Regional and Local Public Economics

Mengwei LIN

mengwei.lin@ub.edu

I thank Dirk Foremny, Zelda Brutti, and Candan Erdemli for useful materials compiled in previous years.

Spring 2025

Recap: Roadmap of the Course

I. Theory

1. **Income** Decentralization: taxation (7 lectures) with Andreu
2. **Expenditure** Decentralization (4 lectures) with Julia
3. Intergovernmental **Grants** (3 lectures)

II. Application

4. Application 1: International **Comparison** (Spain, Canada, China, Germany, 4 lectures)
5. Application 2: **Policy** Analysis (health, education, health, transportation, etc., 4 lectures)

III. Extension: International Fiscal Federalism (1 lecture) with Andreu

Basics of the Unit: Intergovernmental Grants

Three lectures on "**Inter-governmental Grants**", discussing the following topics:

1. Introduction to inter-governmental grants
2. Economic consequences of inter-governmental grants ⭐
    1. Theoretical Analysis
    2. Numerical Exercise
3. A special type: equalizing grants (if time allows)

Intergovernmental Grants

Lecture 1 Introduction: Definition and functions

March 24, 2025

Reading for this lecture: **Chapter 9**: "Intergovernmental grants"

State and Local Public Finance, by Ronald C. Fisher

Today's Agenda

1. From decentralization to grants: why grants?

   1.1 Stylized facts

   1.2 Purposes/Functions of Grants

2. How to conceptualize grants?

   - Basic Framework: Characteristics → Different Types

What are intergovernmental grants?

Definition

Intergovernmental grants: transfers of funds from one government to another, *most often* from a higher-level government to lower-level ones.

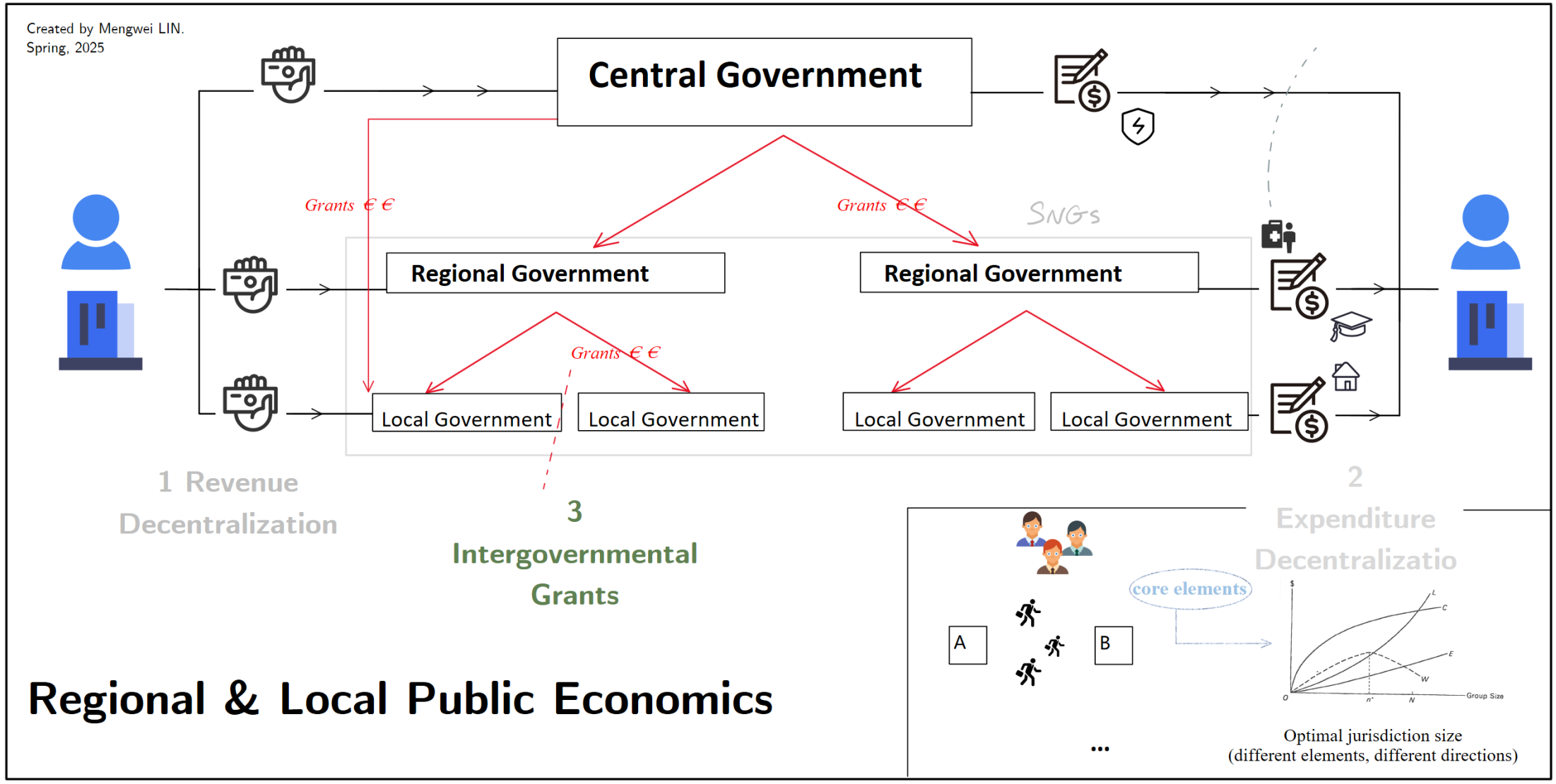
- not only in federal states but also in non-federal countries with multiple levels of governments

From Decentralization to Intergovernmental Grants

- Decentralization of Income (Unit 1)
- Decentralization of Expenditure (Unit 2)
  - Optimal size for public goods/services provision

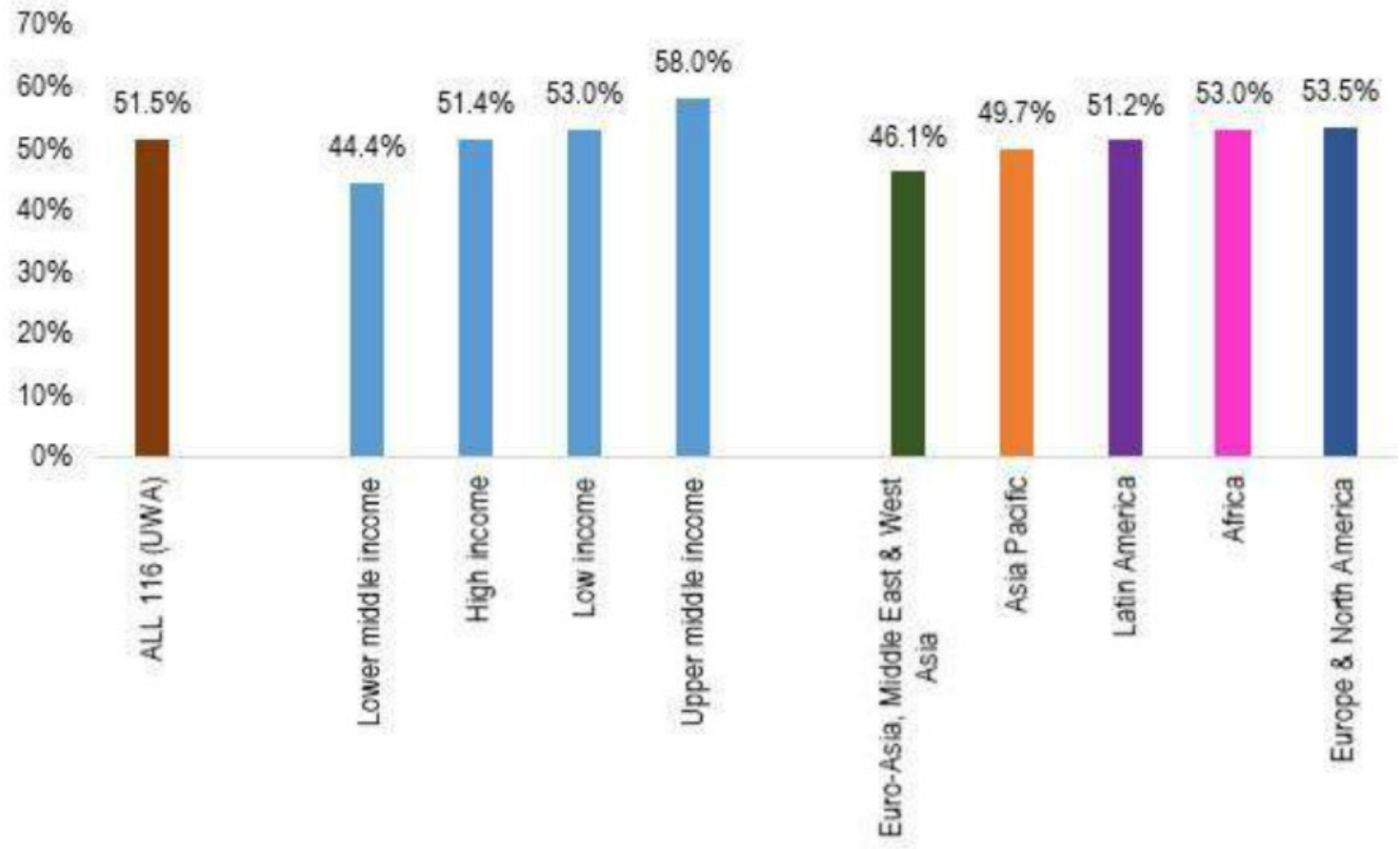
- Question 1: Local taxation enough to cover local expenditure (financial gaps)?
- Question 2: What about unequal public services within a country (inequality)?

Fiscal Decentralization and Grants: a big picture



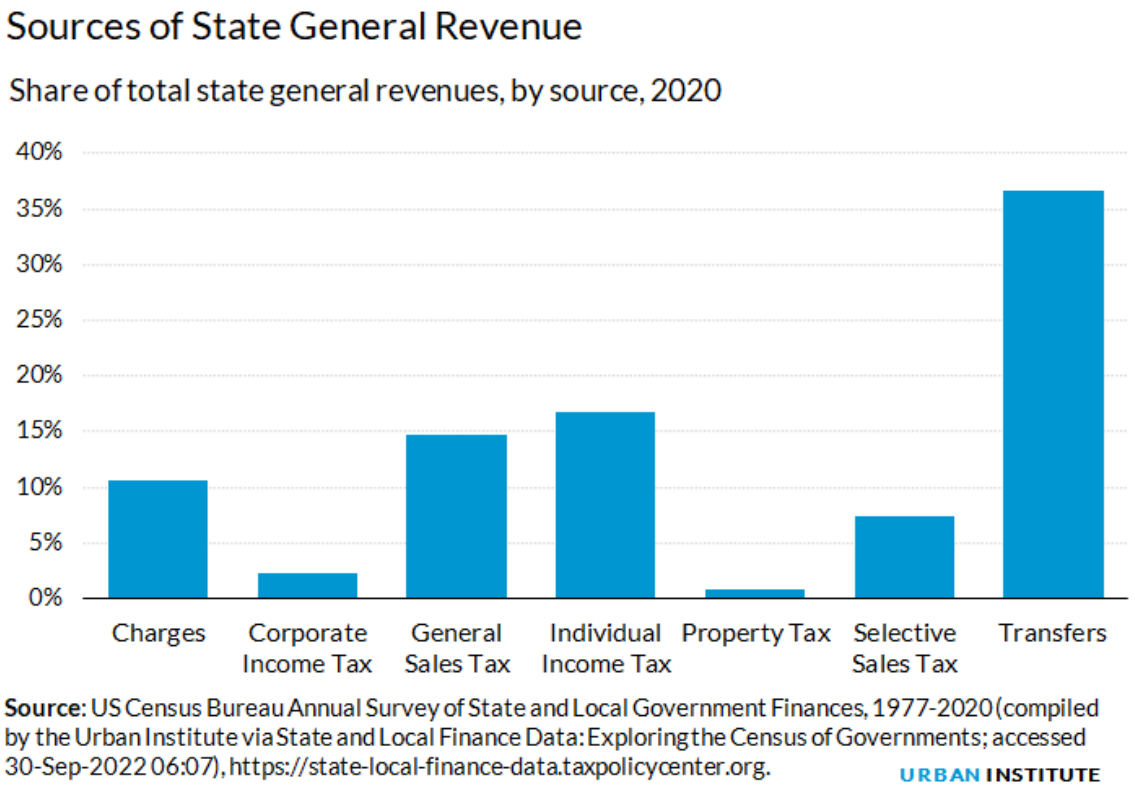
1.1 Motivation: HALF of SNG income!

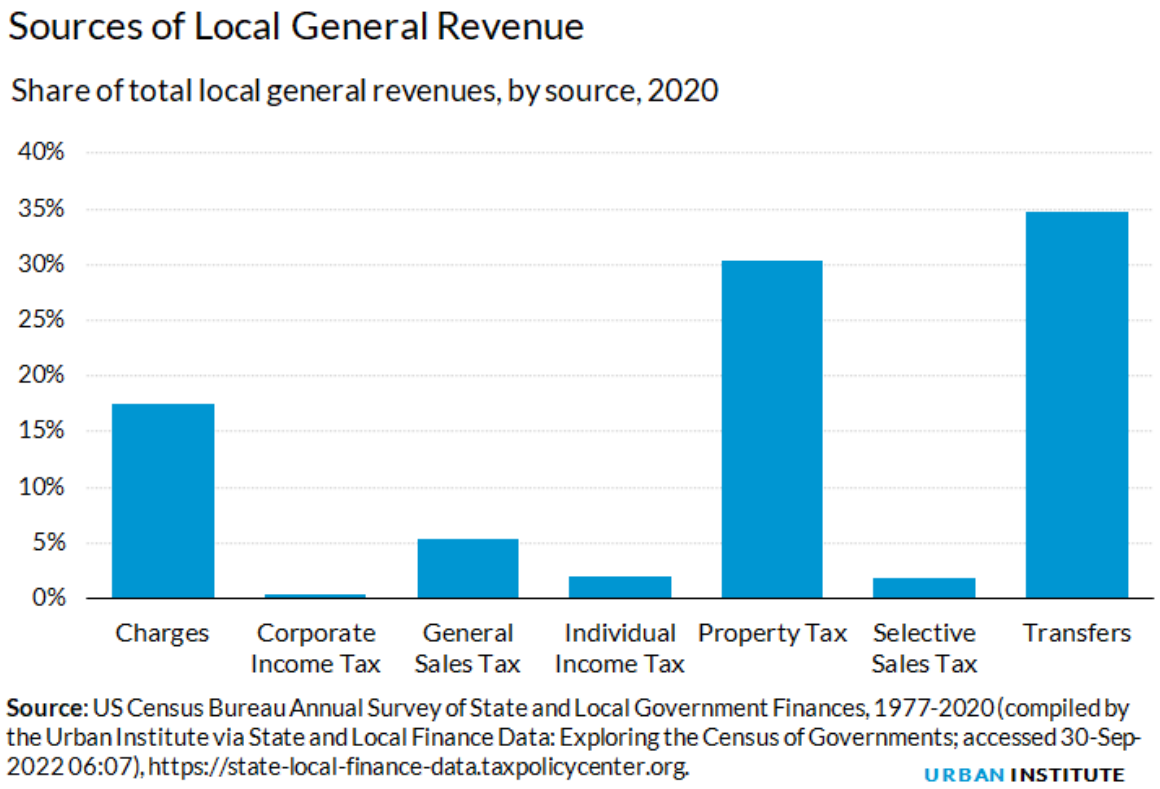
Grants and subsidies as a share of SNG revenue by income group and world region (2020)



Source: OECD (2022), *2022 Synthesis Report World Observatory on Subnational Government Finance and Investment*, OECD Publishing, Paris, https://doi.org/10.1787/b80a8cdb-en.

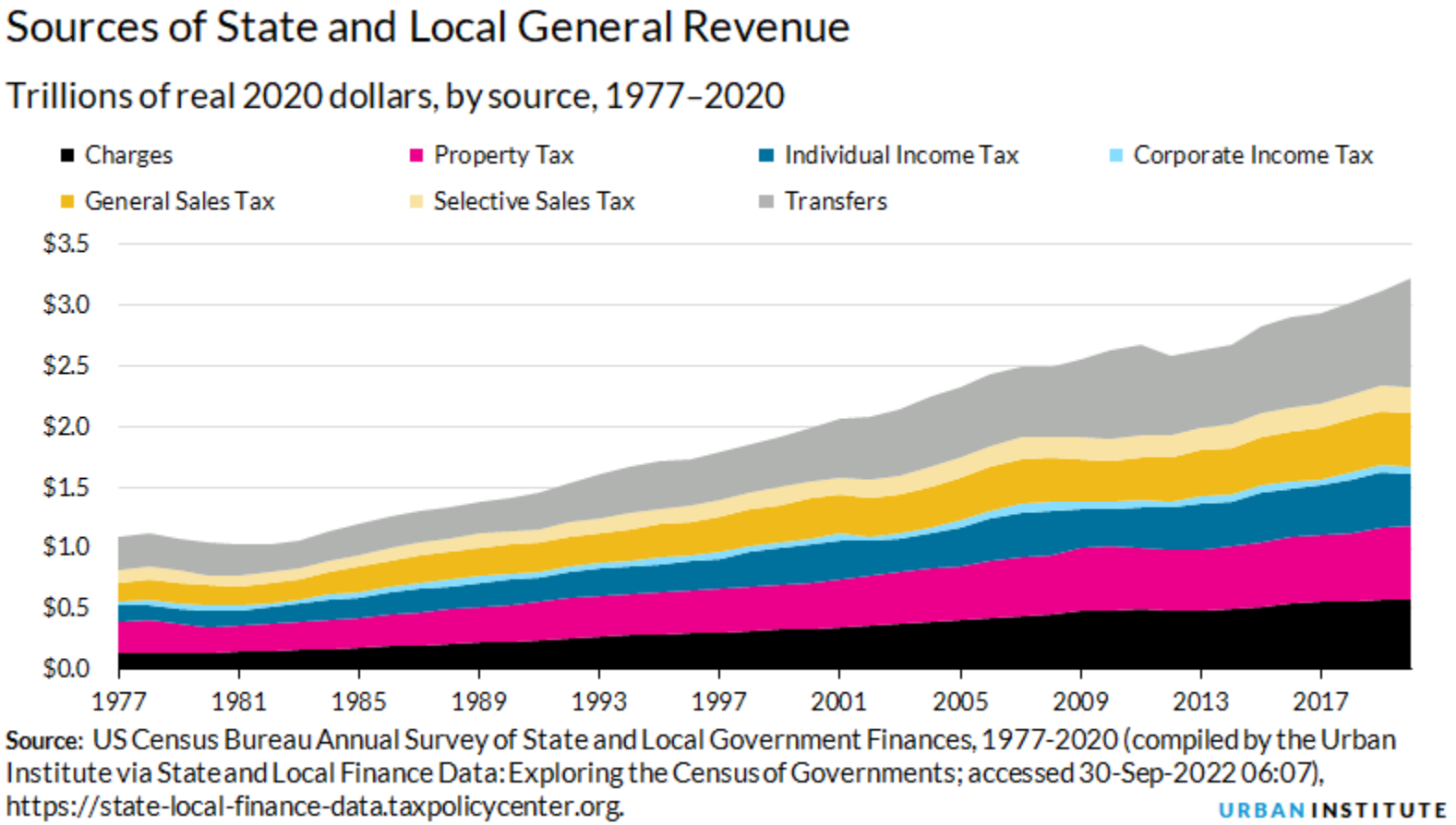
The Case of the US





Source: State and Local Backgrounders, Urban Institute (2022)

The Case of the US

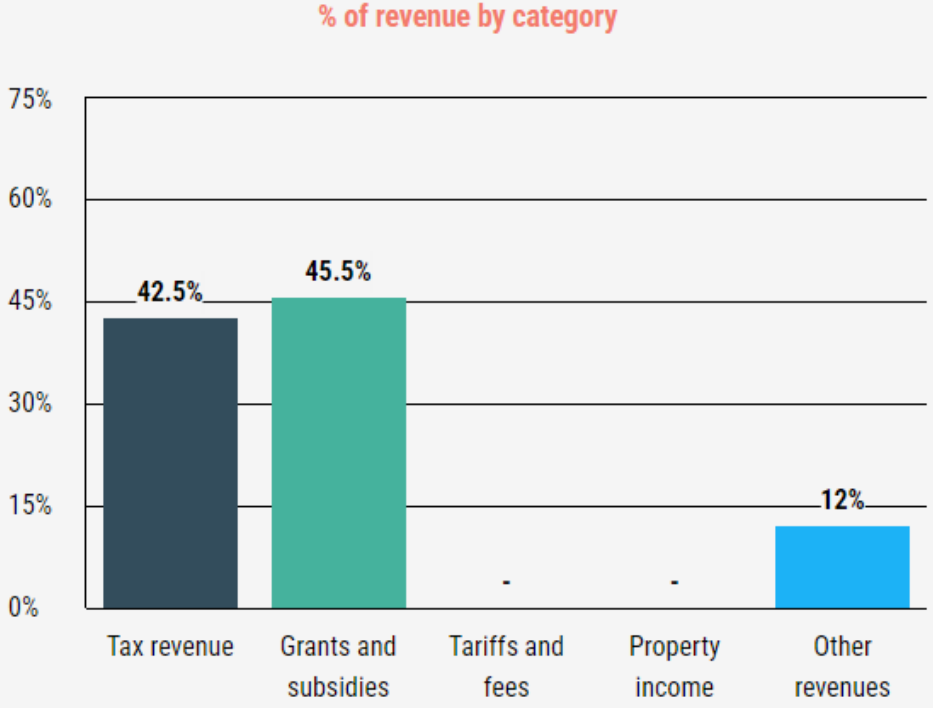


Source: State and Local Backgrounders, Urban Institute (2022)

The Case of China

SUBNATIONAL GOVERNMENT REVENUE BY CATEGORY

2020	DOLLARS PPP / INHABITANT	% GDP	% GENERAL GOVERNMENT	% SUBNATIONAL GOVERNMENT
Total revenue	3 386	19.7%	79.4%	100.0%
Tax revenue	1 438	8.4%	50.9%	42.5%
Grants and subsidies	1 541	9.0%	-	45.5%
Tariffs and fees	0	0.0%	-	0.0%
Income from assets	0	0.0%	-	0.0%
Other revenues	408	2.4%	-	12.0%

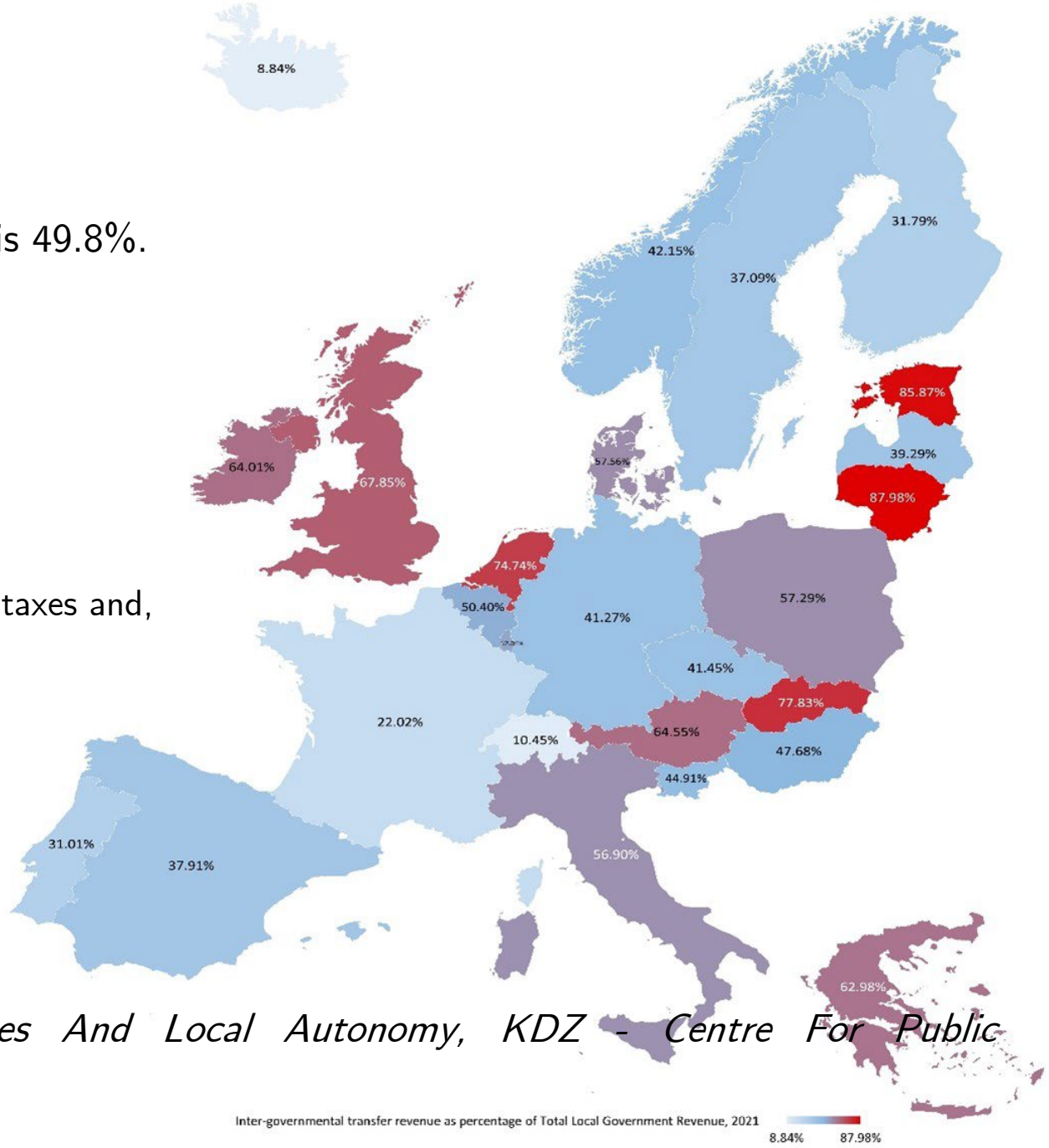


Source: OECD (2020), SNG-WOFI Database

Europe:

The average for the OECD-European countries is 49.8%.

* Intergovernmental transfers can also include shared taxes and, in some countries (e.g. Italy), regional budgets too.



Source: European Local Government Finances And Local Autonomy, KDZ - Centre For Public Administration Research, 2022

1.2 Purposes of grants

According to economic theory:

1. **Vertical** imbalances
    1. Close vertical fiscal **gaps** (VFG)
2. **Horizontal** imbalances
    1. Macroeconomic **stabilization**
    2. Explicit **redistribution** of resources among regions or localities
        - "Equalization grants"
    3. Improve the **efficiency** of fiscal decisions of sub-national governments
        - e.g., correcting for externalities

Purpose 1 VFG

Fiscal Gap: the difference between revenue means and expenditure needs

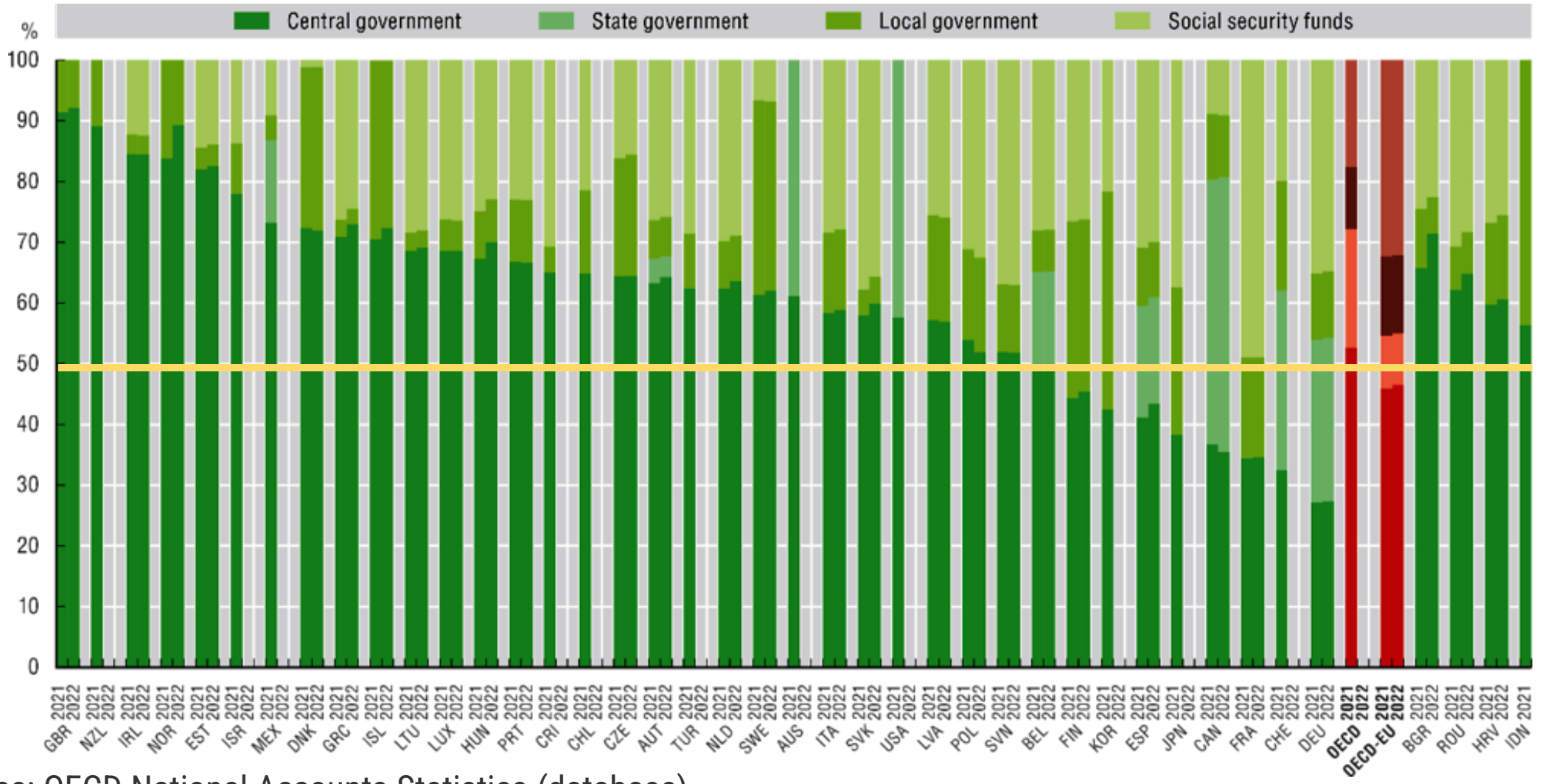
- Central government (+) raises more revenue than needed
  - redistribute the excess to support SNG (-).

The existence of a VFG:

1. Easier and more efficient to decentralize expenditures than taxes
2. Necessary for the central govt to transfer funds to SNGs to fulfill its responsibility for achieving efficiency and equity, and have some political control

Public Economic Structure by Level of Government: revenues

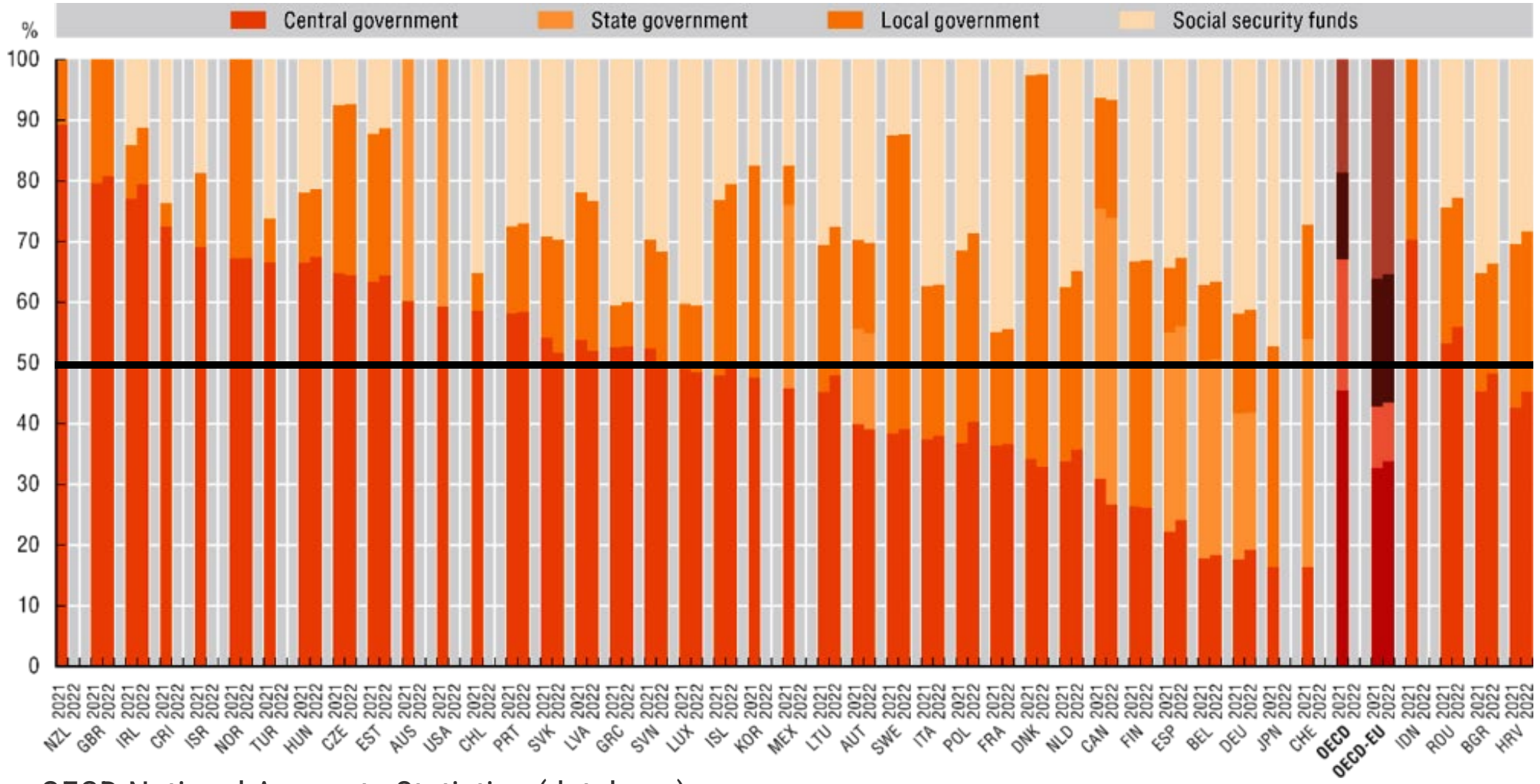
General Government Revenues across Levels of Government, 2021 and 2022



Source: OECD National Accounts Statistics (database).

Public Economic Structure by Level of Government: expenditure

General Government Expenditure across Levels of Government, 2021 and 2022



Source: OECD National Accounts Statistics (database).

Purpose 2-1 Macroeconomic Stabilization

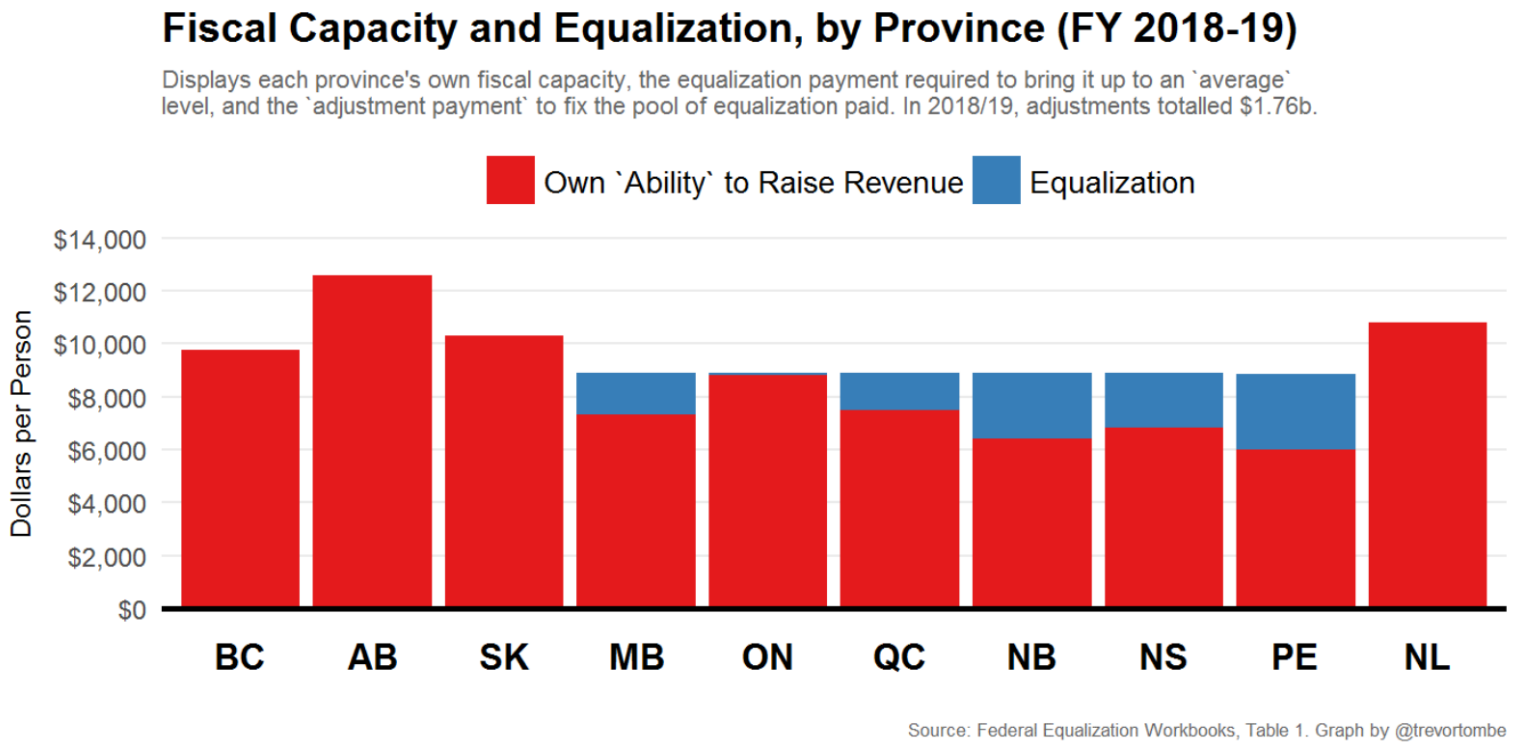
Different regions may be affected by different shocks at different times, because

1) a country's economic structure is geographically heterogeneous
    - e.g., more textile industry in one area, more tourism in the other
2) natural phenomena can influence local economies
    - e.g., droughts, hurricanes, earthquakes
3) the country's demographic structure is geographically heterogeneous
    - e.g., more youth in one area, more retirees in the other

Purpose 2-2 Inter-regional redistribution

So-called "equalization grants".

- How do we calculate a "fair" method to redistribute resources?
- Will those grants reach the desired objective of helping low-income residents?



Purpose 2-3 Spillovers and mobility

- In the presence of inter-jurisdictional externalities/spillovers, decisions of individual sub-national governments can be inefficient
- Migration among communities may impose extra costs on residents

If nonresidents benefit from a good/service provided by a local government, but their benefits are not taken into account when deciding on the amount provided, **social marginal benefits are underestimated** and sub-optimally low quantity is decided for.

Part 2 Conceptualization

SO!

Grants are important.

BUT...

What are they, specifically speaking?

How do we design them?

Today's Agenda

1. Stylized Facts and Motivation: Why grants?

2. Basic Framework: How to conceptualize grants?

    Types, Characteristics

Conceptualization: how to categorize grants

Four dimensions:

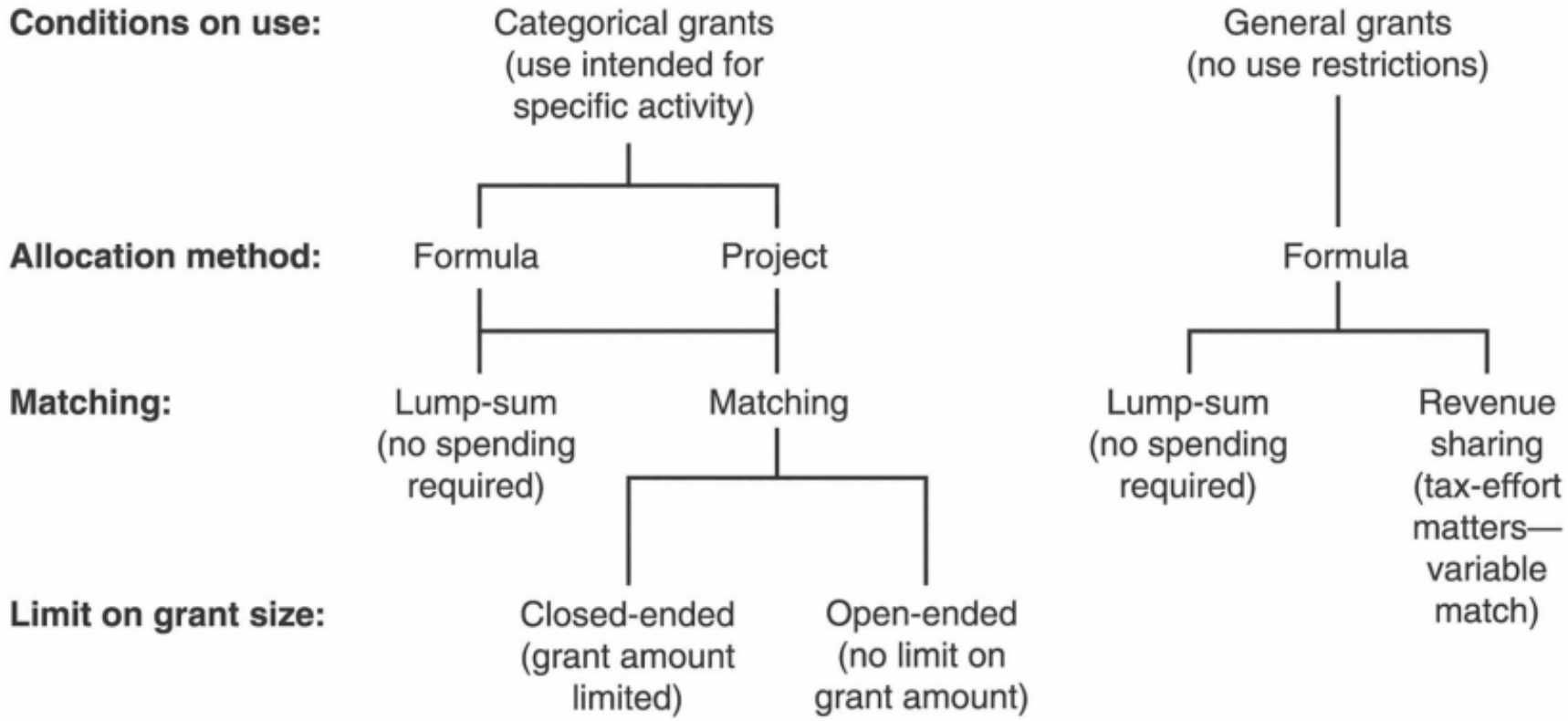


Figure 9.3 Types of intergovernmental grants

You can **categorize these grants differently**, according to the most important element in your analysis!

Scenario 1: Too many Darios

Dario is a (fiscal) resident in Madrid but comes to Barcelona every summer for a break.

- He enjoys free health services here!! (Barcelona is paying for him.)

A non-negligible number of "Dario"s → inefficient fiscal decisions of both Madrid and Barcelona

- Can use inter-govt grants to "correct" for this

In-class ***News Reading*** *(English translation in handout):* *https://govern.cat/salapremsa/notes-premsa/135733/boi-ruiz-demana-ana-mato-fons-compensacio-territorial-financar-atencio-sanitaria-dels-pacients-procedents-altres-comunitats-autonomes*

How should we design a grant?

Type 1: Categorical grants

- Conditions on use: **Categorical**/Activity-specific (e.g. education, health, environment...)
- Allocated based on
  - a formula (e.g. based on local wealth, resident counts, etc.)
  - a specific project (with an associated budget)
- Amount
  - Lump-sum
  - **Matching**: CG covering for xx% of the actual expenditure (either w/ or w/o an upper limit)

Scenario 2: COVID

COVID hits the country! SNGs are facing a large mismatch between rising costs and falling revenues.

> "*In addition to helping these governments address the revenue losses they have experienced as a result of the crisis, it will help them cover the costs incurred due to responding to the public health emergency and provide support for a recovery...*"
>
> "*Intergovernmental transfers were relatively high in 2020 because of federal spending in response to the COVID-19 pandemic. In 2020 and 2021, Congress transferred a large amount of funds to state governments as part of the CARES Act, the Coronavirus Response and Relief Supplemental Appropriations Act (part of the December 2020 omnibus bill), and the American Rescue Plan.* "

The central government will give grants to help SNGs bridge the sudden gaps in all aspects.

How should we design such a grant, according to the criteria above?

Design your transfer to deal with COVID

In-class practice: **3-min independent** thoughts!

Topic: How should we design such a grant?

SNGs are facing a gap between rising costs and falling revenues due to COVID. The central government will give grants to help bridge the gaps in all aspects. How will you design such a grant, according to the criteria above?

- Within 3 minutes, describe your grant(s) in these dimensions.
- Please briefly justify for your grant design.

To have a clear mind,
and know how to design a policy according a framework.

Discussion

Topic: How should we design such a grant?

SNGs are facing a gap between rising costs and falling revenues due to COVID. The central government will give grants to help bridge the gaps in all aspects. How will you design such a grant, according to the criteria above?

- Now **discuss** in groups of two or three.
- Compare and contrast your plan with your colleague's.

To have a structured mind,
be able to compare and contrast different policy recommendations.

What did they actually do?

"*In 2020 and 2021, Congress transferred a large amount of funds to state governments as part of the CARES Act, the Coronavirus Response and Relief Supplemental Appropriations Act (part of the December 2020 omnibus bill), and the American Rescue Plan.* "

The American Rescue Plan provides $350 billion in emergency funding for state, local, territorial, and Tribal governments:

- $195 billion for states, (a minimum of $500 million for each State);
- $130 billion for local governments (a minimum of $1.25 billion per state is provided by the statute inclusive of the amounts allocated to local governments within the state);
- $20 billion for tribal governments; and
- $4.5 billion for territories

Type 2: General grants

- Conditions on use: **General**/NOT activity-specific
- Allocated based on
  - a formula
- Amount
  - Lump-sum
  - **Revenue-sharing**: CG transferring xx% of some income to SNG

A side note: gaps between SNG revenue and expenditure are common in real life under specific revenue and expenditure responsibility sharing schemes a country adopts (not necessarily due to shocks like COVID.)

Additional: in-class discussion

Many of you may think that the grant should only be spent on several important areas

- **block** grants—between general and specific grants
  - used to provide broad support in a some area(s) of expenditures (e.g. health, education)
  - recipients still decide on how to allocate the funds for this general purpose

Summary: how to categorize grants

Four dimensions:

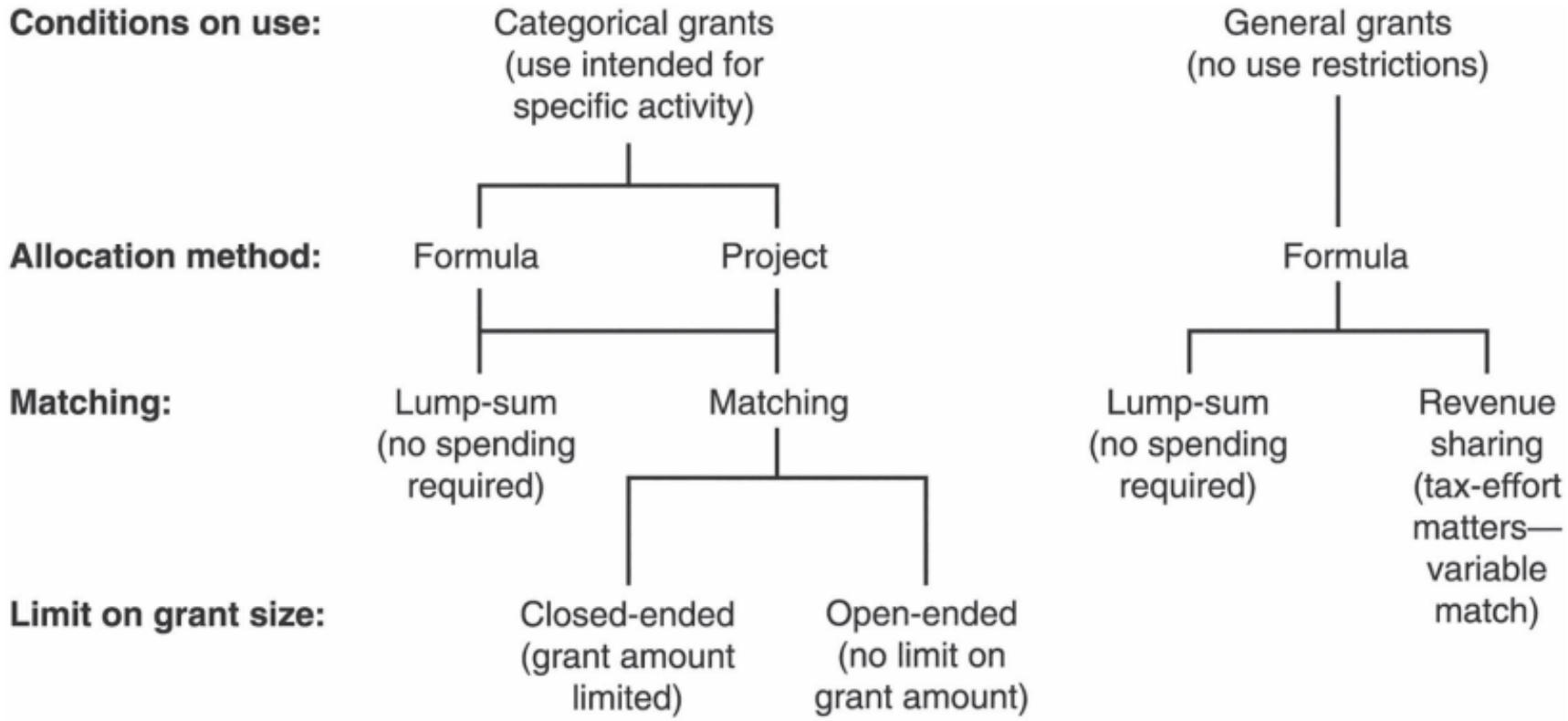


Figure 9.3 Types of intergovernmental grants

You can **categorize these grants differently**, according to the most important element in your analysis!

Matching & Revenue-sharing grants

- Both reflect "shared responsibility".
  - R: matching rate (or sharing rate)—1 euro spent or collected by the receiving government is "matched" with R euro grant money.
  - M: share of spending financed by the grant:

$$M = R/(1 + R)$$

- Reduce marginal price (cost) of local goods/services for the recipient government

$$P = 1 - M = \frac{1}{1+R}$$

Takeaways today

1. A sense of
    1. how important intergovernmental grants are and
    2. why we need them
2. Important characteristics of grants & how to categorize them accordingly

Intergovernmental Grants

Lecture 2 Effects of grants: theory

March 28, 2025

I thank Dirk Foremny, Zelda Brutti, and Candan Erdemli for useful materials compiled in previous years.

Reading for this lecture: **Chapter 9**: "Intergovernmental grants?"

State and Local Public Finance, by Ronald C. Fisher

Today's Agenda

1. Basic Framework: How to conceptualize grants?

   Types; Characteristics

2. Theoretical Analysis: effects of grants

   Setup; Theoretical predictions

Recall from last lecture

Four dimensions:

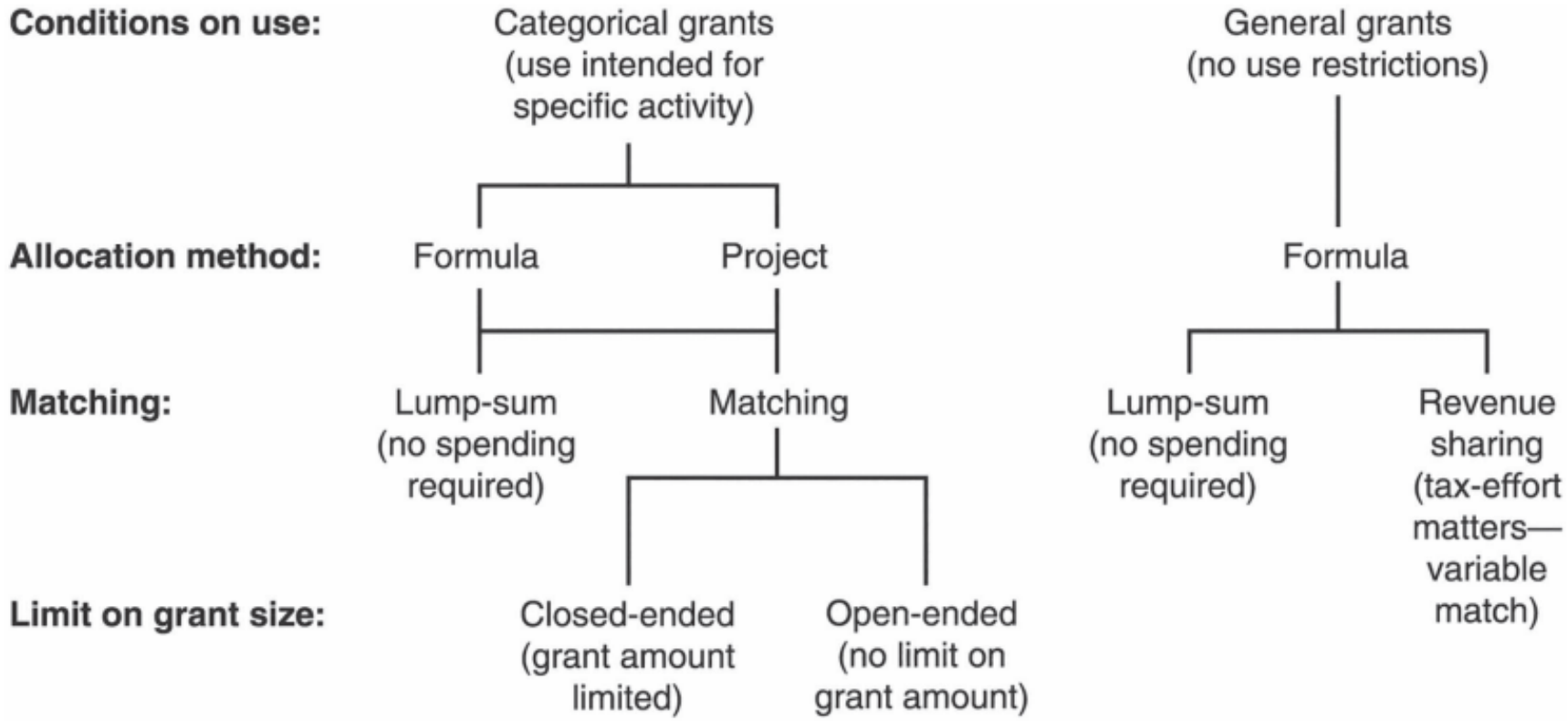


Figure 9.3 Types of intergovernmental grants

You can **categorize these grants differently**, according to the most important element in your analysis!

Economic Thinking: How to analyze the effect of grants?

1. Effects on what?—on consumption/utility/welfare...

Therefore, we need to use what you learned before: **Consumer Theory**

2. How to reflect the effect?

Equilibrium → Comparative Statics (*ceteris paribus*)

Recap: Consumer Theory

Setup:

- Commodity Set (Good 1 and Good 2)
- Budget Constraints (prices & income)—objective condition
- Indifference Curves (preference)—subjective condition

Equilibrium:

- $e^* = (X_1^*, X_2^*; p_1, p_2, I)$—optimal consumption level (X_1^*, X_2^*) under certain circumstances (p_1, p_2, I)

Comparative Statics: How does a change in the prices (p_1, p_2) or income (I) affect the optimal level of consumption (X_1^*, X_2^*)?

- E.g., $e^* = (X_1^*, X_2^*; \boldsymbol{p_1}, p_2, I) \rightarrow e^{**} = (\boldsymbol{X_1^{**}}, \boldsymbol{X_2^{**}}; \boldsymbol{p_{11}}, p_2, I)$

1. Framework: Back to consumer theory

Commodity Set: governmentally provided good G and a composite good X

- **Budget Constraint** (**AF:** slope representing this individual's tax price on G)
- **Indifference Curves**

Equilibrium: (X_0, G_0)

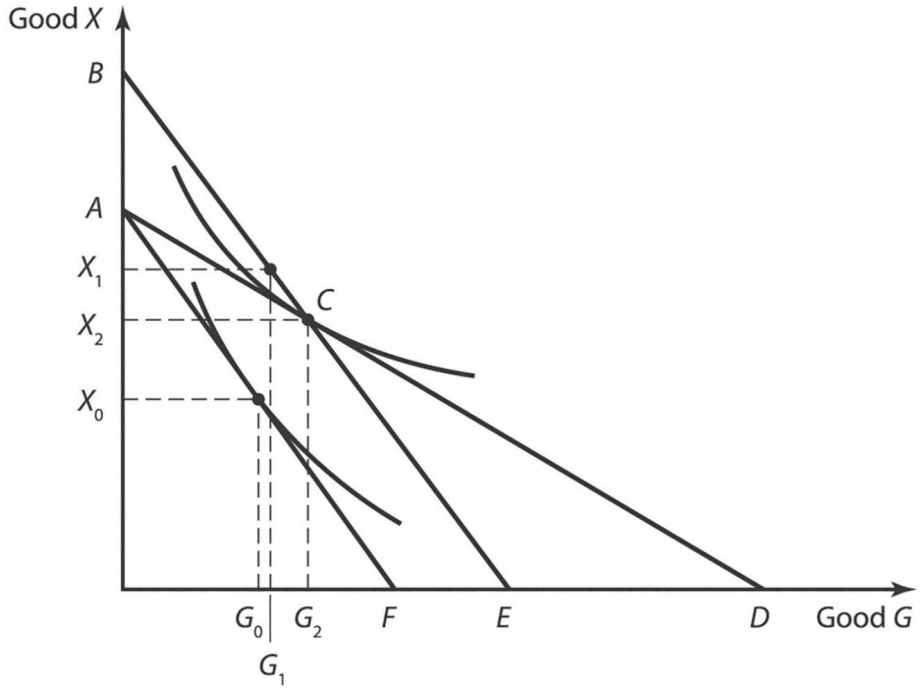


Figure 9A.1 A comparison of matching and lump-sum grants

1.1 Effect of a lump-sum grant

With a lump-sum grant, tax price (the citizen pays for each unit of public good provided by the local government) is not affected

- **Budget Constraint** AF → BE
- **Indifference Curve** (out)

Equilibrium: $(X_0, G_0) \rightarrow (X_1, G_1)$

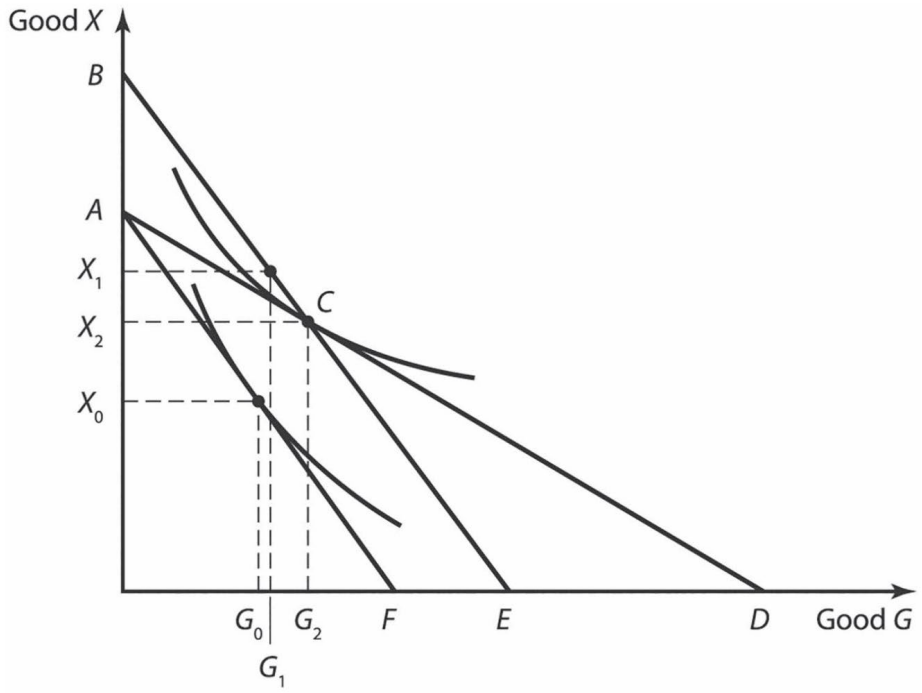


Figure 9A.1 A comparison of matching and lump-sum grants

1.2 Effect of an (open-ended) matching grant

With a matching grant, the price a citizen has to pay for each unit of public good provided by the local government) is reduced (because of the match: **from 1 to 1-M)**

- **Budget Constraint** AF → AD

Equilibrium: $(X_0, G_0) \rightarrow (X_2, G_2)$

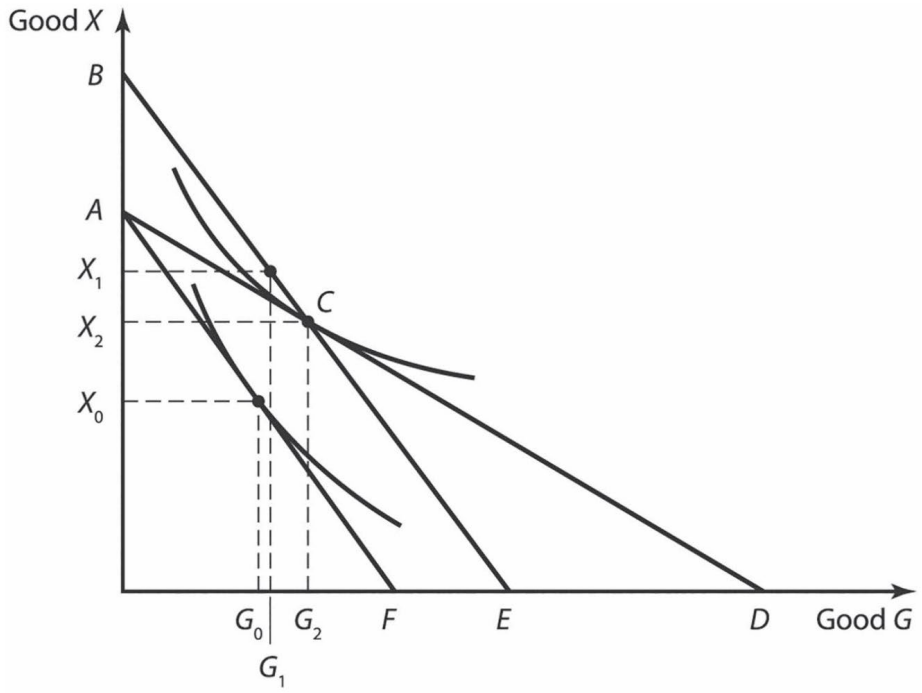


Figure 9A.1 A comparison of matching and lump-sum grants

1.2 Recall the decomposition of effects when prices change

Two main effects:

- **Income effect:**
  - ↑↑ the resources available
- Price effect ("**substitution effect**")
  - the product became cheaper relative to others

In-class exercise: solution

Decomposing the effect of an open-ended matching grant

Outline of steps

1. Rotate
2. Shift

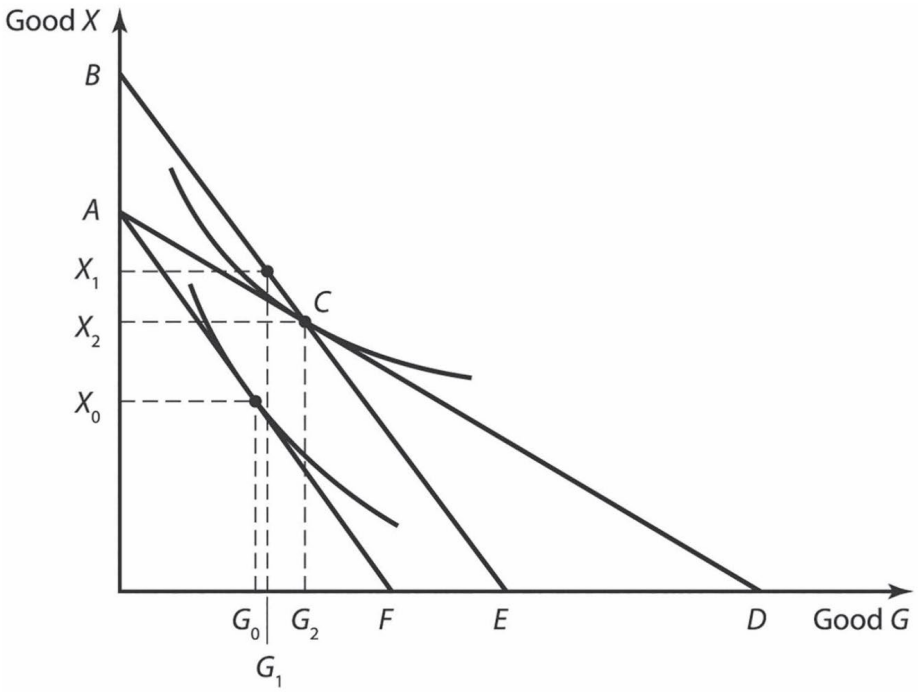


Figure 9A.1 A comparison of matching and lump-sum grants

Equilibrium: $(X_0, G_0) \rightarrow (X_2, G_2)$

In-class exercise

Decomposing the effect of an open-ended matching grant

Outline of steps (Illustration on white board)

1. Rotate
   1. AF out to AD (total effect) $G_0 \rightarrow G_2$
2. Shift
   1. AD → tangent to original U
   2. The tangent point (G_0^*) divides TE to income and price effects

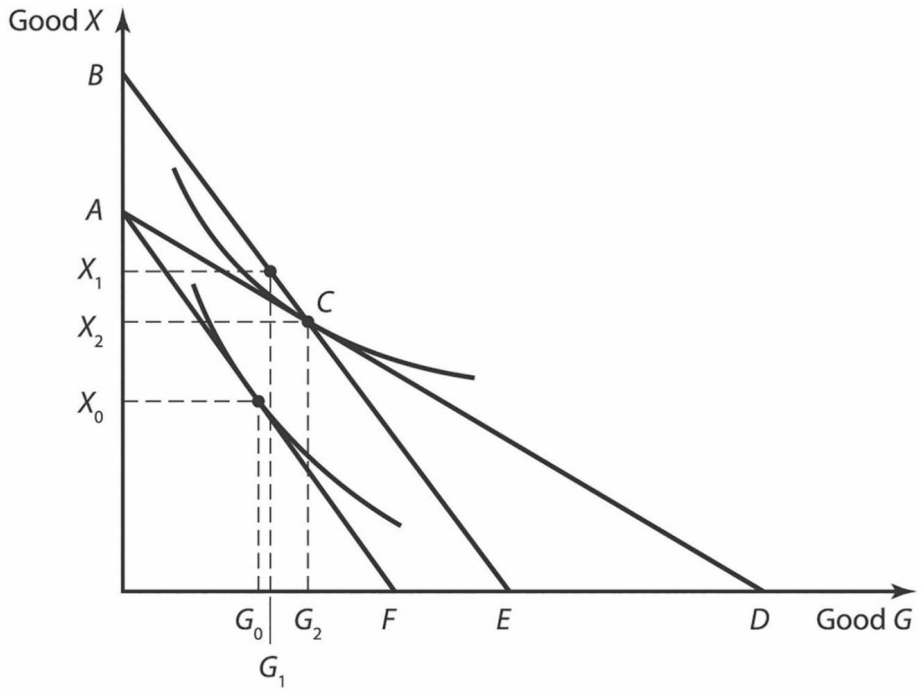


Figure 9A.1 A comparison of matching and lump-sum grants

Equilibrium: $(X_0, G_0) \rightarrow (X_0^*, G_0^*) \rightarrow (X_2, G_2)$

Effects comparison: lump-sum vs (open-ended) matching

What does this imply?

(fiscal effects of **lump-sum VS matching grants**)

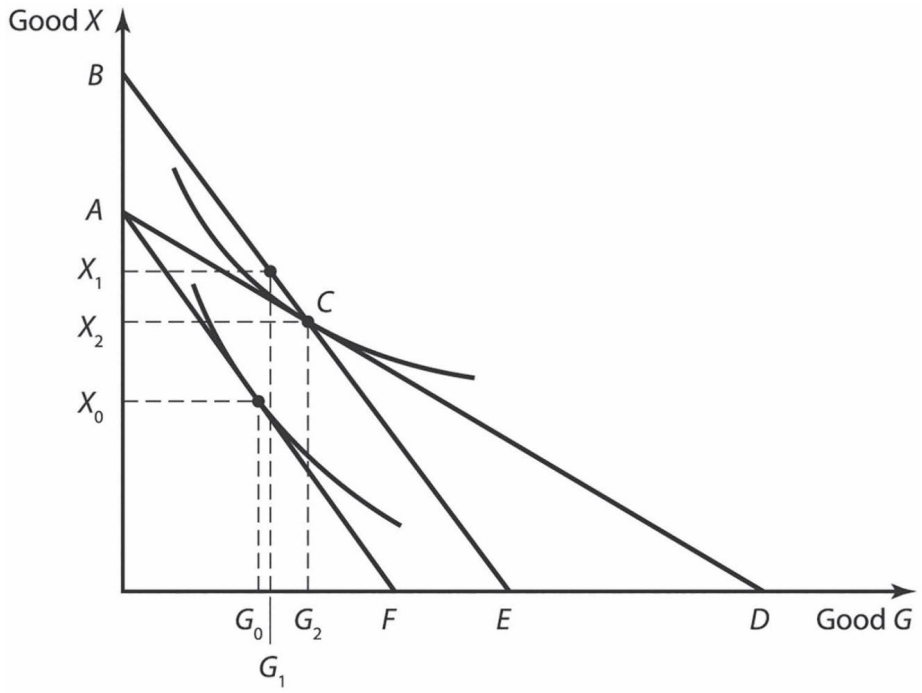


Figure 9A.1 A comparison of matching and lump-sum grants

Theoretical Predictions

Four important relationships between different types of grants.

1. **Matching grants are more stimulative than lump-sum grants.**

Recall from last lecture

Four dimensions:

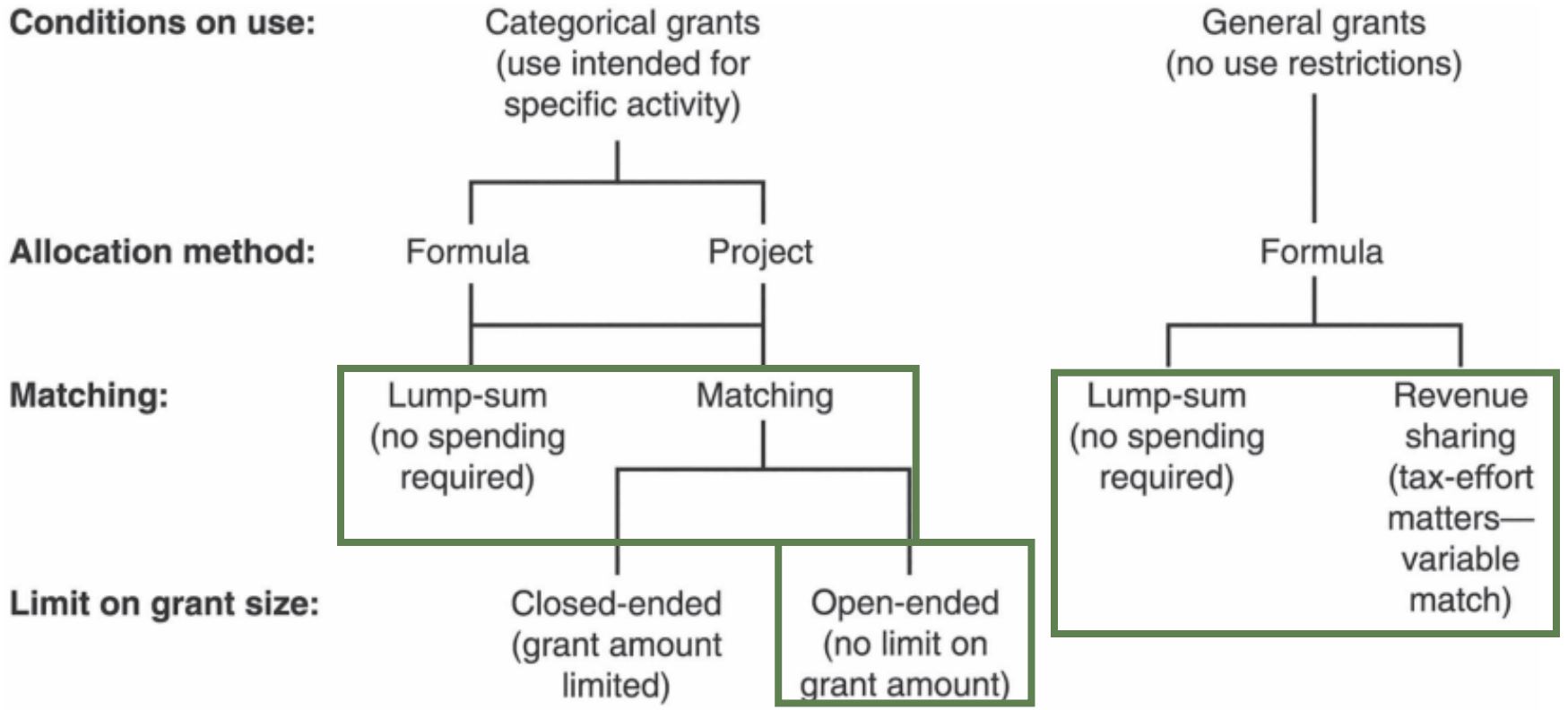


Figure 9.3 Types of intergovernmental grants

You can **categorize these grants differently**, according to the most important element in your analysis!

Sidenote: What about a CLOSE-ENDED matching grant?

The budget line facing the consumer is now **ACE**

- Beyond consumption level G_2 , the price of additional units of G returns to the original price with no grant.
- The utility maximizing bundle is at C; the consumer takes advantage of the full matching potential of the closed- ended grant.

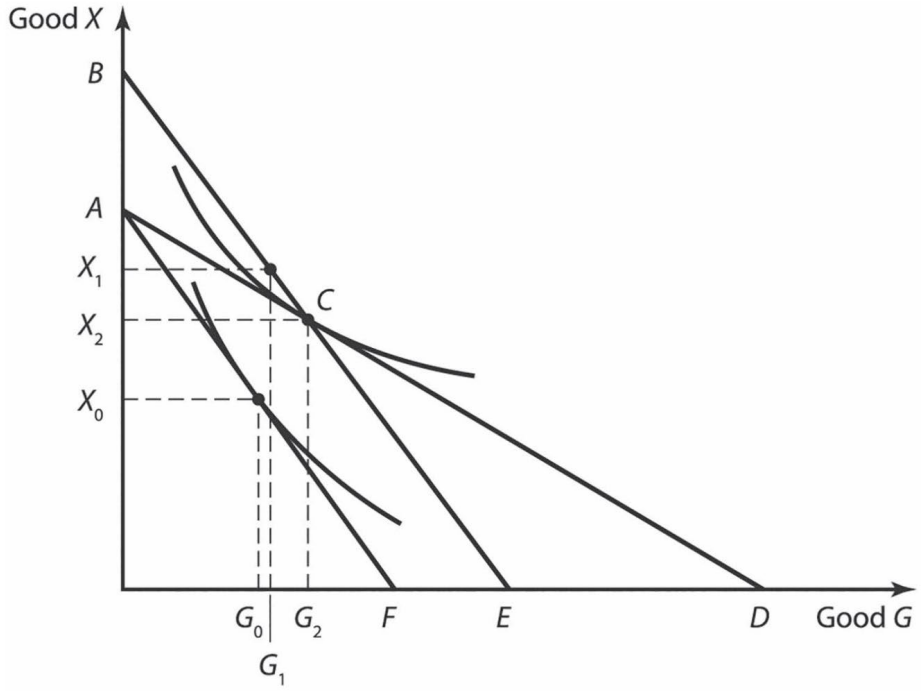


Figure 9A.1 A comparison of matching and lump-sum grants

Theoretical Predictions

Two important relationships between different types of grants.

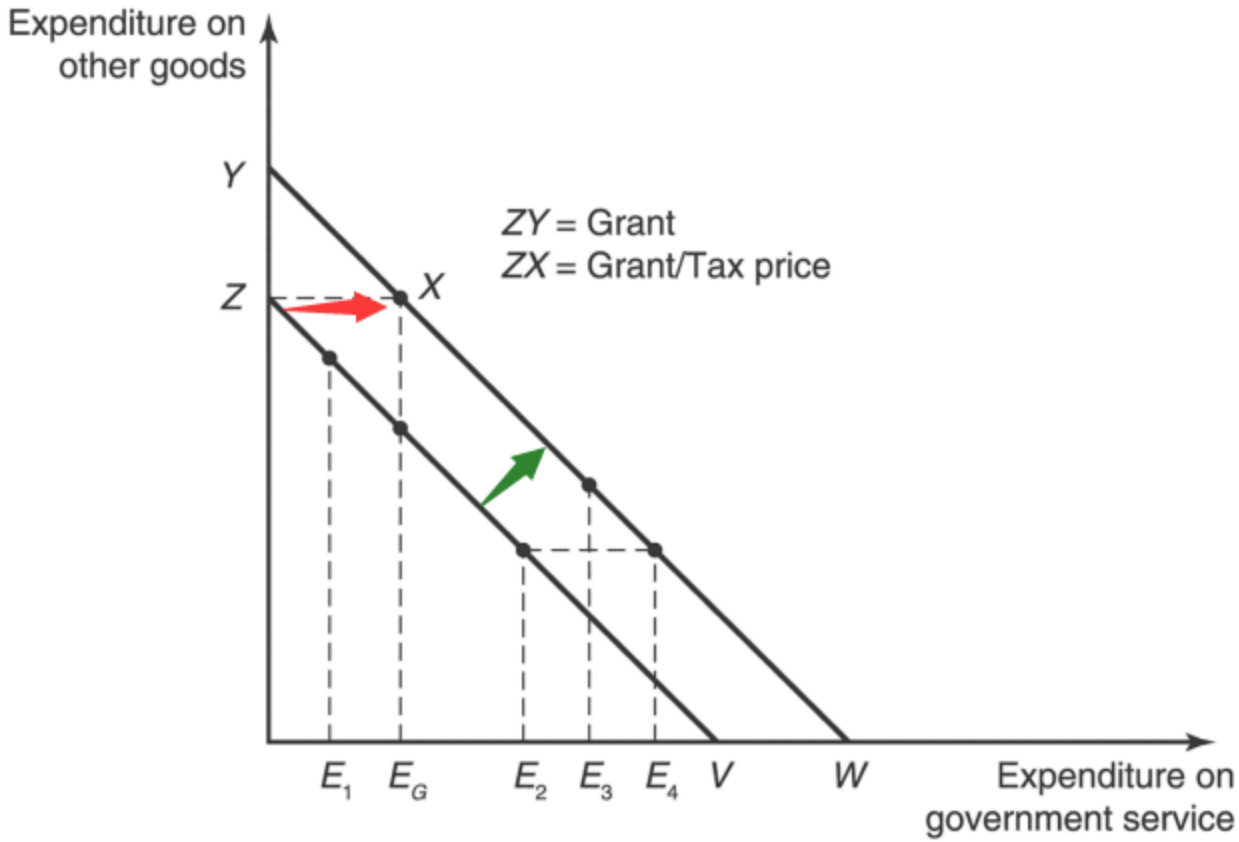
1. Matching grants are **more stimulative than** lump-sum grants. (numerical example next lecture)
   - increase government expenditure on the aided service by a greater amount than an "equal size" lump-sum grant
2. **Categorical lump-sum grants may be no different than general grants.**

3) Categorical lump-sum grants **may** be no different than general grants

A **general** lump-sum grant: ZV → YW (green arrow on the graph); money received can be spent on anything.

A **categorical** lump-sum grant of the same size: ZV → ZXW (red arrow on the graph); money received must be spent on the aided category.

- But the local government can react strategically.



Recall from last lecture

Four dimensions:

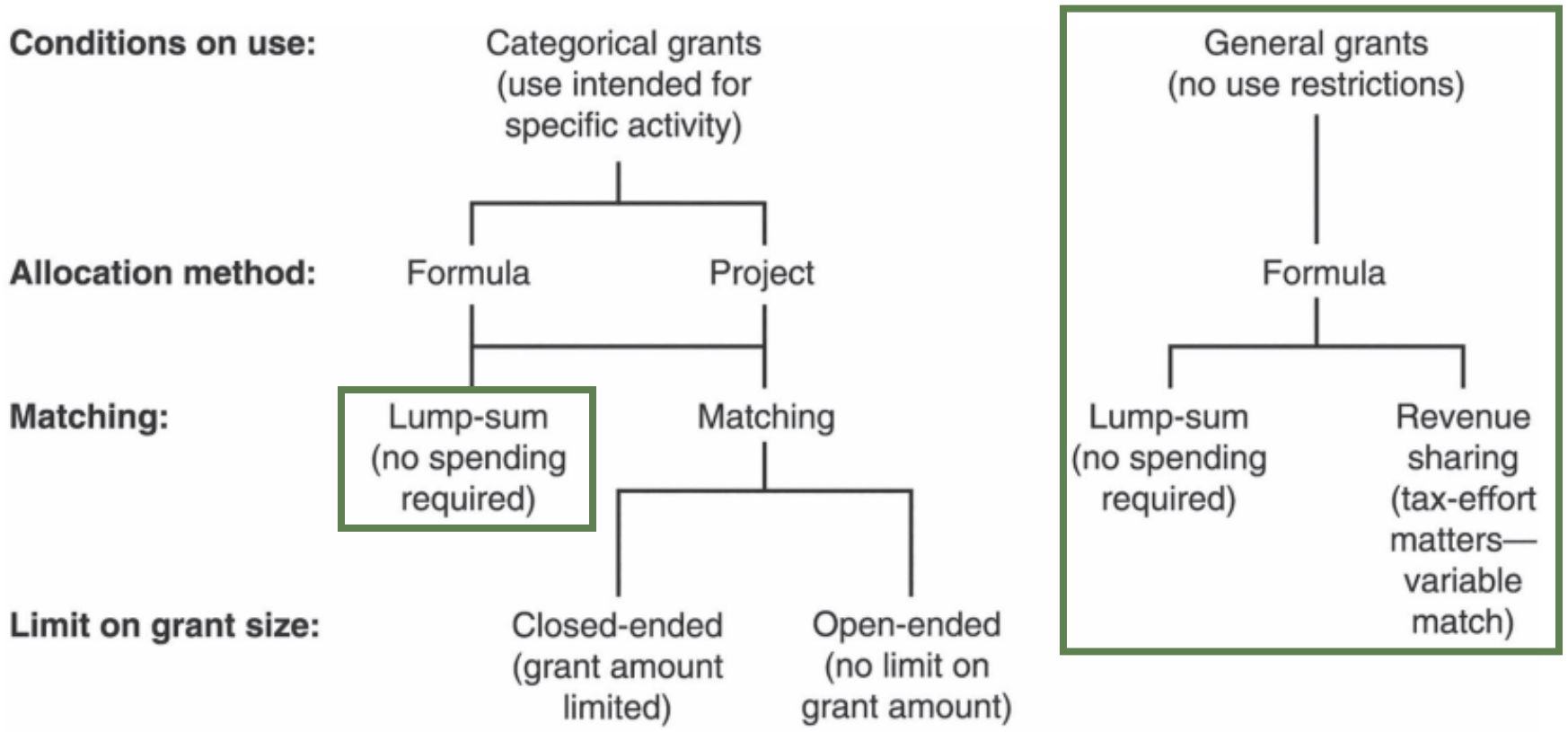


Figure 9.3 Types of intergovernmental grants

You can **categorize these grants differently**, according to the most important element in your analysis!

Fungibility

Suppose your parents give you a gift of €200, which they insist must be spent on books.

Even if you always obey your parents, does this mean you will spend €100 **more** on books this semester?

Not necessarily!

If you normally spend €200 per semester on books (own money), you might:

- increase it to €250 (the €100 gift, €150 own money) and
- shift your own €50 that would have been spent on books to some fancy meals.

How would you design a grant to avoid fungibility?

- a expenditure target on the specified service
- a requirement for maintenance of local effort on the specified service
- ...

Takeaways

1. Using consumer theory as a framework to analyze grants
2. Relationships among different types of grants

Intergovernmental Grants

Lecture 3 Effects of grants: numerical exercise

April 7, 2025

Reading for this lecture: **Chapter 9**: "Intergovernmental grants?"

State and Local Public Finance, by Ronald C. Fisher

Today's Agenda

1. Effects of grants
    1. Recap: Theoretical Predictions
    2. Numerical example: matching vs lump-sum grants (important!)
2. Problems of grants (empirical findings)
    1. Flypaper effect

Recap: types of grants

Four elements:

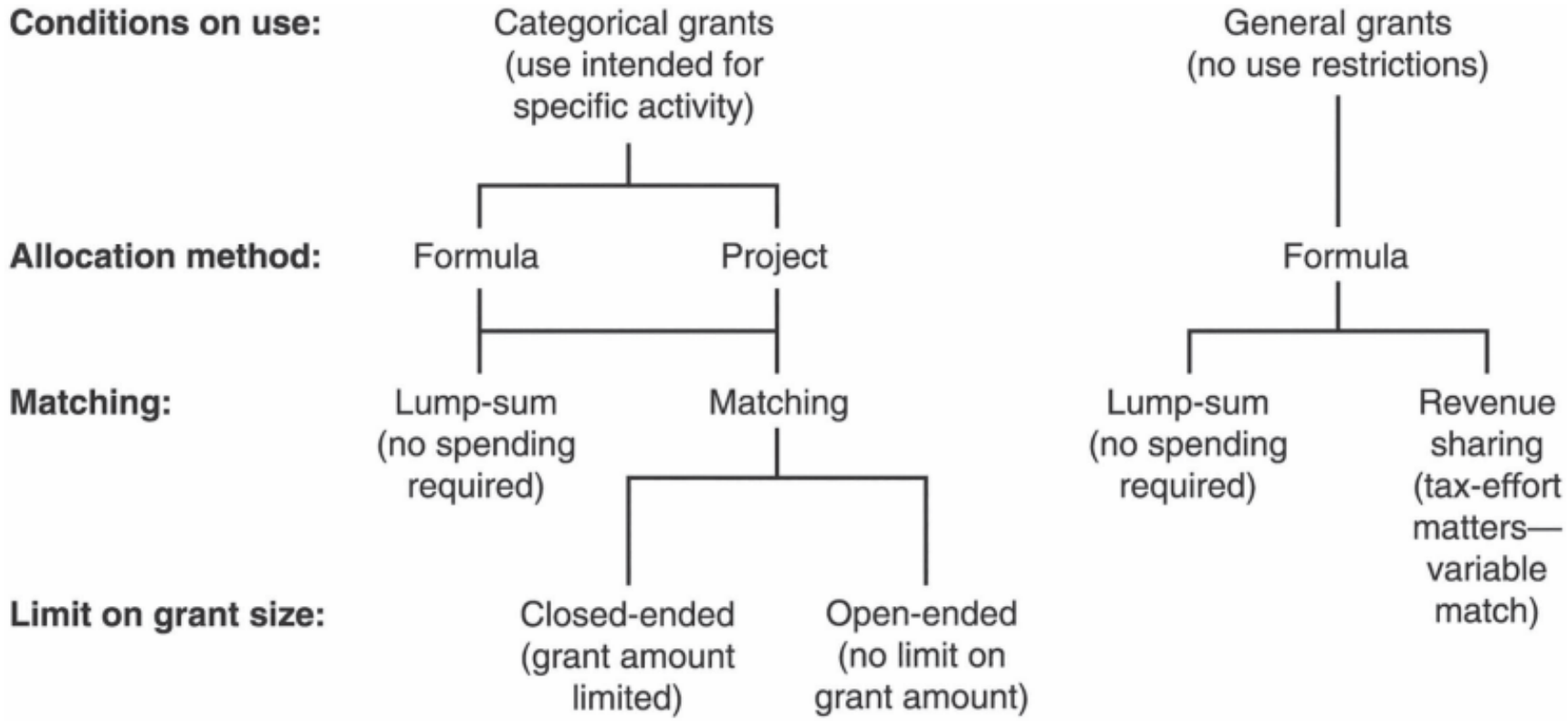


Figure 9.3 Types of intergovernmental grants

You can **categorize these grants differently**, according to the most important element in your analysis!

Recap: Modeling the effects of grants

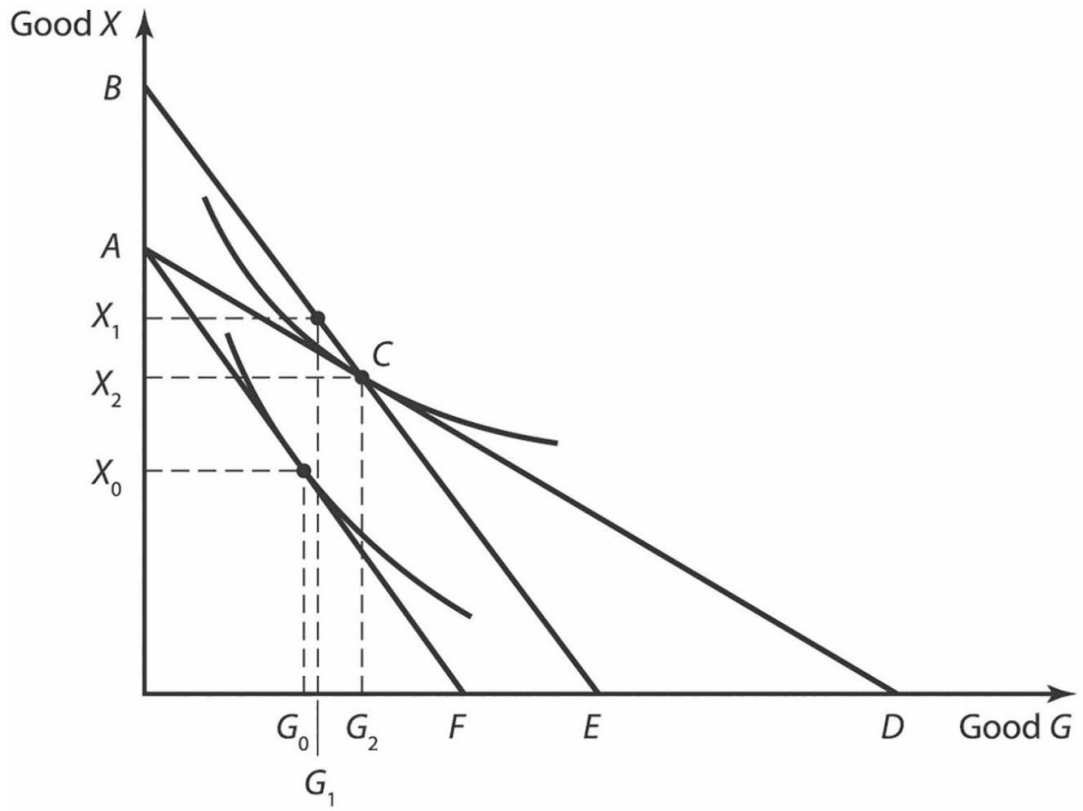


Figure 9A.1 A comparison of matching and lump-sum grants

Recall: Theoretical Predictions

1. **Matching grants are more stimulative than lump-sum grants.**
2. Categorical lump-sum grants may be no different than general grants.
3. **Matching grants provide tax relief.**
4. **Tax effort grants are matching.**

Extension 1: Close-ended matching grants

The budget line facing the consumer is now **ACE**

- Beyond consumption level G_2 , the price of additional units of G returns to the original price with no grant.
- The utility maximizing bundle is at C; the consumer takes advantage of the full matching potential of the closed- ended grant

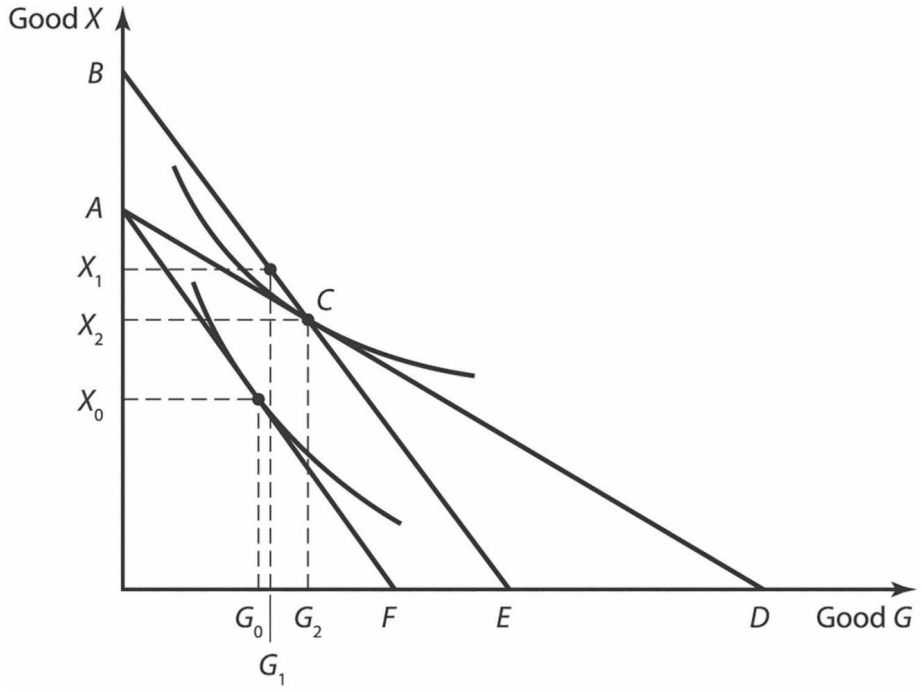


Figure 9A.1 A comparison of matching and lump-sum grants

Extension 2: Same results but with demand curves

Lump-sum - only income effect (E0 to E1)

- increases the recipient's utility more because the choice of consumption mix is not distorted by a price change.

Matching - income + substitution effects (E0 to E2)

- more effective at increasing consumption of G than an equal-size lump-sum grant:
- **increase government expenditure on the aided service by a greater amount than an "equal size" lump-sum grant**

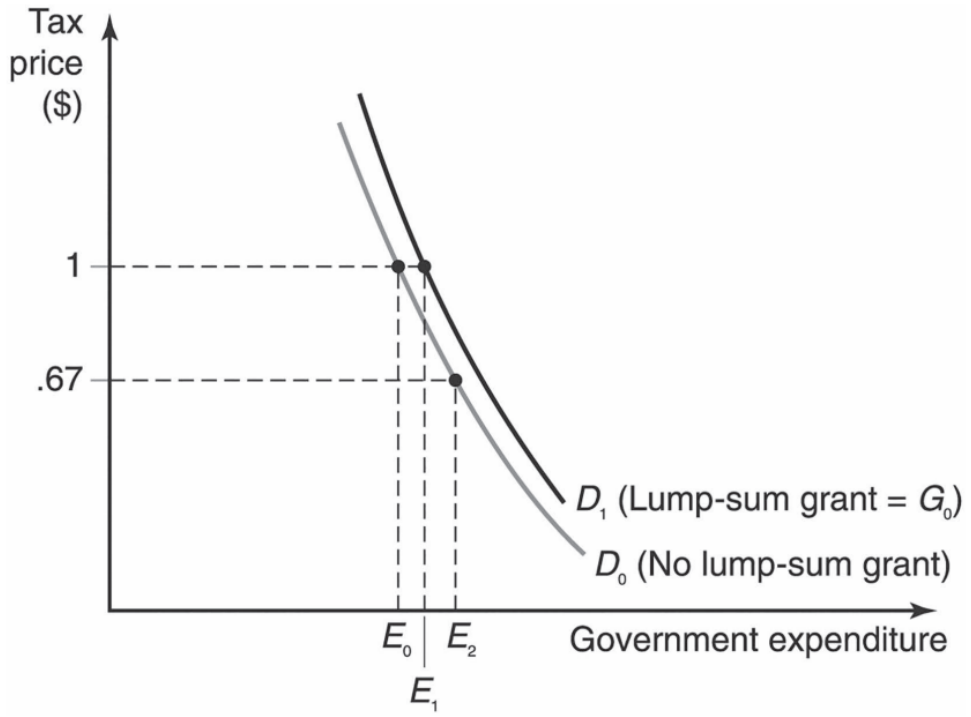


Figure 9.4 Income and price effects of a grant

"equal size": a lump-sum grant large enough to allow the government the same expenditure as selected with the matching grant.

Exercise: A numerical example—theoretical prediction 1 (A)

1. Matching grants are more stimulative than lump-sum grants.

Question

PART A: Assume initial spending and taxes of \$1,000 per capita and the price elasticity of demand for government expenditure equal to –0.5, a matching grant providing \$0.50 for each \$1 of local tax.

1) What is the reduced tax price (i.e., marginal cost)? How large is this decrease in percentage?
2) What is the level of spending on public goods after receiving the grant? How large is this increase in percentage?
3) What is the per-capita grant received?
4) To finance the remaining expenditure, what should the per-capita local taxes be?

Exercise: A numerical example—theoretical prediction 1

PART A: Assume initial spending and taxes of \$1,000 per capita and a price elasticity of demand for government expenditure equal to –0.5, a matching grant providing \$.50 for each \$1 of local tax.

1) What is the reduced tax price (i.e., marginal cost)? How large is this decrease in percentage?

Answer: The share of spending financed by the grant $M = R/(1+R) = 0.5/(1 + 0.5) = 1/3$, and reduce marginal price $P = 1 - M =$ \$0.67, or a 33% decrease.

2) What is the level of spending on public goods after receiving the grant? How large is this increase in percentage?

Answer: Given the price elasticity of demand of 0.5, per-capita expenditure will increase by (-0.33) x (-0.5) = 16.5%, from \$1,000 to \$1,165.

Exercise: A numerical example—theoretical prediction 1

PART A: Assume initial spending and taxes of \$1,000 per capita and a price elasticity of demand for government expenditure equal to –0.5, a matching grant providing \$.50 for each \$1 of local tax.

3) What is the per-capita grant received?

Answer: 1,165 × 1/3 = \$388.33.

4) To finance the remaining expenditure, what should the per-capita local taxes be?

Answer: 1,165 - 388.33 = \$776.67

Therefore, the effect of the matching grant is to increase per-capita expenditure by \$165 and to decrease local tax by \$223.33.

Exercise: A numerical example—theoretical prediction 1 (B)

"Matching grants are more stimulative than lump-sum grants."

Question

PART B: If this jurisdiction received a lump-sum grant equal to \$388.33 per capita and assuming per capita income of \$5,000 and an income elasticity of 0.5.

1) What is the level of spending on public goods after receiving the grant?
2) To finance the remaining expenditure, what should the per-capita local taxes be?
3) How are these effects compared to those in PART A?

Exercise: A numerical example—theoretical prediction 1

PART B: If this jurisdiction received a lump-sum grant equal to $388.33 per capita and assuming per capita income of $5,000 and an income elasticity of 0.5.

1) What is the level of spending on public goods after receiving the grant?

Answer: Increase in per-capita income is 388.33/5,000 = 7.76%. Percentage change of spending on public goods 7.76 x 0.5 = 3.88%, from $1,000 to $1,038.80.

2) To finance the remaining expenditure, what should the per-capita local taxes be?

Answer: 1,038.80 - 388.33 = $650.47.

Exercise: A numerical example—theoretical prediction 1 (A vs B)

PART A: Assume initial spending and taxes of $1,000 per capita and a price elasticity of demand for government expenditure equal to –0.5, a matching grant providing $.50 for each $1 of local tax.

PART B: If this jurisdiction received a lump-sum grant equal to $388.33 per capita and assuming per capita income of $5,000 and an income elasticity of 0.5.

3) How are these effects compared to those in PART A?

Answer:

	A: Matching grant	**B: Lump-sum grant**
per-capita **expenditure increase**	$165.00	$38.80
per-capita **local tax decrease**	$223.33	$349.53

Exercise: A numerical example—theoretical prediction 1

Table 9.2 Expenditure effects of matching and lump-sum grants

Initial fiscal circumstances			
Per capita expenditure	$1,000		
Per capita local tax	$1,000		
Price elasticity of demand	– 0.5		
Income elasticity of demand	0.5		
Per capita income	$5,000		
Grant conditions and effects			
Matching grants		*Lump-sum grants*	
Matching rate	0.50 ($.50 for each $1.00 of each tax)	Per capita grant amount	$388.33
Tax price with grant	$0.67 ($1.00/$1.00 + $.50)	Percentage increase in per capita income	7.76% ($388.33/$5000)
Percentage decrease in price	33%		
16.5%	Percentage increase in per capita expenditure		3.88%
$1,165.00	Per capita expenditure with grant		$1,038.80
388.33	Per capita grant		388.33
776.67	Per capita local tax		650.47
165.00	Increase in per capita expenditure		38.80
223.33	Decrease in local tax		349.53
388.33	Sum = grant amount		388.33

What about close-ended matching grants?

PART C: Suppose that a matching grant of \$0.50 is offered for each \$1 of local expenditure up to a maximum local expenditure of \$1,000 per capita. **The maximum grant is \$500 per capita**.

$$\text{Local Tax Price} = \begin{cases} \$0.67, \text{ if local per capita expenditure} < \$1{,}000 (\text{as in PART A}) \\ \$1.00, \text{ if local per capita expenditure} > \$1{,}000 \text{ (as in PART B)} \end{cases}$$

A government spending \$1,500 per capita on the specific aided function (composed of \$1,000 in local money and \$500 of grant) can increase per capita expenditure by \$1 with an extra \$.67 of local money. Once total per capita expenditure reaches \$1,500, the grant is at its maximum and is, therefore, a lump-sum grant.

An **important** question for you to think

Question

Suppose that a matching grant of \$0.50 is offered for each \$1 of local expenditure up to a maximum local expenditure of \$1,000 per capita. The maximum grant is \$500 per capita. The income elasticity of the demand for government expenditure is 0.5 and the price elasticity of demand for government expenditure is equal to –0.5.

(I) What will be the effects (per-capita expenditure increase and local tax reduction) if the government originally spends \$900 per-capita?

(II) Assuming a capita income of \$5,000, what will be the effects if the government originally spends \$2,000 per-capita on this specific program?

Theoretical Predictions

1. Matching grants:
    1. are more stimulative than lump-sum grants.
    2. **provide tax relief.**
2. Categorical lump-sum grants may be no different than general grants.

1.2 Matching grants provide tax relief

In the PART A of our example, the price elasticity of demand for the aided service is less than one (inelastic). Therefore, expenditures will increase by less than 33 percent, and local taxes can decline.

	A: Matching grant
per-capita **expenditure increase**	\$388.33
per-capita **local tax decrease**	\$223.33

This \$223.33

→ goes towards reducing local taxes (**tax relief!!!**)

→ or could be used on different goods / services

Theoretical Predictions

1. Matching grants:
    1. are more stimulative than lump-sum grants.
    2. provide tax relief.
    3. **Tax effort grants are matching.**
2. Categorical lump-sum grants may be no different than general grants.

1.3 Tax effort grants are matching (not lump-sum).

Tax effort: usually measured by tax revenue / income (%) or tax / taxable value (%).

Revenue-sharing: a higher tax effort by a subnational government generates a larger grant

Total amount of grant funds is fixed.

A recipient jurisdiction can increase its revenue-sharing grant by increasing taxes at a greater rate than other jurisdictions.

Revenue-sharing grant: an example

In effect, a "competition" between two jurisdictions

Table 9.3 Sample revenue sharing program

Feature	*Jurisdiction A*	*Jurisdiction B*
Population	50	50
Property tax	$500	$500
Taxable value	$5,000	$10,000
Effective tax rate – tax effort	10%	5%
Relative tax effort	1.50	0.75
$\frac{T_i / V_i}{\Sigma (T_i / V_i)}$		
Grant share	66.7%	33.3%
$\frac{RTE_i \times POP_i}{\Sigma (RTE_i \times POP_i)}$		
Grant (fund = $100)	$66.70	$33.30
Effect of property tax change		
New property tax	$500	$600
New relative tax effort	1.36	0.82
New grant share	62.5%	37.5%
New grant amount	$62.50	$37.50
Change in grant	– $ 4.20	+ $4.20
Percentage change in grant	– 6.3%	+ 12.6%
Price of tax increase	NA	$0.96

Deepening a bit the analysis: absolute value of elasticity

If $|e| < 1$, the expenditure increase from a matching grant is **smaller** than the grant (388.33<165)

- Room for tax relief

Table 9.2 Expenditure effects of matching and lump-sum grants

Initial fiscal circumstances			
Per capita expenditure	$1,000		
Per capita local tax	$1,000		
Price elasticity of demand	− 0.5		
Income elasticity of demand	0.5		
Per capita income	$5,000		
Grant conditions and effects			
Matching grants		*Lump-sum grants*	
Matching rate	0.50 ($.50 for each $1.00 of each tax)	Per capita grant amount	$388.33
Tax price with grant	$0.67 ($1.00/$1.00 + $.50)	Percentage increase in per capita income	7.76% ($388.33/$5000)
Percentage decrease in price	33%		
16.5%	Percentage increase in per capita expenditure		3.88%
$1,165.00	Per capita expenditure with grant		$1,038.80
388.33	Per capita grant		388.33
776.67	Per capita local tax		650.47
165.00	Increase in per capita expenditure		38.80
223.33	Decrease in local tax		349.53
388.33	Sum = grant amount		388.33

Empirical findings

1. Open-ended categorical matching grants do seem to increase expenditures on the aided category and do so by a larger amount than equal-size specific lump-sum grants (as predicted by theory).
   - the estimated price elasticities for most subnational government services are less than one (in absolute value)
2. **There is some evidence that close-ended categorical matching grants sometimes have greater expenditure effects than open-ended matching grants (contrary to theory)**
3. Lump-sum grants cause an increase in government expenditures (in most cases smaller than the grant; estimates with wide variance).
4. **An additional $1 of lump-sum g rant money has a greater effect on recipient government expenditure than a $1 increase in residents' incomes.**

Flypaper effect

Theoretically, unconditional grants should be equivalent to increasing directly local residents' income by the same amount (by reducing its own contribution)

But in reality, money paid to a government tends to "stick" in the public sector.

e.g.,

$1 of increased income typically increases SNG expenditure by about $0.05 to $.10;

$1 in lump-sum general grant appears to increase SNG expenditure by $0.25 to $0.50.

Flypaper effect

Implication: A \$1 grant will have very different allocation effects than a \$1 tax decrease by the granting government (which increases income by \$1)

Main explanation: bureaucrats seek to maximize the size of their budget.

- **Debate**: reflection of important characteristics of political behavior **or** incorrect or imprecise economic analysis.

(For further discussion, see "Is grant money different than tax money" in Chapter 9 of the Fisher book)

Takeaways

1. Using the demand curve concepts to quantify effects
2. the effects of lump-sum and matching grants: expenditure increase and tax relief
3. Lump-sum categorical and general grants may be equivalent, in the presence of fungibility
4. Competition among jurisdictions over tax-sharing grants
5. Flypaper effect

Summary of the Unit