Lecture Outline
Overview
What is the V-C-G?
How does it Work? (Example from Public Choice III)
Another Example (The Case of a Garden)
Limitations/Criticisms –Tyler Cowen

Overview

As discussed in last week's lecture, the free rider problem is one of the most pressing economic problems of the twentieth and twenty-first centuries. It occurs when an individual bears more than their fair share of a cost associated with a particular good.

The free rider problem is very similar to the concept of anti-climax: if you know something will happen anyway, why should you do anything to bring it about? Especially when you know that others will take action to bring it about!

Now that we've reviewed the free rider problem, let's move onto its solution…the moment you've all been waiting for…. developed by Edward H Clarke: the demand revelation procedure (also known as the Vickrey-Clarke-Groves mechanism).

What is the V-C-G?

The Vickrey-Clarke-Groves mechanism is a truth-telling mechanism; it's a system in which people have incentives to truthfully reveal their preferences. No one has an incentive to understate or overstate his or her preferences. Who participates in the system? The system contains stakeholders/voters, alternative policies, and a neutral observer (social planner).

We ask the individuals to reveal the net benefits (benefits – costs) associated with each policy, and then tally up the benefits for each policy scenario. The policy with the most total "benefits" wins. However, the system consists of the following additional rules:

> If a person or stakeholder's preferences are large enough to change the outcome of which policy wins, they are considered **pivotal.** Think of them as "swing voters" who can swing the outcome of an election.
> If a person is **pivotal** then they pay an "Incentives Tax" (also known as the "Clarke Tax") to people who preferred the losing policy. This tax is equivalent to the net sacrifice (benefits foregone) that the "losers" incur as a result of the new policy.

I will begin with an example from Dennis Mueller's book Public Choice III.

Example 1: How Does it Work?

Voter	Policy Option 1	Policy Option 2	Incentive Tax
A	$30		$20
B		$40	$0
C	$20		$10
Total Benefits	$50	$40	$30

First let's tally up the benefits from Policy option 1; they are $50.

And what are the benefits of policy option two:? $40.

Therefore, Policy Option 1 wins, since 50 >40.

Are any voters pivotal? Yes. Voters A and C both change the outcome of the election, so they both pay an incentive tax.

You can calculate the incentive task for an individual by removing them and then observing the difference in net benefits for the remaining stakeholders.

If you remove A, then A must pay a tax of $20 (40-20) to voter B.
If you remove C, then C must pay $10, or $40-30 = $10.

Do you have an incentive to understate your preferences?

According to Dennis Mueller, the answer is a resounding no. If voter A understates their preferences below $21, then their favored policy will lose, and they will trade a $10 gain for no gain at all!

Do you have an incentive to overstate your preferences?

If you are voter A or C then overstating your preferences does not benefit you at all. It reduces the incentive tax that another stakeholder will have to pay, but assuming rational self-interest, this strategy makes no sense. Overstating your preferences does not make sense.

Carl made a very good observation in class. If you are voter C, you do have an incentive to overstate your preferences so that you possess just slightly less than the total benefits of Policy Option 1. This is because you would maximize the compensation you would receive from the other stakeholders. However, in practice you would not have the information (other people's preferences and their total benefits) to pursue such a strategy.

Example 2: Another example; the case of a garden

Assume two neighbors could benefit from having a garden in their neighborhood. Each would receive a benefit of $1.00 from the garden. However, the garden costs $1.50 to produce.

What if you decide to free ride off of your neighbor? Then you get the $1.50 benefit, and your neighbor shoulders the entire cost of the project!

(Since the benefit is $1.00; the cost if $1.50: 1-1.50 = -.5). Talk about unfairness!

What if you both share the costs equally, (1.50/2 = .75)? Then you both get a net benefit of $.25.

Of course, community spirit and a love-thy neighbor feeling might lead the two neighbors to share the costs equally, but let's assume they don't trust each other.

Let's also assume rational self-interest, there would be an incentive for each neighbor to free ride. Would you prefer a benefit of $1.50 or $.25? $1.50, of course.

This leads to the outcome that no garden is produced, even though a mutually beneficial outcome is possible. This is known as the **Prisoner's Dilemma** in economics. A good way to think of the prisoner's dilemma is to think of it as the conflict between group rationality and individual rationality. If we think as individuals, rationally pursuing our self-interest, we choose the worst outcome (no garden is provided). However, if we cooperate, we can have the garden and share the benefits equally.
Individually, we could be made better off by free riding. However, when we both try to free ride, then nothing is produced!

This example is designed to show that not only does demand revelation solve the free rider problem; it also solves the prisoner's dilemma! I have adapted these examples from Chapter One of Ed Clarke's book Demand Revelation.

Assume the neighbors agree to enter a demand revelation system and hire a neutral third party observer (perhaps the Government). Now each person agrees to pay the incentive tax (the net sacrifice the other person incurs when their preferred policy outcome loses the contest).

Scenario 1: Neighbor one pays the entire cost.

Neighbor	Provide a Garden	Do Not Provide it	Incentive Tax
1	-.5	0	0
2	1	0	.5

This is an example of the free rider problem as well as the prisoner's dilemma. Neighbor one is compensated and has a $0 cost from providing the garden.

Scenario 2: Neighbor one pays ¾ of the cost.
*** $1.50* ¾ = 1.125

Neighbor	Provide a Garden	Do Not Provide it	Incentive Tax
1	-.12	0	0
2	.62	0	.12

Scenario 3: Equal sharing, each person pays $.75

Neighbor	Provide a Garden	Do Not Provide it	Incentive Tax
1	.25	0	0
2	.25	0	0

Example 3:

This example is adapted from Ed Clarke's book *Demand Revelation & The Provision of Public Goods*. As you add more and more stakeholders the Incentive Tax decreases. In the example below it goes to 0.

Person	Policy 1	Policy 2	Incentive Tax
A	$.25	0	0
B	0	$.75	$.25
Total	$.25	$.75	$.25

Person	Policy 1	Policy 2	Incentive Tax
A	$.25	0	0
B	0	$.75	0
C	$.25	0	0
D	0	$.75	0
Total	$5	$1.50	0

What have we learned from these examples?

> *Cost allocation affects the Incentive/Clarke Tax*
> *The Incentive Tax is not only a way around the free rider problem, but also the prisoner's dilemma.*
> *Adding stakeholders reduces the Incentive/Clarke Tax*
> *The Clarke/Incentive tax may not be applicable to a particular policy problem due to the fact that there are no pivotal voters/stakeholders.*
> *The VCG discourages messy income redistribution programs.*

This is a good transition to examining the limitations of the VCG.

Waste: In our analysis we assumed the benevolent neutral observer or central planner who collected the Incentive Tax redistributed it appropriately. In real life, we know that taxes collected for social security are used to fund the war in Iraq. If the Incentive tax is wasted or used for some other purpose, it fails to achieve an efficient outcome.

Strategy: Individuals have no incentive to pursue non-cooperative behavior; but coalitions do. By forming coalitions, people can reduce the amount of incentive tax they have to pay.

Information: We assume stakeholders are rational and take the time to research and gather information to make informed valuations of their willingness to pay for various policies.

Balanced Budget: The procedure does not necessarily guarantee a balanced budget.

Fallibility of Monetary Compensation:

In his new book, *Discover Your Inner Economist*, Tyler Cowen points out that monetary incentives are not always effective when dealing with human motivations. For example, it would not be a good idea for a parent to pay their child to do chores. Children should already do the chores out of respect and obligation. Monetary incentives can often make matters worse.

I think Alex brought up a really good point about the day care center in Chile. Parents showed up late to pick up their kids, so the daycare center starting charging fines. As a result, the number of parents who picked up their kids late increased. The fines made coming late acceptable. In order to avoid such problems, Tyler Cowen lays out several examples of when to use monetary incentives and when not to use them.

1)   "Offer monetary incentives when performance at a task is highly responsive to extra effort" Examples include clerical work and accounting.
2)   "Offer monetary rewards when intrinsic motivations are weak"
3)   "Pay monetary rewards when receiving money for a task produces social approval"

It's also important to remember that:
4)   Higher monetary rewards might cause people to choke, or even intensify bad strategies.
5)   "The application of punishments and rewards can make us feel like slaves; the result is poor performance."

What does this mean for demand revelation? First of all, there will be some issues for which monetary compensation is not acceptable to a stakeholder. For example, if I oppose the war in Iraq, there is no amount of money that I would take to accept an

interventionist foreign policy. However, the demand revelation procedure is still very effective in dealing with public goods, quasi-public goods, and even private goods.

Note: Prof. Trindle made a really good point last week. A strong sense of community fellowship would also eliminate the free rider problem.

This week we have seen what the VCG is, applied it to a real world scenario, and reviewed some of its limitations/criticisms. In the next few weeks we will review real life applications and see the "upside" of demand revelation, as the Demand Revolution continues.

References

Mueller, Dennis. Public Choice III. Cambridge: Cambridge University Press, 2003.

Clarke, Edward. Demand Revelation & The Provision of Public Goods. New York: IUniverse, 2000.

Cowen, Tyler. Discover Your Inner Economist. Dutton: Penguin Group, 2007.