So far we’ve been thinking of firms as selling their product to consumers.

But it’s just as often the case that firms sell their product to other firms.

The relationship between a manufacturer and a retailer is very different.

One reason is the demand faced by a manufacturer on the price it sets, but also other factors it does not directly control.

The other reason is that retailers compete with each other.

This is because retailers care about the wholesale price it pays as well as the wholesale price paid by others.
This is because the whole sale price determines marginal cost and hence equilibrium profits.

These reasons motivate the study of vertical relations between firms, usually one manufacturer and several retailers.

We’ll see why the manufacturer may want to establish contractual terms that differ from per-unit constant cost contracts.

Consider a simple setting with a firm M and a firm R.

Suppose the demand for the final product by R is $D(p)$.

Regarding production by R, assume to produce one unit of output, R needs one unit of input.
- R has no costs except wholesale price $w$.
- M has constant marginal cost $c$.
- First consider the profit-maximizing solution when the two firms are vertically integrated.
- What the joint firm maximize is

$$\pi = (p - c)D(p)$$

- Now let the firms be vertically separated.
- Assume the contractual relation is the determination of $w$. 
Specifically, $M$ determines $w$ and $R$ chooses how much to buy.

$R$ will choose $p$ to maximize $(p - w)D(p)$.

To replicate the solution under vertical integration $M$ would have to offer a wholesale price equal to marginal cost.

But that would give $M$ zero profit, so $M$ would set $w > c$.

But then $R$ sets a price greater than $p^M$.

Note that sum of the two firms profits is lower than the profit under integration.
This is known as the double marginalization problem.

Now suppose that in addition to setting a wholesale price, the manufacturer can set a fixed fee $f$ that R has to pay if it wants to do business.

The pair $(f, w)$ will be a two-part tariff, where $f$ here is referred to as a franchise fee.

We will refer to this as a nonlinear contract.

Suppose $M$ sets $w = c$ and

$$f = (p^M - c)D(p^M)$$

This contract is efficient- it maximizes their joint profits.
The retailer sets price at $p^M$, and receives gross profits of $\pi^M$.

M receives 0 variable profit but recovers all profits through the franchise fee.

This takes us back to the vertically integrated setting.

Specifically, with nonlinear contracts, the optimal solutions are identical under vertical integration and vertical separation.

This conclusion is very specific to some assumptions we will want to relax:

One assumption is no competition at each stage- in fact with more retailers we won’t be able to attain monopoly profits again.
Another assumption we made was that of complete information—specifically that the manufacturer knew the costs of the retailer.

We’ll try to relax this as well, but it’s also worth noting that there are alternative vertical restraints, such as MRP which can result in optimal solutions.