

Development Economics III

Lecture 3

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Today's Lecture: Property Rights

Today:

- Property Rights and Investment
 - Security Argument (Besley, 1995)
 - Gains-from-Trade Perspective (Besley, 1995)
 - Collateral based View (BBG, 2012)
- Property Rights and Long-Term Growth (AJR, 2001)
- Property Rights and Labour Supply (Field 2007)
- The Distribution of Property Rights

Property Rights

What do we mean with ‘**property rights**’?

There are many aspects to property rights, including

- 1 The right to sell an object.
- 2 The right to use an object.
- 3 The right to receive the returns from an object.

We will talk about *some* reasons why property rights might be important for economic activities.

Discussion: At which level do property rights matter?

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4 The Distribution of Property Rights

Property Rights and Investment

Besley (1995)

What is the effect of ‘property rights’ on investment?

Organize our thinking:

- At time 1 decide how much capital k_1 to invest in a project.
- The project yield return $V(k_1, R_2)$ in period 2,
 V is increasing in both arguments, and concave.
- R_2 denotes the ‘property rights’ at time 2.
- The cost of investing is denoted by $c(k_1)$.
- Denote $W(k_1, R_2) := V(k_1, R_2) - c(k_1, R_2)$.

At the optimal choice of k_1 :

$$\frac{\partial k_1}{\partial R_2} = - \frac{W_{12}(k_1, R_2)}{W_{11}(k_1, R_2)}$$

Property Rights and Investment

Besley (1995)

At the optimal choice of k_1 :

$$\frac{\partial k_1}{\partial R_2} = -\frac{W_{12}(k_1, R_2)}{W_{11}(k_1, R_2)}$$

Since $W_{11} < 0$ at the maximum, this implies that investment increases with property rights if $W_{12} > 0$.

Different stories which give rise to this being satisfied.

Set-Up (cont.):

- With probability $\tau(R_2)$ the project is expropriated in period 2, $\tau'(R_2) < 0$.
 - In case of non-expropriation, the return from the investment is $F(k_1)$.
- The expected return to the investment is $V(k_1, R_2) = (1 - \tau(R_2))F(k_1)$ and hence

$$W_{12} = -\tau'(R_2)F'(k_1) > 0.$$

Result: If you run the risk of expropriation, your incentives to undertake (long-term) investments is dampened.

Security Argument

Besley (1995)

Result: If you run the risk of expropriation, your incentives to undertake (long-term) investments is dampened.

This insight seems obvious. It's the key channel which AJR (2001) have in mind when they argue that '**expropriatory institutions**' are detrimental to long-run growth.

A closely related effect of insecure property rights: **labour supply**. (See Field, 2007.)

Gaines-from-Trade Perspective

Besley (1995)

Set-Up:

- For the project owner, output at time 2 is simply θk_1 .
 - The marginal return to capital θ is however stochastic: distributed with p.d.f. $f(\theta)$ on $[\underline{\theta}, \bar{\theta}]$. Interpretation?
 - Another operator might have a different productivity. Denote his marginal product by ω , distributed with p.d.f. $g(\omega)$ on $[\underline{\omega}, \bar{\omega}]$.
- It might be optimal to transfer (rent/sell) the project!
- However, assume a cost of trade function $\mu(R_2)k_1$, $\mu' < 0$.
 - Lastly, bargaining is full-information Nash bargaining.

Gaines-from-Trade Perspective

Besley (1995)

Given Nash bargaining, the equilibrium price p of land solves

$$\max_p [p - (\mu(R_2) + \theta)k_1] \cdot [\omega k_1 - p].$$

Solution: $p^* = \frac{1}{2}(\theta + \omega + \mu(R_2))k_1$. The owner's payoff is $\frac{1}{2}(\omega + \theta - \mu(R_2))k_1$. This increases in R_2 . The owner will sell the land if this payoff is bigger than θk_1 . The expected from investing k_1 is hence:

$$V(k_1, R_2) = k_1 \mathbf{E}_\omega \mathbf{E}_\theta [\max\{\frac{1}{2}(\omega + \theta - \mu(R_2)), \theta\}],$$

where \mathbf{E} is the expectation operator.

Gaines-from-Trade Perspective

Besley (1995)

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where \mathbf{E} is the expectation operator.

Recall: *We want to know whether the marginal product of capital increases in property rights.*

Gaines-from-Trade Perspective

Besley (1995)

$$V(k_1, R_2) = k_1 \mathbf{E}_\omega \mathbf{E}_\theta [\max\{\frac{1}{2}(\omega + \theta - \mu(R_2)), \theta\}]$$

So all we need to do is to take the cross-partial. $\partial V / \partial k_1$ is:

$$\int_{\underline{\omega}}^{\overline{\omega}} \left(\int_{\underline{\theta}}^{\omega - \mu(R_2)} \frac{1}{2}(\omega + \theta - \mu(R_2)) f(\theta) d\theta + \int_{\omega - \mu(R_2)}^{\overline{\omega}} \theta f(\theta) d\theta \right) g(\omega) d\omega.$$

Applying Leibniz integral rule we find the cross-partial with respect to R_2 as:

$$\frac{\partial^2 V(k_1, R_2)}{\partial k_1 \partial R_2} = - \left[\int_{\underline{\omega}}^{\overline{\omega}} F(\omega - \mu(R_2)) g(\omega) d\omega \right] \mu'(R_2) > 0.$$

Gains-from-Trade Perspective

Besley (1995)

Intuition: When property rights are improved, the cost of trading goes down, and hence trade happens more often. The payoff from trade for the owner is increasing in k (k makes the land more valuable for both, and hence increases the price).

Hence improved property rights make trade more likely, which in turn gives an incentive to invest.

Collateral based View (Theory and Evidence)

Besley, Burchardi, Ghatak (2012)

...(board)...

Collateral based View (Theory and Evidence)

Besley, Burchardi, Ghatak (2012)

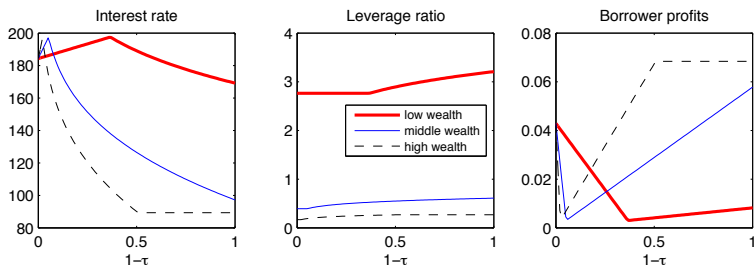


FIGURE II
NO COMPETITION (SRI LANKA)

Notes: The figure shows the predicted interest rate $(r/x - 1)/100$, the leverage ratio (x/w) , and the borrower's profits, $p(e)(q(x) - r) - (1 - p(e))c$, as a function of the extent to which capital can be collateralized as measured by $(1 - \tau)$. The borrower's profit is given as a fraction of the value of a year's labour endowment. Results are shown for three wealth levels, corresponding to the 5th (bold lines), 25th (solid lines) and 50th percentiles (dashed lines) of the wealth distribution in Sri Lanka. The data on the wealth distribution is taken from the baseline survey of MMW and depicted in Figure I. The model is parametrised using data from Sri Lanka, as explained in Section 5.2. The results presented are for the case where the outside option is autarky, i.e. $\bar{u} = 0$, corresponding to the case of a monopolistic lender.

Collateral based View (Theory and Evidence)

Besley, Burchardi, Ghatak (2012)

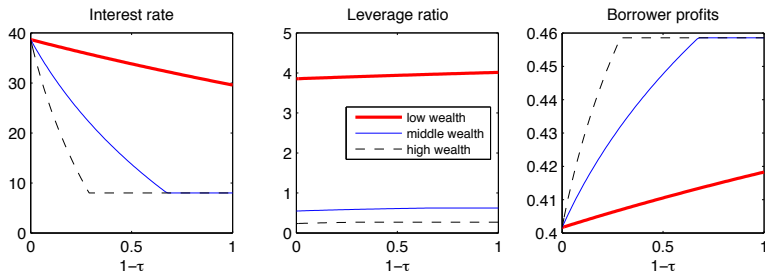


FIGURE III
COMPETITION (SRI LANKA)

Notes: The figure shows the predicted interest rate $(r/x - 1)/100$, the leverage ratio (x/w) , and the borrower's profits $p(e)(q(x) - r) - (1 - p(e))c$, as a function of the extent to which capital can be collateralized as measured by $(1 - \tau)$. The borrower's profit is given as a fraction of the value of a year's labour endowment. Results are shown for three wealth levels, corresponding to the 5th (bold lines), 25th (solid lines) and 50th percentiles (dashed lines) of the wealth distribution in Sri Lanka. The data on the wealth distribution is taken from the baseline survey of MMW and depicted in Figure I. The model is parametrised using data from Sri Lanka, as explained in Section 5.2. The results presented are for the case where the outside option is given by a second lender with the same cost of funds (nominal interest rate of 8%), corresponding to the perfectly competitive case.

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Property Rights and Long-Term Growth

Acemoglu, Johnson, Robinson (2001)

In the proceeding discussion we argued that ‘better’ property rights drive higher investment. This suggests property rights might as well have an effect on long-term growth.

Acemoglu, Johnson and Robinson argue, that one important determinant for long term development is the existence of institutions which protect private property from expropriation (i.e. institutions which guarantee secure property rights).

The empirical question is: Are these institutions really important for economic growth and if so, how much?

Unfortunately, this is **one of the harder questions around**, since institutions are likely to be determined jointly with economic outcomes.

Property Rights and Long-Term Growth

Acemoglu, Johnson, Robinson (2001)

Acemoglu, Johnson and Robinson have famously argued, that a valid instrumental variable for institutions is:

Settler Mortality

So they estimate the system of equations

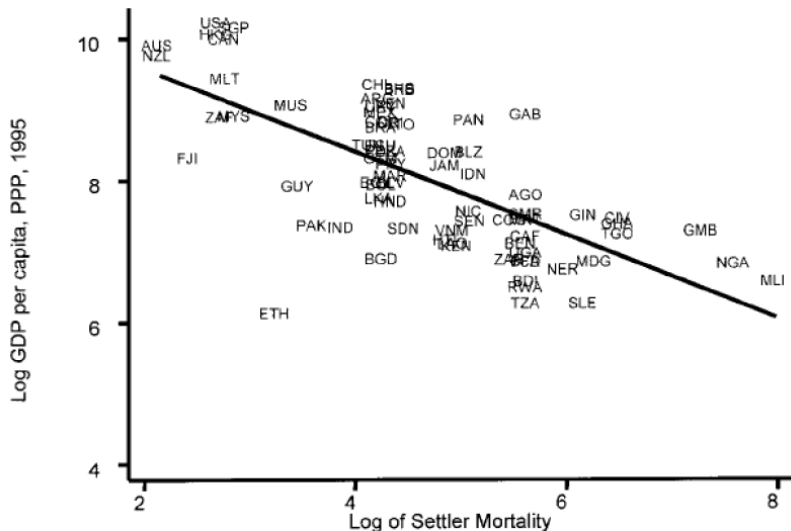
$$\begin{aligned} \log(y_i) &= \mu + \alpha R_i + x_i' \gamma + \epsilon_i \\ R_i &= \zeta + \beta \log(M_i) + x_i' \delta + \nu_i \end{aligned}$$

where y_i is income per capita, R_i is modern day property rights, X_i is a vector of covariates and M_i is early settler mortality.

Good idea?

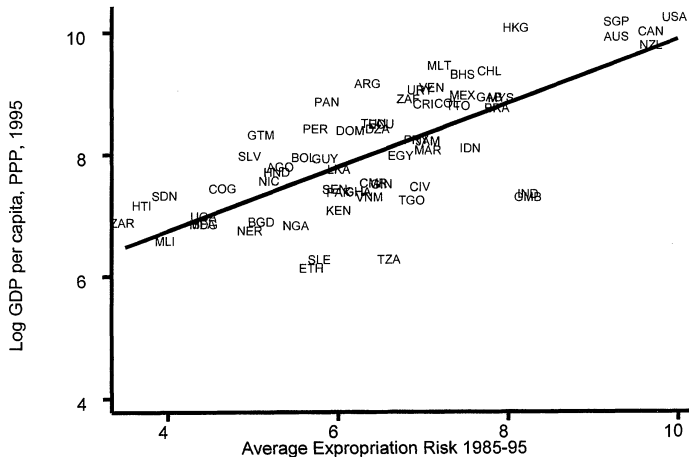
Property Rights and Long-Term Growth

Acemoglu, Johnson, Robinson (2001)



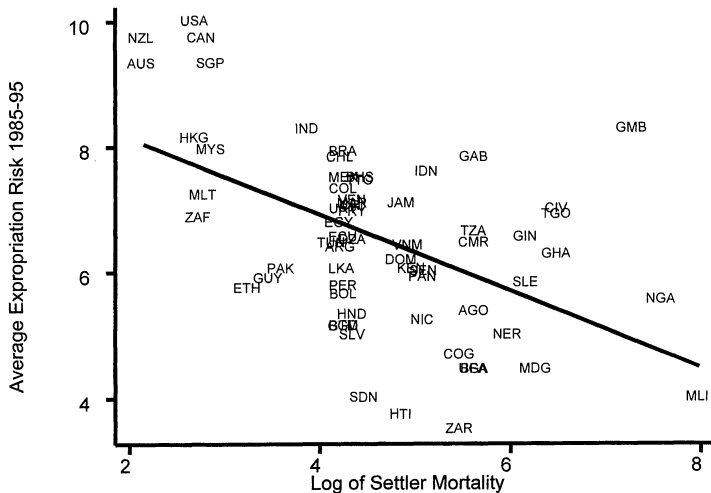
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Acemoglu, Johnson, Robinson (2001)



Property Rights and Long-Term Growth

Acemoglu, Johnson, Robinson (2001)



Property Rights and Long-Term Growth

Acemoglu, Johnson, Robinson (2001)

TABLE 4—IV REGRESSIONS OF LOG GDP PER CAPITA

	Base sample (1)	Base sample (2)	Base sample without Neo-Europes (3)	Base sample without Neo-Europes (4)	Base sample without Africa (5)	Base sample without Africa (6)	Base sample with continent dummies (7)	Base sample with continent dummies (8)	Base sample, dependent variable is log output per worker (9)
Panel A: Two-Stage Least Squares									
Average protection against expropriation risk 1985–1995	0.94 (0.16)	1.00 (0.22)	1.28 (0.36)	1.21 (0.35)	0.58 (0.10)	0.58 (0.12)	0.98 (0.30)	1.10 (0.46)	0.98 (0.17)
Latitude		-0.65 (1.34)		0.94 (1.46)		0.04 (0.84)		-1.20 (1.8)	
Asia dummy							-0.92 (0.40)	-1.10 (0.52)	
Africa dummy							-0.46 (0.36)	-0.44 (0.42)	
“Other” continent dummy							-0.94 (0.85)	-0.99 (1.0)	
Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995									
Log European settler mortality	-0.61 (0.13)	-0.51 (0.14)	-0.39 (0.13)	-0.39 (0.14)	-1.20 (0.22)	-1.10 (0.24)	-0.43 (0.17)	-0.34 (0.18)	-0.63 (0.13)
Latitude		2.00 (1.34)		-0.11 (1.50)		0.99 (1.43)		2.00 (1.40)	
Asia dummy							0.33 (0.49)	0.47 (0.50)	
Africa dummy							-0.27 (0.41)	-0.26 (0.41)	
“Other” continent dummy							1.24 (0.84)	1.1 (0.84)	
R ²	0.27	0.30	0.13	0.13	0.47	0.47	0.30	0.33	0.28
Panel C: Ordinary Least Squares									
Average protection against expropriation risk 1985–1995	0.52 (0.06)	0.47 (0.06)	0.49 (0.08)	0.47 (0.07)	0.48 (0.07)	0.47 (0.07)	0.42 (0.06)	0.40 (0.06)	0.46 (0.06)
Number of observations	64	64	60	60	37	37	64	64	61

Notes: The dependent variable in columns (1)–(8) is log GDP per capita in 1995, PPP basis. The dependent variable in column (9) is log output per worker, from Hall and Jones (1999). “Average protection against expropriation risk 1985–1995” is measured on a scale from 0 to 10, where a higher score means more protection against risk of expropriation of investment by the government, from Political Risk Services. Panel A reports the two-stage least-squares estimates, instrumenting for protection against expropriation risk using log settler mortality; Panel B reports the corresponding first stage. Panel C reports the coefficient from an OLS regression of the dependent variable against average protection against expropriation risk. Standard errors are in parentheses. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable descriptions and sources.

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Property Rights and Labour Supply

Another reason, why property rights might be economically important is that whenever you do not have formal property rights, you might want to spend a significant amount of time ensuring things are not taken away from you. Erica Field provided evidence of this in urban Peru.

Property Rights and Labour Supply

Evidence Setting

“In 1997, an estimated one-fourth of Peru’s population lived in marginal squatter settlements in periurban areas.”

The Peruvian government started a program, which offered **formal land titles** to these squatters. Field (2007) investigates the effect of this programme on the labour supply of those households covered by it.

How does that work? Why would just looking at the labour supply before and after the titling programme not be a convincing way to estimate the effect of the programme?

Property Rights and Labour Supply

Empirical Strategy

The problem is that the labour supply might have generally gone up during that period.

Good news: The programme was not introduced everywhere at the same time. So she looks at how the labour supply of households changed in areas where the programme was introduced first, and compares this with the change that occurred in areas where the titling programme was not yet introduced. To the extent that all the other things that drove labour supply up affected both regions similarly, this difference-in-difference estimates the effect of the titling programme.

Property Rights and Labour Supply

Evidence - Results

She finds that

- 1 “Households with no legal claim to property spend an average of 13.4 hours per week maintaining informal tenure security, reflecting a 14% reduction in total household work hours for the typical squatter family.” (So they seem to spend **a lot** of time protecting their place!)
- 2 “Household members are also 40% more likely to work inside of their homes.” (So when they work, they work at home.)
- 3 “For households with fewer than four potential workers, titling is associated with a significant reduction in child labour hours.”

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The Distribution of Property Rights

Example: Agriculture

Agriculture remains enormously important in the world.

- Close to half of worlds population works in agriculture,
- 50% in China; 57% in India,
- and most of the worlds poor.

Both to improve food security and the incomes of farmers, it is important to understand what drives agricultural productivity.

Property Rights and Agricultural Productivity

Farmsize - Productivity

There are many reasons to think large farms should be more productive than small farms:

- There are fixed costs involved in farming: e.g. bullocks or tractors.
- Larger farms might have better access to capital.
- Larger farms might be better politically connected.
- Good farmers may accumulate more land.

Property Rights and Agricultural Productivity

Farmsize - Productivity

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- There are fixed costs involved in farming: e.g. bullocks or tractors.
- Larger farms might have better access to capital.
- Larger farms might be better politically connected.
- Good farmers may accumulate more land.

But despite all this, there is little evidence of positive farmsize - productivity relationship in the data, mostly it is negative: so *smaller farms are more productive*.

Why might this be?

Property Rights and Agricultural Productivity

Farmsize - Productivity

An argument is:

Big farms are cultivated by hired labour, which might give rise to standard moral hazard problems. Small farms are owner cultivated.

This is a variation of the argument, that share-cropped farms are less productive than owner-operated farms (an argument which goes back to at least Alfred Marshall).

Property Rights and Agricultural Productivity

Farmsize - Productivity

If true, what are the policy implications?

Property Rights and Agricultural Productivity

Farmsize - Productivity

If true, what are the policy implications?

A **redistribution of land** might be a good thing!

In fact, this is the most often cited reason for why land redistribution might be a good thing. Why do people like this policy? Unlike many other policies, it is one that both increases equity (redistribute from the rich to the poor) and efficiency (roughly: output is going up).

Property Rights and Agricultural Productivity

Note: what we talked about is a reason why the **distribution** of property rights might be important for agricultural productivity.

We saw earlier, that the **existence** of property rights might be important investment and hence productivity. This holds in particular for agricultural productivity.

Property Rights and Agricultural Productivity

Operation Barga

One well-studied property rights reform which sought to improve agricultural productivity was the so-called 'operation BARGA' in the East-Indian state West Bengal.

The reform allowed farmers to register, which would grant them the right to use whichever land they were using at the time in the future, as long as they paid at least 25% of the returns from the field to the owner of the land.

Note, this reform had two effects:

- 1 It allowed farmers to get a better 'share'. Whatever they paid before, they now only needed to pay 25% of the value of the goods produced, i.e. keep 75% for themselves. This should increase their effort and hence productivity.
- 2 The reform secured property rights, since the farmers could now be sure that they would not be kicked out by the land owners. This should give them incentives to invest in the

Property Rights and Agricultural Productivity

What can we estimate with this data?

The researchers did not observe how much farmers invested in the land, they only observed in which regions the reform was implemented, and what the average agricultural productivity was.

With this data there is no way of knowing whether the reform worked because it's effect on the distribution of property rights, or it's effect on the existence of property rights. But: it does potentially allow to look at the total effect of this particular reform. How?

Property Rights and Agricultural Productivity

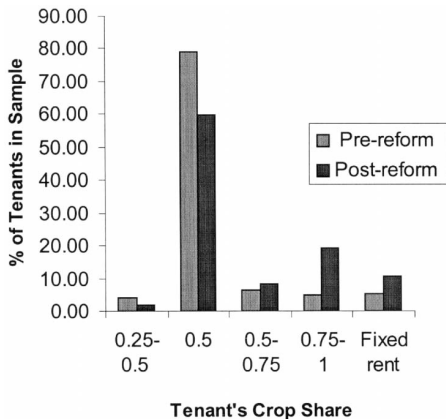
Strategy: Difference-in-Difference Estimator

The authors argue that neighbouring Bangladesh was very similar in most other ways, and is hence a suitable control group. So they argue, that **in the absence of the reform, West-Bengal would have developed the same way as Bangladesh did.**

They then estimate essentially a difference-in-difference estimator.

Property Rights and Agricultural Productivity

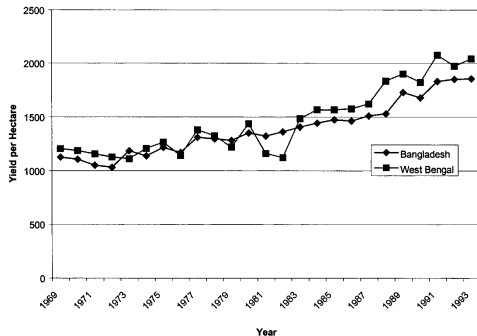
Tenant's Crop Share (First Stage)



The tenant's share in the share cropping contracts did actually go up. (Not everybody has 75%, but still.)

Property Rights and Agricultural Productivity

Agricultural Productivity



The agricultural productivity went up after the reform (1979-93) by about 51% **due to the property rights reform.**¹

¹In 1980 and 1981, West Bengal was hit by severe droughts.

Property Rights and Agricultural Productivity

Agricultural Productivity

Some things worth noting on the the methodology they used:

- Before operation Barga the agricultural productivity developed very similarly in West-Bengal and Bangladesh, suggesting that Bangladesh is maybe really a good control group.

Property Rights and Agricultural Productivity

Agricultural Productivity

Some things worth noting on the the methodology they used:

- Before operation Barga the agricultural productivity developed very similarly in West-Bengal and Bangladesh, suggesting that Bangladesh is maybe really a good control group.
- The difference between the productivity in Bangladesh and West-Bengal doesn't seem to be 51% from the graph. But remember that not all farmers took up the reform. Taking this into account, the effect for those who took up the reform (i.e. registered and so on) must have been 51% to explain the average growth in agricultural productivity across all farmers.

More Evidence

Agricultural Productivity

Shaban(1987) studied farmers who own both own and share-cropped land. He finds that farmers spend 40% more time on their own land, and the productivity there is 15% to 30% higher.

In this he controls for land size. What does that mean? Basically, we tries to compare how much more time a farmer spends on a plot of his own land *which is equally big as the share-cropped plot*.

Summary