

Development Economics

Slides 14

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The Parallel Lives of Land and Labor Markets

Imagine an agricultural society with many residents.

- Production uses just two inputs: **land** and **labor**.
- Our arguments carry over to several inputs.

The Parallel Lives of Land and Labor Markets

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- Our arguments carry over to several inputs.
- Two distributions of endowments:
 - Labor
 - Land

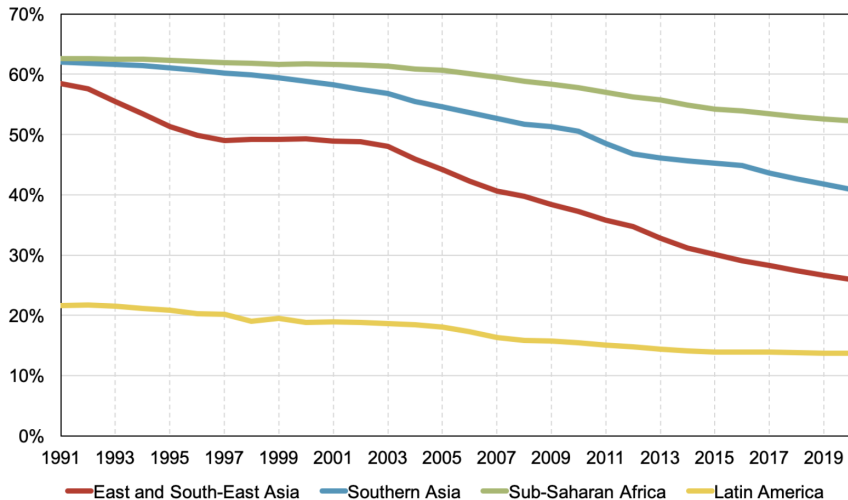
The Parallel Lives of Land and Labor Markets

Imagine an agricultural society with many residents.

- Production uses just two inputs: **land** and **labor**.
- Our arguments carry over to several inputs.
- Two distributions of endowments:
 - Labor
 - Land
- Typically, **the latter is distributed far more unequally than the former.**
- In the absence of any factor market, land will be cultivated with dramatically different labor-land ratios.

Taking Agriculture Seriously

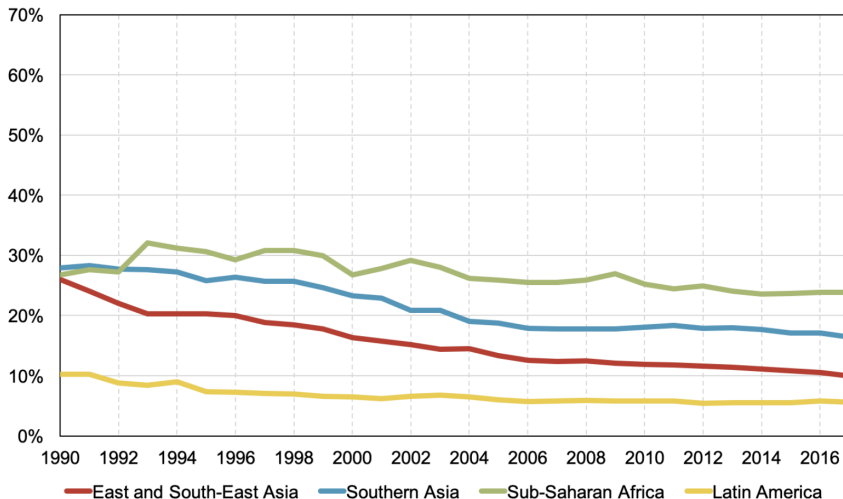
Employment Agriculture (% total employment)
World-Regions average, 1991-2020



Source: Bauluz-Govind-Novokmet (2020)

Taking Agriculture Seriously

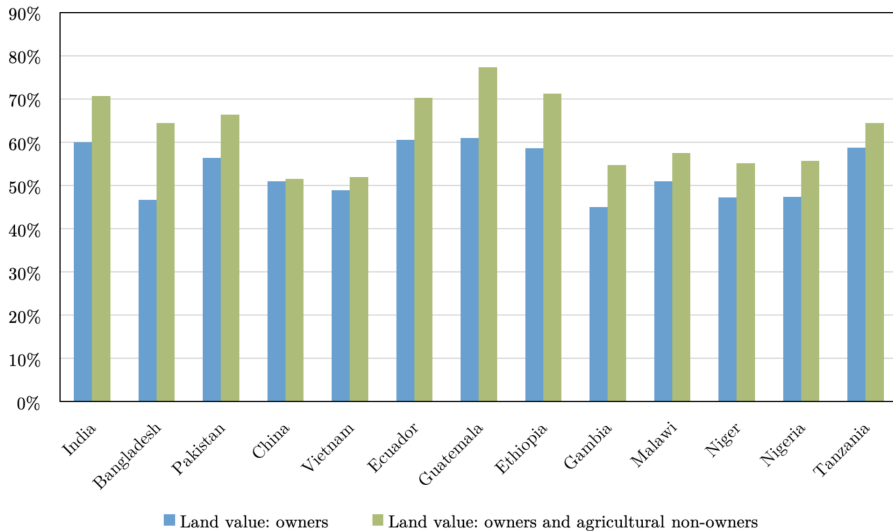
**Value Added Agriculture (% total Value Added)
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Land Inequality

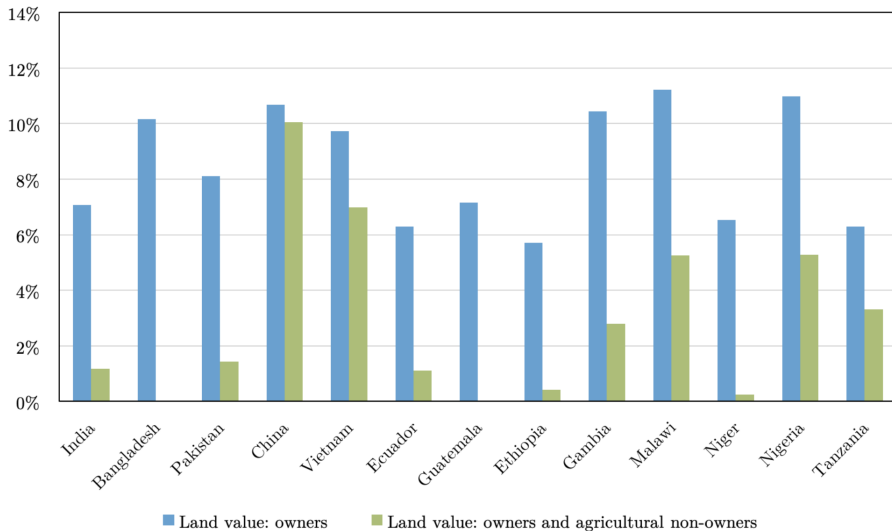
Top 10% shares, most recent year available



Source: Bauluz-Govind-Novokmet (2020)

Land Inequality

Bottom 50% shares, most recent year available



Source: Bauluz-Govind-Novokmet (2020)

The Emergence of Factor Markets

Labor markets:

- Labor is hired in by landowners

Land markets:

- Land is leased in by laborers/tenants

The Emergence of Factor Markets

Labor markets:

- Labor is hired in by landowners

Land markets:

- Land is leased in by laborers/tenants
- These are two sides of the same coin:
 - Almost to the extent that it seems one side is redundant.
 - But there are **imperfections in both the land-lease and labor markets**

A Remark on Land and Labor as a Parable

- Land and labor are two inputs located in different hands.
- They are brought together in a market.
- **Labor market** when the landowner makes all the decisions.
- **Tenancy market** when the laborer makes all the decisions.

A Remark on Land and Labor as a Parable

- Land and labor are two inputs located in different hands.
- They are brought together in a market.
- **Labor market** when the landowner makes all the decisions.
- **Tenancy market** when the laborer makes all the decisions.
- This is a parable, because it applies to other matching problems:
 - **Credit markets**: “money” matching with “entrepreneurs.”
 - **Venture capital market**: “capital” meets “ideas” (complex contracts)
 - **Technology licensing**: “patented knowledge” meets “capital.”

An Imperfection in the Land-Lease Market

Yucheng leases his land to Hsueh-Ling

- Hsueh-Ling cultivates and pays rent to Yucheng.
- If the output is perfectly certain, Hsueh-Ling would make his own production choices and pay a fixed rent to Yucheng.
- Yucheng adjusts rent so that Hsueh-Ling's net return equals the return from his next-best alternative, or his opportunity cost.

An Imperfection in the Land-Lease Market

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But if the output is uncertain and Hsueh-Ling is risk-averse ...

- this creates an extra cost **in addition to** Hsueh-Ling's opportunity cost.
- Possibly because **insurance** markets are imperfect (it's all connected).
- ⇒ an imperfection or a **transaction cost** in the tenancy market.

An Imperfection in the Labor Market

Yucheng hires Hsueh-Ling instead.

- Now Hsueh-Ling gets a fixed wage, and there is no need for insurance.
- Youcheng adjusts this wage to deliver Hsueh-Ling's next-best alternative.
- All good?

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- All good?

Not really. Hsueh-Ling needs to put in the work.

- supervision costs:
supervisors need to be paid
- incentive payments:
extra premium will need to be paid.
- \Rightarrow an imperfection or a **transaction cost** in the labor market.

Which equilibrium structure leads to the smallest transaction costs?

- General idea for moral hazard:
 - Outputs are sensitive to the efforts of many individuals.
 - Let the person with “greatest sensitivity” be the **residual claimant**.
 - Gets us closest to implementing the maximal social surplus.

Market Structure

Which equilibrium structure leads to the smallest transaction costs?

- General idea for moral hazard:
 - Outputs are sensitive to the efforts of many individuals.
 - Let the person with “greatest sensitivity” be the **residual claimant**.
 - Gets us closest to implementing the maximal social surplus.
- Adam Smith in [The Wealth of Nations](#), Book III Ch 2, on sharecropping:

“It could never, however, be the interest of this species of cultivators, to lay out, in the further improvement of the land, any part of the little stock they might save from their own share of the produce, because the lord, who laid out nothing, was to get one-half of whatever it produced.”

Land Lease and the Smith Doctrine

The British versus the French

- Fixed-rent versus sharecropping

Land Lease and the Smith Doctrine

The British versus the French

- Fixed-rent versus sharecropping
- Tenant has land, puts effort of e to produce output Y at cost $c(e)$
- Landlord asks for $R(Y)$: output-dependent rent.
- Fixed-rent tenancy: $R(Y) = R$.
- Sharecropping: $R(Y) = \sigma Y$, where $0 < \sigma < 1$.

Land Lease and the Smith Doctrine

The British versus the French

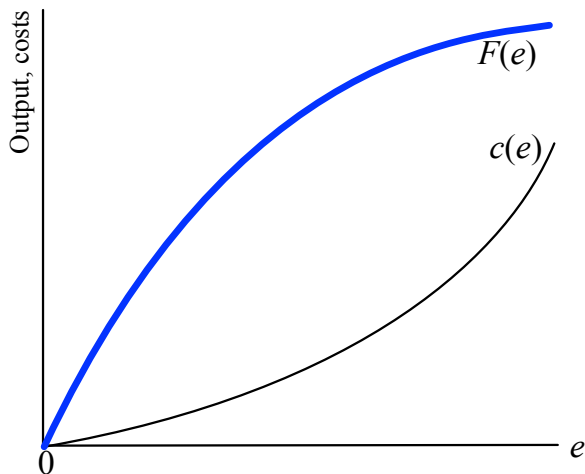
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- Sharecropping: $R(Y) = \sigma Y$, where $0 < \sigma < 1$.
- Which system is “superior”?
- Social surplus = $\underbrace{[Y - c(e) - R(Y)]}_{\text{Tenant}} + \underbrace{[R(Y)]}_{\text{Landlord}}$.
- **Smith doctrine**: Efficient contract maximizes the social surplus.

Land Lease and the Smith Doctrine

$$\text{Social surplus} = [Y - c(e) - R] + R = Y - c(e) = F(e) - c(e).$$

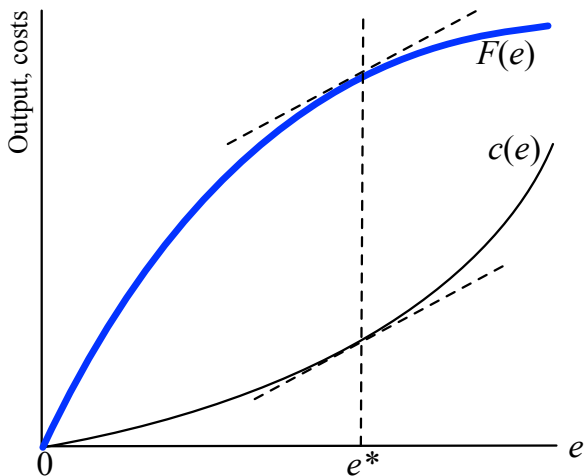
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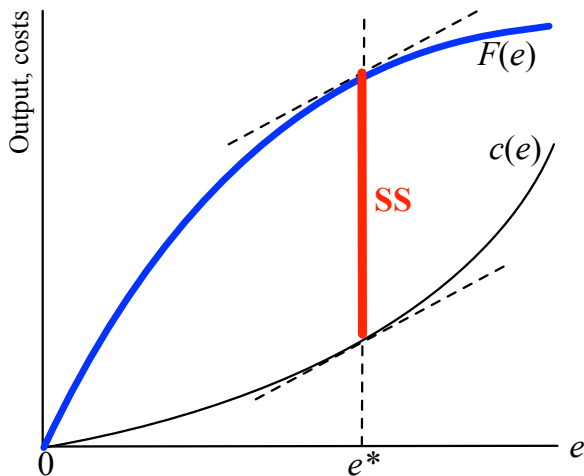
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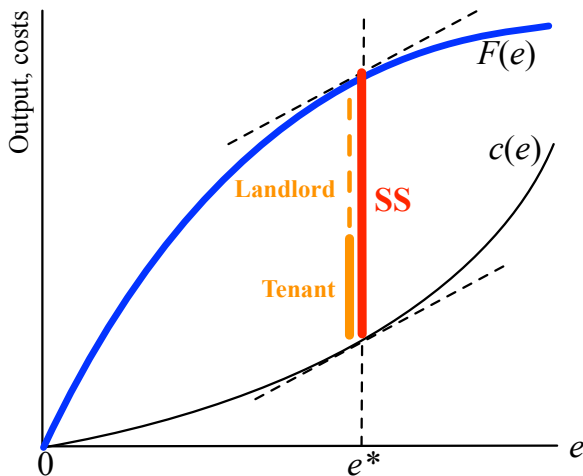
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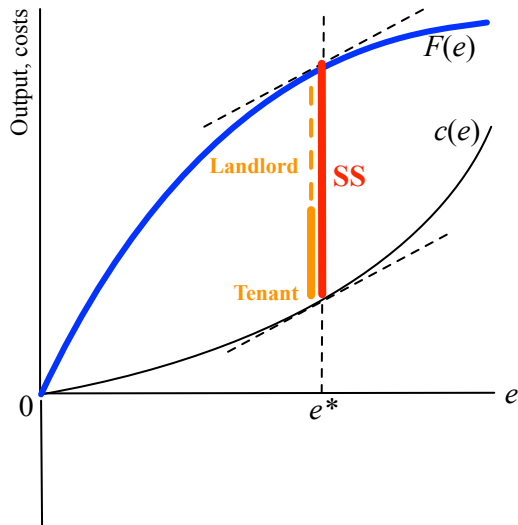
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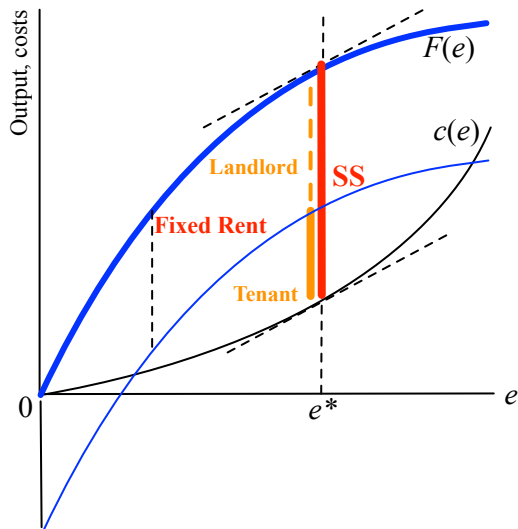
Land Lease and the Smith Doctrine

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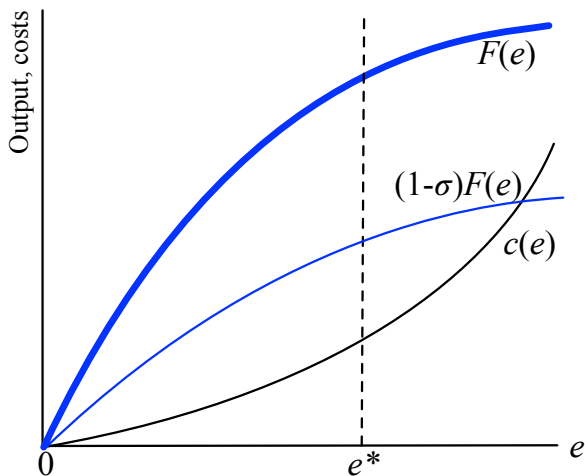


Land Lease and the Smith Doctrine

Sharecropping distorts the social surplus:

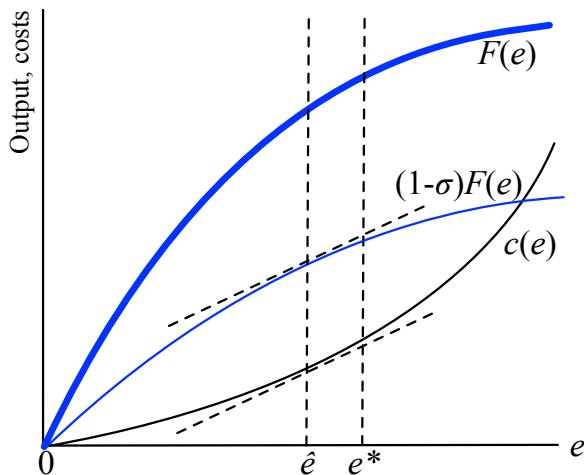
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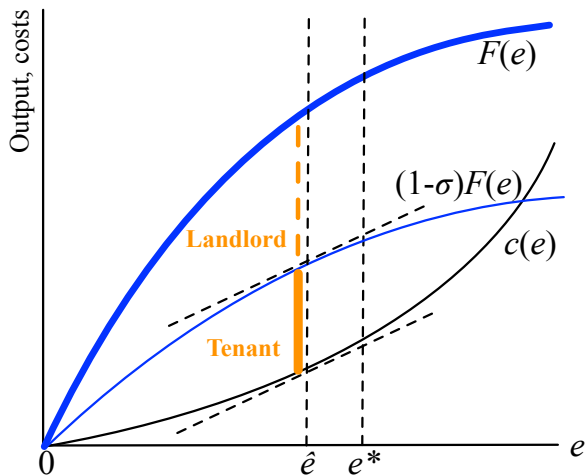
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Land Lease and the Smith Doctrine

Sharecropping distorts the social surplus:



A Critical Evaluation of the Smith Doctrine

Three important exceptions to the above argument:

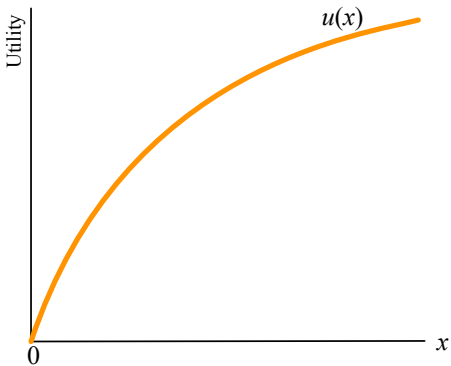
1. Risk.

- Tenant often poor, and is more averse to risk.
- Fixing e , say that output is h (prob. p) and ℓ (prob. $1 - p$).
- **Fixed rent R** : tenant keeps $h - R$ (prob. p) and $\ell - R$ (prob. $1 - p$).
- **Sharecropping σ** : tenant keeps $(1 - \sigma)h$ (prob. p) and $(1 - \sigma)\ell$ (prob. $1 - p$).
- Compare two such methods generating same average:

$$p(h - R) + (1 - p)(\ell - R) = p(1 - \sigma)h + (1 - p)(1 - \sigma)\ell$$

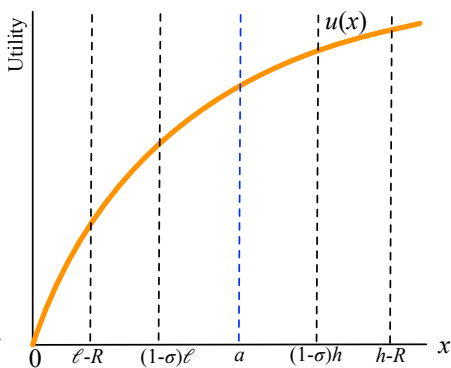
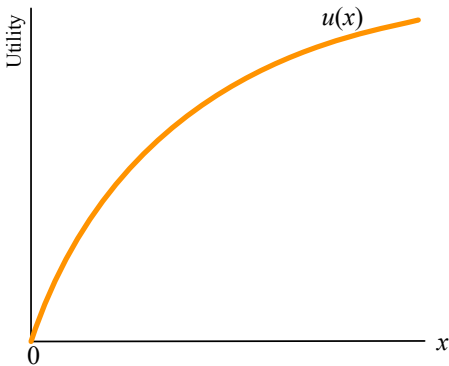
A Critical Evaluation of the Smith Doctrine

Risk



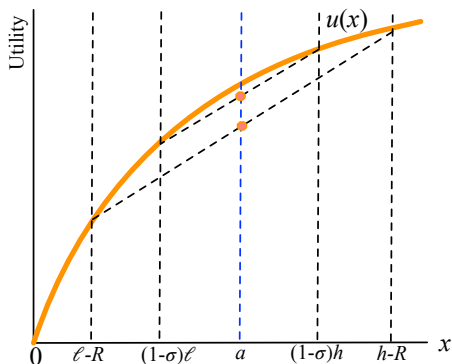
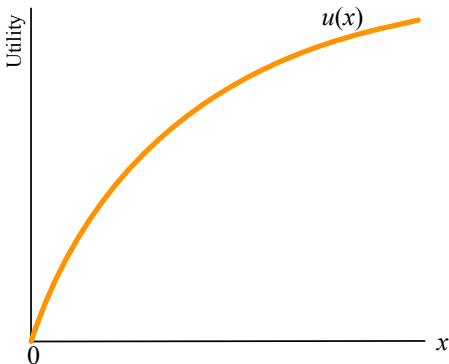
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Risk



A Critical Evaluation of the Smith Doctrine

Risk



Fixed-rent tenancy is inefficient at sharing risk.

A Critical Evaluation of the Smith Doctrine

Three important exceptions to the above argument:

2. Limited Liability.

- Again, we need uncertain output for this argument.
- What if for some realizations Y , $Y - R$ is below tenant subsistence?
- And what if the tenants have no assets to pay off that difference?
- Then effort will be undersupplied **just as in the debt overhang model**.

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2. Limited Liability.

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- And what if the tenants have no assets to pay off that difference?
- Then effort will be undersupplied **just as in the debt overhang model**.
- In fact, pause here to appreciate some of the connections:
 - Output is a function of effort
 - Fixed rent is like charging a fixed rate of interest
 - Sharecropping is like lending with equity sharing
 - Some of the lessons here can be taken back to that context.

A Critical Evaluation of the Smith Doctrine

Three important exceptions to the above argument:

3. Double Moral Hazard

- In some cases, **the landlord may also need to put in effort** on the land.
- Label the landlord by 1 and the tenant by 2.
- **Landlord payoff:** $F(e_1, e_2) - c_1(e_1)$
- **Tenant payoff:** $F(e_1, e_2) - c_2(e_2)$

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- **Landlord payoff:** $F(e_1, e_2) - c_1(e_1)$
- **Tenant payoff:** $F(e_1, e_2) - c_2(e_2)$
- Incentives need to be provided on both sides.
- Fixed rent does not do that.
- Sharecropping may be a good compromise solution

A Critical Evaluation of the Smith Doctrine

Lesson:

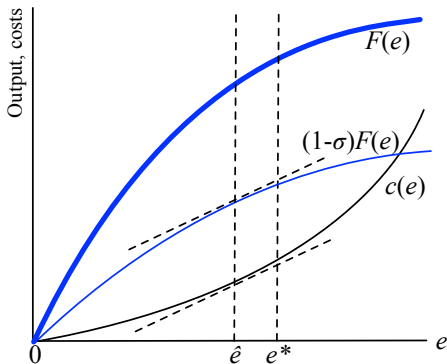
- Some degree of "reward compression" is needed
 - Either to share risk, or because
 - There is limited liability, or because
 - There is double moral hazard
 - These go **beyond the credit market model** studied earlier.

Tenancy With Cost-Sharing

- Suppose the contract specifies $\sigma : 1 - \sigma$ split in **both outputs and costs**:

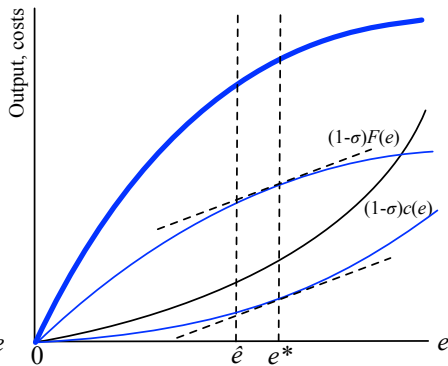
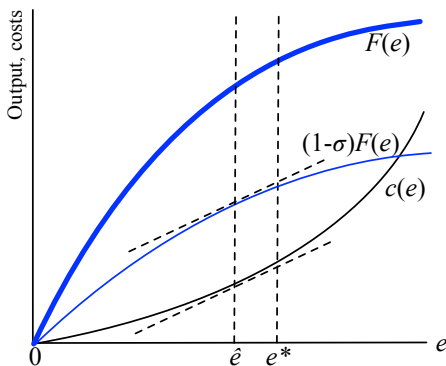
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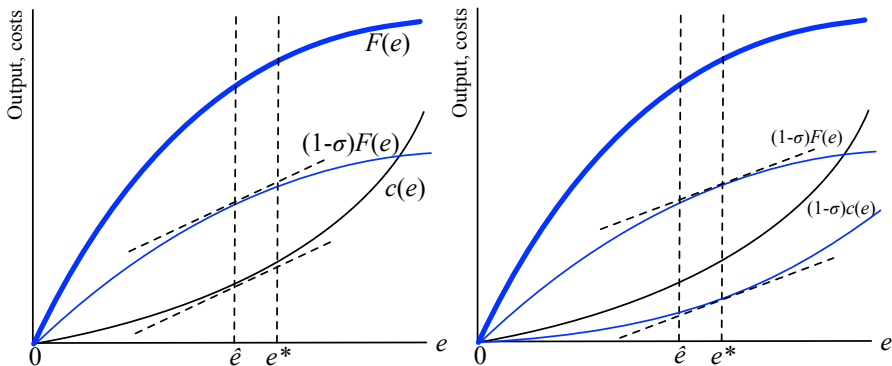
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Tenancy With Cost-Sharing

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- **Idea:** Choose σ so that $(1 - \sigma)[F(e^*) - c(e^*)]$ = tenant's best alternative.
- Tenant will willingly implement the first-order condition for social surplus maximization: $F'(e) = c'(e)$.

Tenancy With Cost-Sharing

- Why doesn't cost sharing take care of both risk-aversion *and* incentives?

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- Answer: **All costs may not be observable.**
- So the landlord cannot stipulate tenant effort.
- That said, some cost-sharing can alleviate the moral hazard problem.

Tenancy With Cost-Sharing

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- Answer: **All costs may not be observable.**
- So the landlord cannot stipulate tenant effort.
- That said, some cost-sharing can alleviate the moral hazard problem.
- That is, e could be a vector of inputs, only one of which is unobserved.
- Connection to interlinked contracts at the end of Slides 14.