledged LMF.

The labor shares.

The shares accumulated by the labor trust are conventional equity shares (what people buy and sell on stock markets).

In addition, each employee gets one labor share, and this has one vote attached to it.

Ownership of a labor share entitles a person to work in the firm, receive income from it, and vote for the labor directors.

A labor share must be transferred to someone else if an employee leaves the firm. There are several options on what happens to the employee's labor share in this case.

(a)   It could be sold directly by the departing worker to a replacement worker.
(b)   It could be sold directly as above, but subject to the approval of the labor trust.
(c)   It could be sold to the labor trust, and then the firm looks for a replacement.

I like option (c) best. We'll come back to this later.

<u>Referendum procedures</u>.

I don't want to impose the above policies on all firms. The idea is to give the employees themselves a choice about whether to establish a labor trust.

If the employees in a firm don't want to use the transition structure described above, that's fine with me.

This implies that the employees in a firm will need to vote on the question of whether they want to set up a labor trust and start buying shares in the firm.

Employees might vote no for several reasons:

(a)   They prefer consumption to saving.
(b)   They prefer to do their saving in a more diversified way.
(c)   They don't place much value on obtaining control rights.

My suggestion is that to trigger a referendum, there should be some minimum number of employees willing to sign a petition asking for a vote. The threshold could be something like 10%, 20%, or 30% of the total workforce.

There are tradeoffs: a higher threshold means that we avoid frivolous referendums with little chance of gaining majority approval, while a lower threshold means that organizers of a buyout face less severe free rider problems.

Assuming the petition requirement has been met, there is a time period during which the employees can debate whether or not they want to establish a labor trust.

Presumably we need government oversight to provide a neutral referee who ensures free speech, no retaliation by managers against employees who want a labor trust, availability of audited financial statements to the employees, and so on.

At this stage, the investors or managers may try to persuade employees NOT to create a labor trust, perhaps by offering higher wages or better benefits. I don't see any reason to rule out offers of this kind, but employees might want to think carefully about credibility issues when such promises are made.

<u>The set of affected firms</u>.

I would include all publicly traded corporations in the set of firms where employees have a right to create a labor trust (if they want to).

I would avoid arbitrary size cutoffs (like some minimum number of employees) because this may encourage strategic behavior by investors or managers to avoid a referendum.

In principle, privately held corporations might also be included, but this requires separate rules about how to value the firm, how to trigger a referendum, and so on.

I would not include proprietorships or partnerships with unlimited liability in the set of eligible firms. These tend to be small, they have frequent employee turnover, and they have more difficult firm valuation problems.

Another reason to omit these firms is to maintain incentives for creation of small KMFs. It is only after a KMF becomes a limited liability corporation with publicly traded shares that the possibility of an employee buyout becomes relevant.

One way to think about my proposal: entrepreneurs who are willing to sell shares to the general public should also be willing to sell them to employees, if the employees happen to be interested.

Potential pitfalls.

1.   Should not create individual capital accounts within the labor trust and allow the individual workers to sell off "their" shares if they feel like it. The problem is like a prisoner's dilemma game: each individual would like more diversification in the saving they do, but collectively they would sacrifice public goods such as ability to influence management, raise productivity, or improve working conditions. The employees should decide about greater diversification versus local public goods at the point when they vote in the referendum.   Everyone needs to understand that if a labor trust is created, it involves collective ownership, not individual ownership.

2.   Should not let retiring workers sell "their" equity shares back to the open market when they leave. This slows down the process of accumulating equity shares in the labor trust, and therefore slows down the conversion process, with negative externalities on the people still employed in the firm. It is true that compensation needs to be paid to workers who retire, but this should be done differently. In my view, the departing worker should sell her labor share to the labor trust, and then the labor trust should sell it to a replacement worker. We need to think carefully about how this would work in practice (see my remarks on section 12.5 below).

3.   Should not let the labor trust make cash payments to existing members (e.g., the dividends on the shares it holds). Again this slows down the conversion process and imposes negative externalities on other workers. Employees should think about the tradeoff between consumption and saving when they are voting in the referendum. Once the labor trust exists, employees get a payment from it when they leave the firm, but not before.

The above issues involve conflicts between private and social benefits. It is necessary to have some government regulation specifying the rules under which a labor trust operates.

Remarks on Pareto efficiency.

Because employees have different preferences, some will vote yes in a referendum and some will vote no. If the majority votes yes, a minority of the workforce becomes worse off when the labor trust is created. So we are not really getting a Pareto improvement in the strict sense that no one becomes worse off.

We need to think about the efficiency question in a more aggregate way: would a buyout make employees "as a group" better off? A majority vote is a reasonable procedure, but it is only an approximate way to assess whether the employees will have aggregate gains.

Because the labor trust is buying shares on a stock market at the current equilibrium price and these transactions are voluntary, we don't have to worry about whether any individual shareholders are made worse off. But we do have to ask whether shareholders as a group become worse off (see my discussion of section 12.3 below).

A few more issues.

1. Why not have higher percentage payroll deductions for higher income workers?

    This might seem fair, but it may create conflicts among employees. It may also complicate the transitional processes where we line up the relationship between dividends and wages. I won't go into details here (this is discussed in the book).

2. Why should workers have to supply capital in order to gain control?

    Two points: in the long run, the firm will become an LMF so this is a transitional issue. Also, by having employees supply capital we ensure that existing investors are compensated when they depart from the firm.

    The downside is that we are requiring collective capital ownership by the LMF. This may put employee buyouts out of reach for low-income workers or for the employees of capital-intensive firms.

    The alternative is just to transfer control rights from capital to labor without any compensation to the existing shareholders. I think such a policy would probably have highly undesirable consequences. You might want to consider what would happen if we tried to do this.

3. What if workers can't afford to contribute to a labor trust?

    We could think about having government subsidies for the process of buying up equity shares. Many countries already subsidize employee stock ownership, so this would not be a completely new idea.

    What would be the justification? You could argue that there are efficiency gains for the economy as a whole (see below); or you could argue that other normative goals like democracy, equality, and community are important and worthy of some government support.

Efficiency arguments.

One question you might want to consider is whether the conversion process I describe in chapter 12 actually solves any market failure problem.

A skeptic might say that workers can already buy out KMFs if they want to, and if there are large enough productivity gains to make it worthwhile. Why do we need labor trusts, labor directors, and labor shares? Why have a referendum process?

I think the key issue is that conversion of a KMF into an LMF can potentially provide a set of public goods to the employees. It doesn't make sense for any individual worker to buy up shares in order to get control rights. The benefits from workers' control will only arise if a large set of workers buys up shares simultaneously, and acquires enough control to influence firm decisions as a group.

The referendum procedures are meant to address these public good issues. The decision to impose a payroll deduction in order to obtain control over the firm is similar to voting about whether to tax ourselves to provide public goods through governments.

You might agree with this idea, but still be unsure about whether there is any efficiency reason to use public funds to subsidize an employee buyout.

A supporter of LMFs might make the following points.

1. There are informational asymmetries in the capital market (adverse selection, moral hazard). These problems make it difficult for workers with low wealth to finance employee buyouts, even if a firm would be more productive as an LMF.

2. There are commitment problems when workers need capital to finance a buyout and promise to repay it later. Governments can compensate investors or lenders for taking on the risks associated with default by employees. Governments can also enforce repayment in ways that cannot be duplicated by the private sector.

3. Due to the inalienability of labor, employees cannot borrow against their future labor income (or use human capital as collateral). Governments often subsidize student loans, and maybe they should subsidize employee buyouts too.

4. There are free rider problems with employee buyouts. The benefits from a buyout are widely dispersed among the workforce but the costs are concentrated on a few people who do the research, get everyone else organized, and so forth. A subsidy can help to compensate for this free rider problem.

5. There are also informational and bargaining problems with employee buyouts. It is hard to know the preferences of other workers, what they are willing to pay for control rights, and so on. A subsidy can help to compensate for these problems.

The market failures listed above suggest that we may have too few LMFs relative to their productivity potential. There are likely to be some KMFs that would be more productive as LMFs, but due to market failures, no buyout occurs. Subsidies for the transformation of KMFs into LMFs might therefore improve economic efficiency.

Safeguards.

The preceding argument is based on the assumption that subsidies can be targeted on the subset of KMFs where potential gains from conversion exist.

We don't want to convert KMFs into LMFs when this would decrease productivity by a substantial amount. We need to be selective. This is hard because an outside observer may be unable to predict the productivity effect of an employee buyout in a given firm.

A number of safeguards are built into the policy proposal in chapter 12.

1.   There are restrictions on the set of eligible firms. In particular, small firms that are not organized as limited liability corporations are excluded. This is based on the assumption that such firms are unlikely to be good candidates for conversion.

2.   There are hurdles to holding a referendum (a minimum threshold for the number of workers who want a transition). If most workers have no interest in the idea, there will be no referendum.

3.   Workers have to bear substantial costs of transforming the firm, and must vote on whether to have a transition at all. As we will see in section 12.6, it usually takes a considerable amount of time for workers to gain substantial control rights. This should help to screen out firms where productivity gains are small or negative, or where workers don't value control rights very much.

4.   Investors or managers could offer to compensate the employees for not pursuing a conversion. This might occur in situations where the KMF has high productivity but an LMF would have low productivity.

At the end of the day, it is really up to the employees to make judgments about whether a significant productivity increase is likely. If they believe this is true, they can spend their money on a buyout. If not, they can vote against it.

<u>Federations</u>.

Mondragon and the Lega indicate the value of having a large group of LMFs. We also have evidence from clustering that LMFs can benefit by having other LMFs around.

It might make sense to organize employee buyouts in such a way that the resulting LMFs can form some kind of federation, with certain specialized institutions.

For example, it might be a good idea to have a financial institution like a bank to support the individual LMFs.

It might also be a good idea to have a central agency that provides consulting services to individual LMFs. There are usually scale economies in the supply of information, and an agency of this kind provides opportunities to learn from experience.

Federations can deal with risk issues by pooling income among LMFs or by shifting labor from one firm to another when shocks occur.

Federations can accumulate resources to finance additional employee buyouts, or provide a cushion during a recession.

Federations often start new LMFs from scratch. This is probably the most promising way to deal with the low birth rate for LMFs. In particular, federations can help solve adverse selection and rent appropriation problems arising at the formation stage.

12.3   Reassuring Shareholders

According to the theory developed in chapter 11, there are certain difficulties that will predictably arise if the buyout procedures of section 12.2 are implemented. I discuss these difficulties in sections 12.3, 12.4, and 12.5, along with possible solutions.

The first issue involves credible commitment to capital suppliers. At some stage in the process of transforming a KMF into an LMF, workers will gain majority control and the previous investors will lose it. Current shareholders will understandably be worried that they might become worse off when this occurs.

Protection of shareholder wealth during a transition is important for several reasons. The most important is that we want to preserve incentives for the creation and expansion of KMFs. This matters for economic growth (KMFs are by far the most common type of firm) and because the strategy in chapter 12 is to rely on KMFs as the raw material for the formation of LMFs.

Another consideration is that we want a way of expanding the LMF population that does not lead to large-scale political opposition from existing shareholders in KMFs.

And from a purely theoretical point of view, we are trying to figure out whether there are ways to obtain Pareto improvements by converting KMFs into LMFs. This requires that existing shareholders not become worse off (at least not in an aggregate sense).

The big danger, of course, is that once workers have 51% of the votes, they can behave in an opportunistic way toward outside investors, perhaps by raising wages at the expense of dividends, or using the firm's resources for disguised forms of worker consumption.

I will run through various reasons why such issues might not be too important in practice, or ways in which they could be addressed. You should think about how persuasive these arguments are (or how persuasive they would be to the shareholders in KMFs). Probably some are more persuasive than others.

1.   As long as K suppliers still have a voting majority on the board of directors, they don't have to worry. Our theory says that the investors agree among themselves (they all want the firm to maximize its stock market value), so when employees have ≤ 49% of the votes, there is no problem.

2.   After employees obtain ≥ 51% of the votes, they are still playing a repeated game with the shareholders. If employees might want shareholders to supply additional capital in the future, they should be nice to them.

3.   The shares held by the labor trust and the shares held by outside investors receive equal dividends. If workers raise wages at the expense of dividends, they will be lowering the dividends flowing into the labor trust. This has a cost to the workers

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by slowing down the rate at which they gain further control rights, and perhaps by reducing the compensation that will be paid to workers when they leave the firm.

4. In some situations, wages may be set through mechanisms that are exogenous to the firm (for example, collective bargaining at an industry-wide level).

5. Even if wages are determined within the firm, this issue can be taken away from the board of directors and handed over to a separate bargaining committee with equal representation of capital and labor suppliers (see the United Airlines case from chapter 10).

6. Employees who are retiring soon will care about the wealth they have saved up, including the compensation they will receive from the labor trust on their way out the door. If the labor trust has not yet achieved 100% employee ownership, this compensation is likely to depend in part on the market value of the firm's shares. These people are natural allies of the outside shareholders, and might think more like capital suppliers than labor suppliers.

7. As employees gain greater control rights and share ownership, productivity may rise, and some of the benefits may go to the existing shareholders via dividends.

8. Employee buyouts are not the only situation where minority shareholders can be vulnerable to exploitation by dominant owners or top managers. Similar dangers arise in a closely held KMF that has one owner with 51% of the shares plus a few other owners, or in a widely held KMF with many small shareholders. If firms of this kind do not abuse minority shareholders excessively, maybe firms bought out by employees won't abuse them too much either.

9. It is even possible that outside shareholders might benefit from having employees monitor the performance of top managers, and having them fire any incompetent manager who is reducing productivity at the expense of both K and L suppliers.

10. Our theory says that employees have heterogeneous preferences. This means they will not all agree among themselves about what the firm should do. Thus, even if employees have $\geq$ 51% of the votes, there may be some factions of the workforce who will agree with the outside investors on particular matters.

11. On certain issues that are crucial to the outside shareholders, it would be possible to require a supermajority (2/3 of the votes, or 3/4 of the votes). This is routinely done in conventional corporations for issues like mergers and acquisitions. Such supermajority requirements could be used to postpone the point at which workers can fully dominate the firm.

12. In order to avoid situations where the employees have 90% of the votes and a few remaining outside investors have 10%, one can require a discrete final transaction where all remaining shares are purchased simultaneously by the labor trust at their

current market price. This could be done by having the labor trust take out a loan, use it to buy up equity, and replace it with debt. The threshold for the last discrete transaction could be set at 80% employee ownership, 70%, or whatever.

In principle this mechanism could even be used as soon as employees achieve 50% share ownership, so we don't ever have a situation where outside shareholders are in a minority.

However, this assumes it is possible for the labor trust to take out a loan of the necessary size. If banks are worried about whether the loan will be repaid, we still have a problem with credible commitment toward capital suppliers.

One way to solve this problem is to have governments offer guarantees to private banks that the government will compensate the banks in situations where the firm defaults. Or alternatively, the government could make such loans directly and ensure that repayment by workers is enforced. This might be a more important role than simply subsidizing the purchase of shares by the labor trust.

Another way to solve this problem is to have federations of LMFs like Mondragon and the Lega where there is a bank that is internal to the federation, and can make loans that are used to finance the conversion of KMFs into LMFs.

12.4   Governing Firms

Our theory from chapter 11 tells us to watch out for collective choice problems when the control group of the firm includes employees.

Here are some potential solutions. Again, you should think about how persuasive these arguments are.

1.   Voting cycles can be avoided by using representative democracy, which is likely to result in bargaining within small groups (e.g. within the board of directors).

2.   Distributional conflict over wages can be reduced or avoided by giving the job of determining individual wages to a subcommittee, followed by a ratification vote involving the workforce as a whole. [Note: departments at SFU have committees that make salary decisions affecting individual professors. I know from personal experience that it is possible to have professors make decisions about the salaries of other professors without causing enormous conflict.]

3.   Proportional representation can be used to ensure that various employee groups (defined by occupation, location, product line, etc.) all have some representation in the governance of the firm. This reduces the danger that one dominant group will get its way on every issue.

4.   Supermajority rules or vetoes can be given to minorities on specific issues that are of particular concern to them. In effect, this forces people to achieve a bargaining solution where the minority is compensated in some way.

5.   Workers can be given open access to all relevant information, such as the firm's audited financial statements. Bargaining costs are lower whenever informational asymmetries are less significant.

6.   Decisions can be delegated to managers in order to avoid voting cycles or costs of bargaining within the control group. This puts the burden on the managers to find ways of pleasing at least 51% of the workers, but maybe they can do this.

7.   Constitutional rules can be used to deal with structural problems where majority rule might be a problem. For example:
        (a)   Mandatory minimum levels of re-investment to avoid horizon problems.
        (b)   Limits on the use of non-member labor to avoid degeneration problems.

8.   In general, I think it is a good idea to leave a lot of discretion to the designers of buyout proposals in individual firms. The people organizing the buyout can set up a governance system that seems well suited to a particular firm or industry and employees can make up their own minds about whether that system makes sense when they vote on whether to proceed with a buyout.

12.5   Trading Jobs

Our theory from chapter 11 suggests that we should think carefully about potential issues around commodification of control positions. This arises in connection with transactions involving the labor shares discussed in section 12.2.

1.   Market pricing might be used when new members join the firm. This reduces the severity of Illyrian and common property problems (see chapter 7). It is likely to work best in situations where there are many candidates who are qualified to do a given job. The firm can roughly determine the equilibrium price or entry fee by adjusting it until there is neither excess supply nor demand for firm membership.

2.   The firm can arrange for new members to pay the entry fee by deferred payments over a few years if these members cannot afford to pay the entire price up front.

3.   Compensation to departing members for the contributions they have made to past firm investments is important to avoid the horizon problem. Ideally this should be linked to some kind of market valuation of the membership position given up by the retiring member. For adverse selection reasons, it is a bad idea to allow the retiring member to sell their position directly to a new member. I think a better approach is to have the firm announce a guaranteed price at which it is willing to repurchase membership positions when people retire (this helps solve the liquidity problem) and then search for a new member who has the appropriate skills. The revenue collected from replacement workers should roughly offset expenditures for compensation payments to the departing workers.

4.   The firm may need to announce different prices for labor shares held by people with different skills, and it may need to alter these prices from time to time as a function of market conditions. The general idea is that the price of a labor share reflects the present value of returns on the firm's collectively owned capital, the firm's productive efficiency, any product market rents the firm may receive, and so on. For a worker in a particular job, it should reflect the present value of the income paid to that worker over time minus the opportunity costs to that worker (what they could have gotten in the outside labor market).

5.   How can the price of labor shares be determined in practice? Similar problems arise for the valuation of shares in closely held KMFs that are not listed on public stock markets, and for the valuation of positions in professional partnerships when a partner retires. Typically in these situations the value of a share or a partnership position is evaluated by an independent professional specialized in doing work of this kind. In the event of a dispute, arbitration mechanisms could be used.

6.   Government regulators could be useful in monitoring how these valuation systems operate, setting standards for auditing of the firm's accounts, accrediting valuation specialists, investigating and punishing fraud, and so on. Governments do similar things when they regulate ordinary stock markets.

12.6   Sample Calculations

I will not go into details about this section (the algebra is explained in the book). But I do want to provide an overview of the main conclusions.

My goal in this section is to make rough estimates about the amount of time it would take to achieve varying levels of workers' control using the payroll deduction plan discussed in section 12.2. For example, you might want to know how long it will take for workers to get 50% of the equity shares (and votes), or 67%, or 100%.

If these thresholds can be reached relatively quickly, the potential benefits from control rights might seem attractive to workers. But if it will take a very long time, workers are unlikely to be interested.

The answers depend on numerical assumptions about several key parameters: the fraction of each worker's pay that is diverted to the labor trust, the labor intensity of production technology, how much of the firm's capital stock is financed by debt versus equity, and the rate of return on capital.

My baseline calculations (shown in bold in each table) rely on the following assumptions:

The payroll deduction is 7.5% of worker earnings.
Of the firm's total value-added, 70% goes to labor and 30% goes to capital.
Of the firm's total capital stock, 50% is financed by debt and 50% is financed by equity.
The rate of return on capital is 10% annually (before taxes and regardless of whether it is financed by debt or equity).

The payroll deduction level is high but seems within reasonable bounds. I think the other figures are reasonable estimates for many North American manufacturing firms, although of course there are large variations across firms and industries.

Because actual numerical values could vary substantially, I check the sensitivity of the results to variations in each parameter, holding the other parameters constant at baseline levels. For example, I consider payroll deductions as low as 5% or as high as 10%; labor intensity as low as 50% or as high as 90%; an equity-financing fraction as low as 30% or as high as 70%; and a rate of return on capital as low as 5% or as high as 15%.

The effects of a government subsidy can be determined by thinking about changes in the level of payroll deduction. For example, if workers pay 5% and the government kicks in another 2.5%, then you can use the estimates for 7.5% to see the overall effect.

I want to emphasize that these calculations are extremely rough and rely upon numerous simplifying assumptions. However, I think they do reveal some factors that are likely to be important in practice.

Table 12.1 (p. 284). This table assumes dividends on shares held by the labor trust are reinvested to accumulate more shares. The baseline parameter values show that it takes 10 years to reach 50% workers' control, 12 years to reach 67%, and 15 years to achieve 100%. The growth process is non-linear due to the reinvestment of dividends. But even with the compounding of dividends, these are long time periods.

The most rapid rate at which workers' control is achieved occurs (not surprisingly) when the firm is highly labor intensive. If 90% of value added goes to labor and all of the other parameters are at baseline levels, it only takes 4 years to reach 50% worker control and it only takes 6 years to reach 100%. The reason is that workers as a group get a relatively large part of the firm's net income, so any given payroll deduction can be used to buy up equity shares relatively rapidly.

The only other factor that makes a substantial difference is a low equity-financing ratio (.3 instead of .5). This gets us to 50% workers' control in 7 years and 100% in 11 years. The reason is that if most of the capital stock is financed by debt, workers don't have to do as much saving in order to buy up the firm's equity shares.

Table 12.2 (p. 285). This table assumes dividends on shares held by the labor trust are paid out in cash to employees. As a result, the labor trust accumulates shares in a linear way rather than through exponential growth. This slows everything down; at the baseline parameter values it now takes 15 years instead of 10 to reach 50% workers' control, and it takes 29 years instead of 15 to reach 100% workers' control.

Somewhat surprisingly, however, it is still true that firms with high labor intensity (0.9) can get to 50% control in 4 years and 100% control in 8 years. Nothing else matters very much. Almost all other estimates in the table involve 10 years or more and several of the estimates involve very long time periods.

Table 12.3 (p. 286) does something different. Suppose that dividends are reinvested by the labor trust (so we do get the exponential growth effect), but departing workers have individual accounts and can sell off their shares on the external stock market when they leave. What happens is that we get a steady-state equilibrium where eventually the new shares being purchased by the labor trust are exactly offset by the old shares being sold back to the market by departing members.

The question is how much worker share ownership we will get in long run equilibrium. The answer depends on how long a typical worker remains in the firm. For the sample calculations, I consider three cases: the average worker remains 5 years, 10 years, or 15 years. It turns out that when the average worker only remains 5 years, the baseline case gives 12% worker ownership in equilibrium. There are no reasonable parameter values where we reach 50% worker ownership.

When the average worker remains for 10 years, the baseline case yields 26% employee ownership. The only case where we get more than 50% employee ownership is when the firm is highly labor intensive (0.9). In fact, this case leads to 100% worker ownership.

When the average worker stays for 15 years, the baseline case yields 75% worker share ownership. So it is possible to get majority workers' control, although not 100%. But if we deviate from baseline assumptions we can get to 100% in certain cases (a high enough payroll deduction, high enough labor intensity, low enough equity financing of the capital stock, or a high enough rate of return on capital).

It is probably not a coincidence that most U.S. firms with ESOPs tend to have employee ownership in the interval of 10% - 30%. I suspect that this reflects a tendency to have an equilibrium in this range when the employees have individual capital accounts that can be sold off when the employee leaves the firm.

I think the lessons from these calculations are pretty clear. If a payroll deduction system is going to have a realistic prospect of converting KMFs into LMFs, it is very important to reinvest dividends in further accumulation of shares. There must also be rules against individual capital accounts that allow employees to sell shares back to the market when they leave.

Even under these restrictions, payroll deductions are only likely to yield LMFs within a reasonable time frame if (i) the firm is labor-intensive and (ii) it is possible to finance a large fraction of the firm's capital stock through debt rather than equity. For example, it may be possible to satisfy condition (ii) if the firm uses general-purpose physical assets that serve as good collateral from the standpoint of a bank.

These conclusions should not be surprising given what we have seen earlier in the book. We already know that LMFs are more likely to arise when industries are labor intensive, and when debt can be used to finance whatever non-human assets the firm may need.

The last point in section 12.6 involves the market price of a membership share. Suppose we don't worry about imperfections in membership markets and just compute the present value of a membership position, which in a competitive market would be the equilibrium price of a labor share.

Under baseline parameter assumptions, we find that the price of a labor share is equal to 2.14 times the annual income of a worker. This is roughly the same as for the entry fees used by Mondragon during its early rapid growth, and a little lower than the price of the shares in plywood coops when they were at their peak value in the early 1980s.

For a highly labor intensive firm (0.9), the price is only about one half of a worker's annual income, so again we see that labor intensity makes it easier for workers to buy into an LMF. In a highly capital intensive firm (0.5), the price is five times a worker's annual income, because members have to finance a larger collective capital stock.

There are other factors that have various effects on the price of membership, which you can read about in the book, but clearly labor intensity is the big one.

12.7   <u>The Long and Winding Road</u>

I will not summarize this section. It is short and should be reasonably clear.