LECTURE 11

TAX POLICY

Optimal Tax Mix and Optimal Tax Theory in Practice

Outline

- Criticisms of the optimal tax theory
- The optimal tax mix
- Optimal tax theory in practice

Criticism of optimal taxation

1. Optimal taxation ignores many factors which are important for fiscal policy, like horizontal equity, tax avoidance, administrative problems, or taxpayers' preferences towards different types of taxes.

   - The optimal taxation focuses on the vertical equity: taxes should be imposed subject to the taxpayers' incomes and their abilities to gain income.

   - Optimal taxes could be very difficult and expensive to collect and control, not mentioning the compliance costs for taxpayers.

Criticism of optimal taxation

2. Many solutions and conclusions of this theory can be reached in more intuitive way, without the need for sophisticated mathematical apparatus.

   - Governments, while designing tax systems, do not build models based on Bergson-Samuelson functions.

   - Any changes in tax systems are introduced slowly and gradually, with the objective to improve situation under Pareto optimality.

Criticism of optimal taxation

3. The optimal taxes' analysis do not give clear conclusions for fiscal policy.

   - Its results depend on the economic relations, which are difficult to study or measure in practice, and on information, which is not accessible.

   - It is relatively easy to introduce a small change giving a Pareto improvement, but very difficult to run a complex reform of tax system.

   - Often we cannot translate the results of optimal taxation models into precise, practical political actions.

Optimal Tax Mix

- Optimal nonlinear income tax
  - Levied on observable income derived from hours of work.
- Optimal commodity tax
  - Levied on observable expenditure on consumption.
- Is there a need for both?
- From a lifetime perspective, savings are future consumption. Consumption must equal income, therefore a tax on the value of consumption is equivalent to a tax on income.

One-consumption-good world

$$px = z$$

Income tax $$px = z - T(z)$$

Consumption tax $$\boldsymbol{px + \tilde{T}(px) = z}$$

$$\boldsymbol{\tilde{T}(px(z)) = T(z)}$$

Tax equivalence:
Tax on the value of consumption
is equivalent to a tax on gross income.

Two-consumption-goods world

- With a single consumption good, the above apply.
- When there are two or more consumption goods, commodity taxes need not be uniform.
- Central question “Should there be differential commodity taxation in combination with a nonlinear tax?”

Basic intuition

- Commodity taxation can usefully complement income taxation if it reduces the distortion in the labour-consumption choice induced by the income tax.
- Tax commodities that are substitutes to work
- Subsidize commodities that are complements to work

 we encourage people to work more and thus reduce the work-discouraging effect of the income tax.

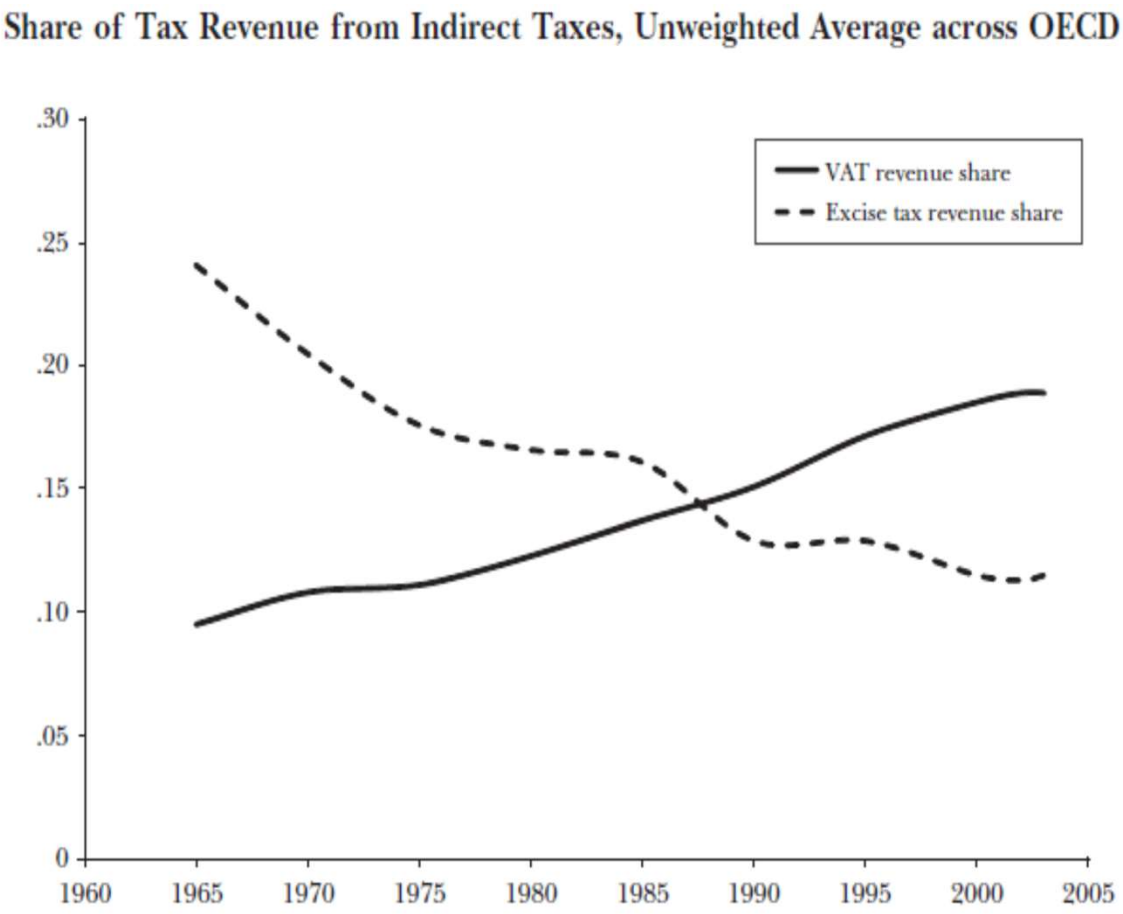
Basic intuition

- The optimal differentiation of commodity taxes depends on how the preferences for some goods vary with labour supply.
- If the preferences between commodities do not vary with labour supply, there is no argument for differential commodity taxes (separable preferences).

Intuition behind separability result

- With separable preferences, there is no information about unobserved ability in an individual's consumption choice that is not also revealed by the individual's income.
- The intuition for uniform commodity taxation is that, whatever the optimal distribution of after-tax income across individuals, the disincentive effects of achieving it are minimized if individuals' consumption choices are undistorted.

What happens in practice?



OECD countries have shifted towards VAT as a source of revenue as opposed to differentiated excise taxes. Nevertheless, value-added taxes are loaded with exceptions that violate the guidelines of optimal tax policy.

Another consideration: the role of demographics

- What happens if preferences differ across households with respect to (not labour supply) demographic characteristics?
- Particularly significant because arguments in favour of the zero-rating or lower VAT rates on certain goods is that they form a large part of the budget of particular demographic groups.
- For example, zero-rating or lower VAT rate on food and children's clothing can be justified by the fact that families with large number of children are prone to poverty and spend a high proportion of their budgets on these items.

Another consideration : the role of demographics

- Deaton and Stern (1986) show that uniform commodity taxation is still optimal if preferences are separable, provided that we can design an optimally chosen payment to each demographic group.
- Intuition: redistribution between demographic groups is achieved more efficiently by the use of direct payments to households, leaving the sales taxes to deal with efficiency problems.

Another consideration : the role of demographics

- Ebrahimi and Heady (1988) provide numerical results for the UK on this issue.

  "Is it better to abolish the zero-rating of food and use the funds to finance an increase in the child benefit?"

They study several *revenue-neutral* reforms.

Assumptions: all revenue is raised by sales taxes (equivalent to an income tax)

Another consideration : the role of demographics

Optimal Sales Taxes with Child Benefit ($\varepsilon = 1$)

	(1)	*(2)*	*(3)*	*(4)*
Tax on energy	30%	41%	28%	35%
Tax on food	34%	40%	32%	37%
Tax on clothing	52%	41%	55%	42%
Tax on other goods	44%	40%	49%	46%
Lump sum (per week)	£28	£28	£57	£56
Child benefit (per week)	£22	£22	0	0

Notes: Column (1) is based on the estimates from Blundell and Walker (1983).
Column (2) is the same as column (1) but separability had been imposed.
Column (3) is the same as column (1) but there is no child benefit.
Column (4) is the same as column (2) but there is no child benefit.

Column (1) : what is the optimal pattern of sales taxes, if lump-sum payments and the child-benefit are set optimally (we allow for non-separability). Result: Tax rates are non-uniform (because of the non-separability assumption)

Another consideration : the role of demographics

Optimal Sales Taxes with Child Benefit ($\varepsilon = 1$)

	(1)	*(2)*	*(3)*	*(4)*
Tax on energy	30%	41%	28%	35%
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Column (4) is the same as column (2) but there is no child benefit.

Column (2) : what is the optimal pattern of sales taxes, if lump-sum payments and the child-benefit are set optimally (we do not allow for non-separability). Result: Tax rates are close to uniform (because of the separability assumption)

Another consideration : the role of demographics

Optimal Sales Taxes with Child Benefit (ε = 1)

	(1)	*(2)*	*(3)*	*(4)*
Tax on energy	30%	41%	28%	35%
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Column (3) : what is the optimal pattern of sales taxes, if lump-sum payments are set optimally (we allow for non-separability and there is no child-benefit). Result: substantial non-uniformity.

Another consideration : the role of demographics

Optimal Sales Taxes with Child Benefit (ε = 1)

	(1)	*(2)*	*(3)*	*(4)*
Tax on energy	30%	41%	28%	35%
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Column (4) : what is the optimal pattern of sales taxes, if lump-sum payments are set optimally (we do not allow for non-separability and there is no child-benefit). Result: still substantial non-uniformity, even if separability is satisfied.

Optimal tax mix: conclusions

- The results obtained are in the world of theory.
- In the real world, the administration costs of taxes and the risk of evasion also determine the tax mix.
- VAT for example has low administration costs and makes evasion easy to detect.
- The income tax has high collection costs and is easier to evade.
- It may be better to collect part of the tax revenues through indirect taxes.
- In practice, in many developing countries (and Greece!) weak tax authorities find it hard to collect the income tax and inevitably rely on indirect taxation to finance public expenditure.

Optimal Tax Theory in Practice

- The theory and practice of taxation have not always followed parallel paths.
- Overall tax policy has moved in the directions suggested by theory along a few dimensions, even though theory does not always give precise prescriptions.
- We put forward a few general lessons suggested by optimal tax theory on income and commodity taxation and discuss whether they are consistent with actual tax policy.

Lesson 1: Optimal Marginal Tax Rate Schedules Depend on the Distribution of Abilities

- Rationale:
  - Consider an increase in the marginal tax rate at a given level of income.
  - This tax hike has an efficiency cost because it discourages the individuals who earn that income from exerting effort (marginal tax rate raised)
  - But the tax change is non-distortionary for individuals who earn higher incomes (average tax rate raised).
  - The tax rate increase raises revenue from the upper part of the income distribution that can be used to finance transfers to poor individuals, yielding an equality benefit.

Lesson 1: Optimal Marginal Tax Rate Schedules Depend on the Distribution of Abilities

- Rationale:
  - These factors suggest a cost–benefit analysis that applies to any proposal to alter the schedule of marginal tax rates.
  - An increase in a marginal tax rate is more attractive when few individuals would be affected at the margin and many would be affected inframarginally.
  - Therefore, to strike the right balance between efficiency and equality, the marginal tax rate schedule must be tailored to the shape of the ability distribution.

Lesson 1: Optimal Marginal Tax Rate Schedules Depend on the Distribution of Abilities

- Lesson for policy makers:

  Too broad and nonspecific to be of direct help to practical policymakers. But it lays a foundation for the next few lessons

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

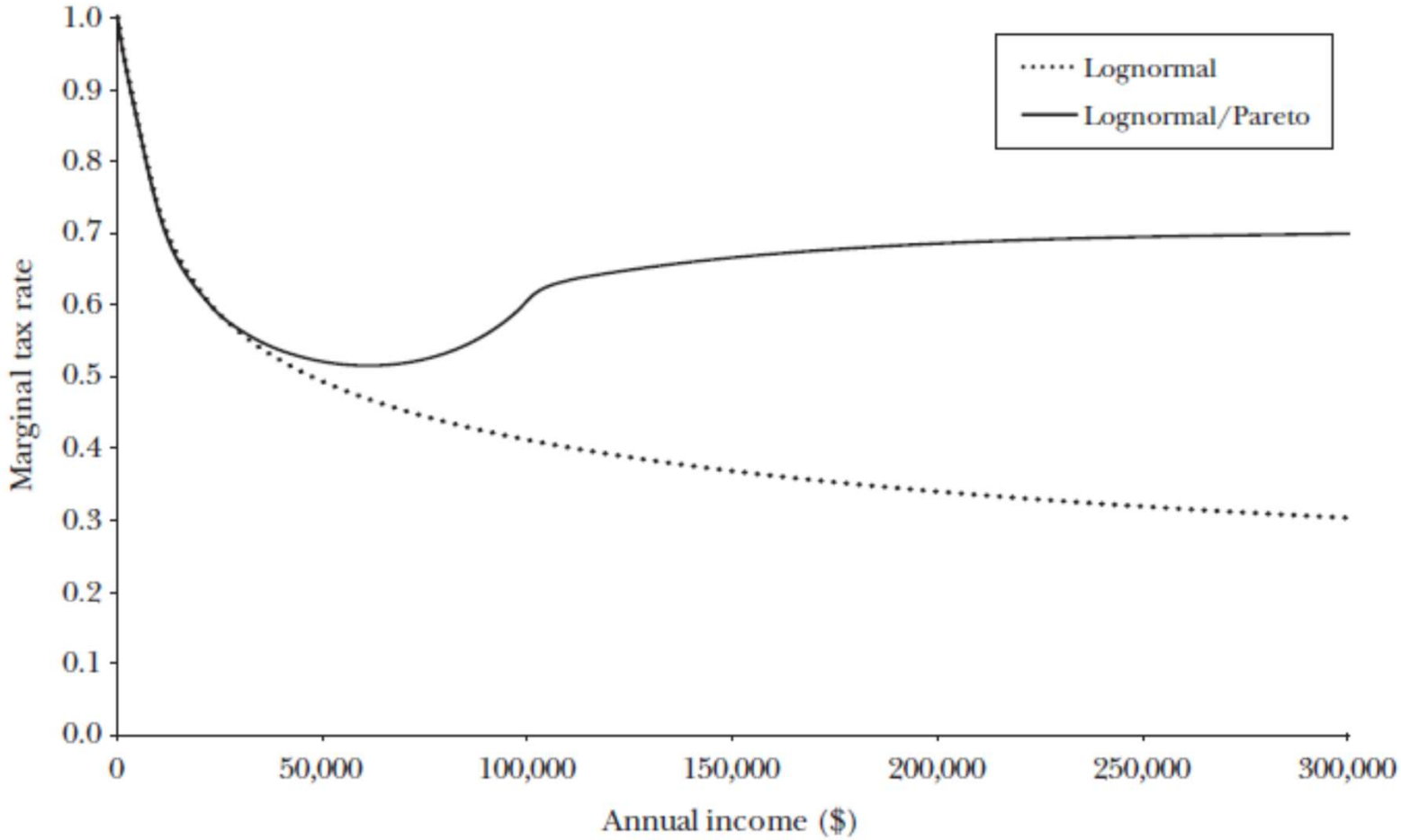
- Rationale:
  - Explained in class during the previous lecture!
  - The intuition behind the zero top rate result suggests that an important task for policy analysis is to identify the shape of the high end of the ability distribution.
  - In Tuomala's (1990) simulations, the efficiency costs of redistribution are large for much of the high end of the income distribution, justifying declining rates for a broad range of high incomes.
  - These results suggest that the zero top rate result was an instructive, if extreme, illustration of the power of incentive effects to counteract redistributive motives in setting marginal rates on high earners.

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

- Rationale:
  - In contrast, Saez (2001) also carried out numerical simulations and concluded, in dramatic contrast to earlier results, that marginal rates should rise between middle- and high-income earners, and that rates at high incomes should "not be lower than 50% and may be as high as 80%".
  - The primary difference between these findings seems to reside in the underlying assumptions about the shape of the distribution of ability.
  - Tuomala assumed a lognormal distribution, whereas Diamond and Saez argued that the right tail is better described by a Pareto distribution, which is thicker than a lognormal at high values (i.e. there are more high-income people)

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

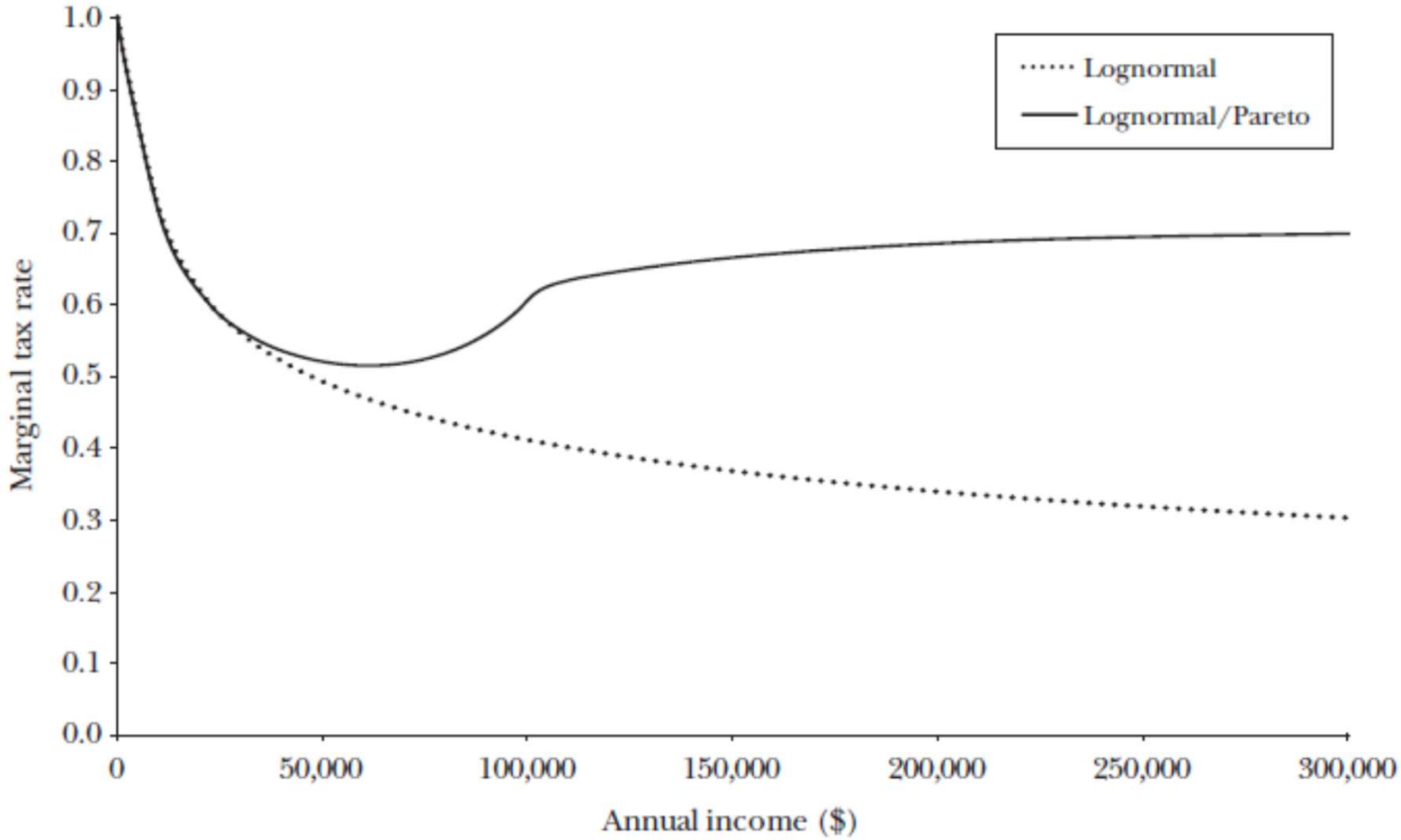
Optimal Marginal Tax Simulations, with Different Ability Distributions



Note: The figure shows optimal marginal tax rates given two different ability distributions: one lognormal; and one lognormal until approximately $43 per hour and Pareto thereafter.

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

Optimal Marginal Tax Simulations, with Different Ability Distributions



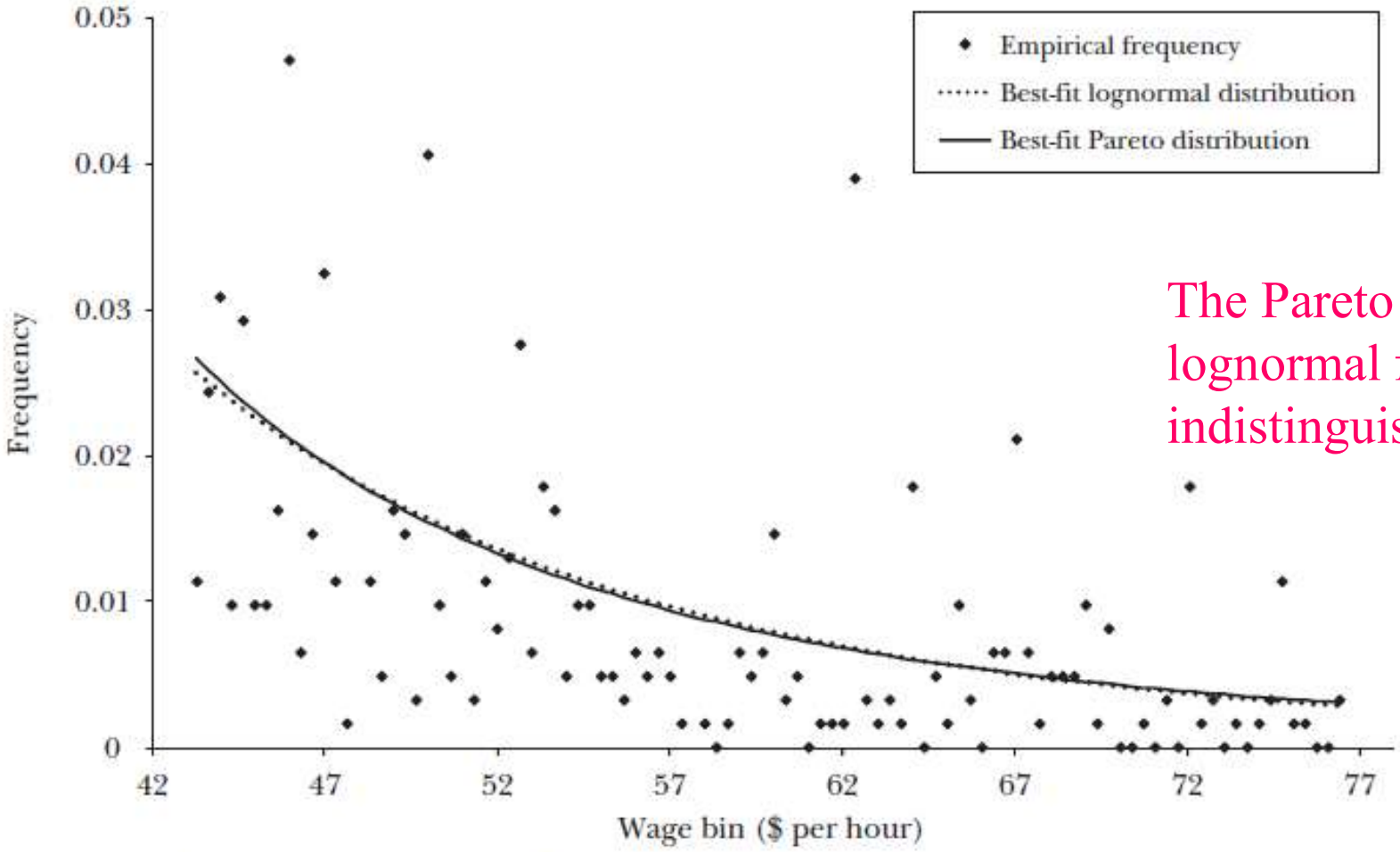
Note: The figure shows optimal marginal tax rates given two different ability distributions: one lognormal; and one lognormal until approximately $43 per hour and Pareto thereafter.

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

- In practice:
  - Very difficult to estimate the distribution of abilities.
  - Alternative approach: use wages as a proxy for ability. But, hourly wages are not a straightforward concept at the top of the distribution (labour and capital income?)

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

Right Tail of the U.S. Wage Distribution, 2003



The Pareto and the lognormal fits are indistinguishable!

Source: The data are from the Current Population Survey rotating March sample.

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

- In practice:
  - Even if the shape of the ability distribution is known, what is the appropriate social welfare function?
  - What are the labour supply elasticities at the top?

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

Table 1: Revenue-maximizing top rates for a selection of countries

Country	Pareto parameter[a]	Effective top rate[b]	Optimal top rate $\varepsilon = 0.3$	$\varepsilon = 0.15$	$\varepsilon = 0.45$
Australia	1.89	0.45	0.64	0.78	0.54
France	2.54	0.62	0.57	0.72	0.47
Germany	1.61	0.47	0.67	0.81	0.58
Netherlands	3.35	0.54	0.50	0.67	0.40
Spain	2.04	0.40	0.62	0.77	0.52
United Kingdom	1.77	0.52	0.65	0.79	0.56
United States	1.58	0.43	0.68	0.81	0.58

[a] Pareto parameters apply to most recent estimates (2007-2010) and were extracted from the World Top Incomes Database: http://topincomes.g-mond.parisschoolofeconomics.eu/, except for the Netherlands (2006), which comes from Zoutman et al. (2011a).

[b] Top rates are the total tax wedges (including employer contributions) in 2011 on the incomes of a single worker earning 167% of the average wage and are taken from the OECD: http://www.oecd.org/tax/taxpolicyanalysis/Table. Indirect taxes apply to 2003-2006 and are taken from OECD $\frac{\text{indirect tax}}{\text{rect tax}}$.

Source: Jacobs (2013)

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

- In practice, debate on:
  - The distribution of abilities
  - The form of the social welfare function
  - The true pattern of elasticities (possibly different for different kinds of people)

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

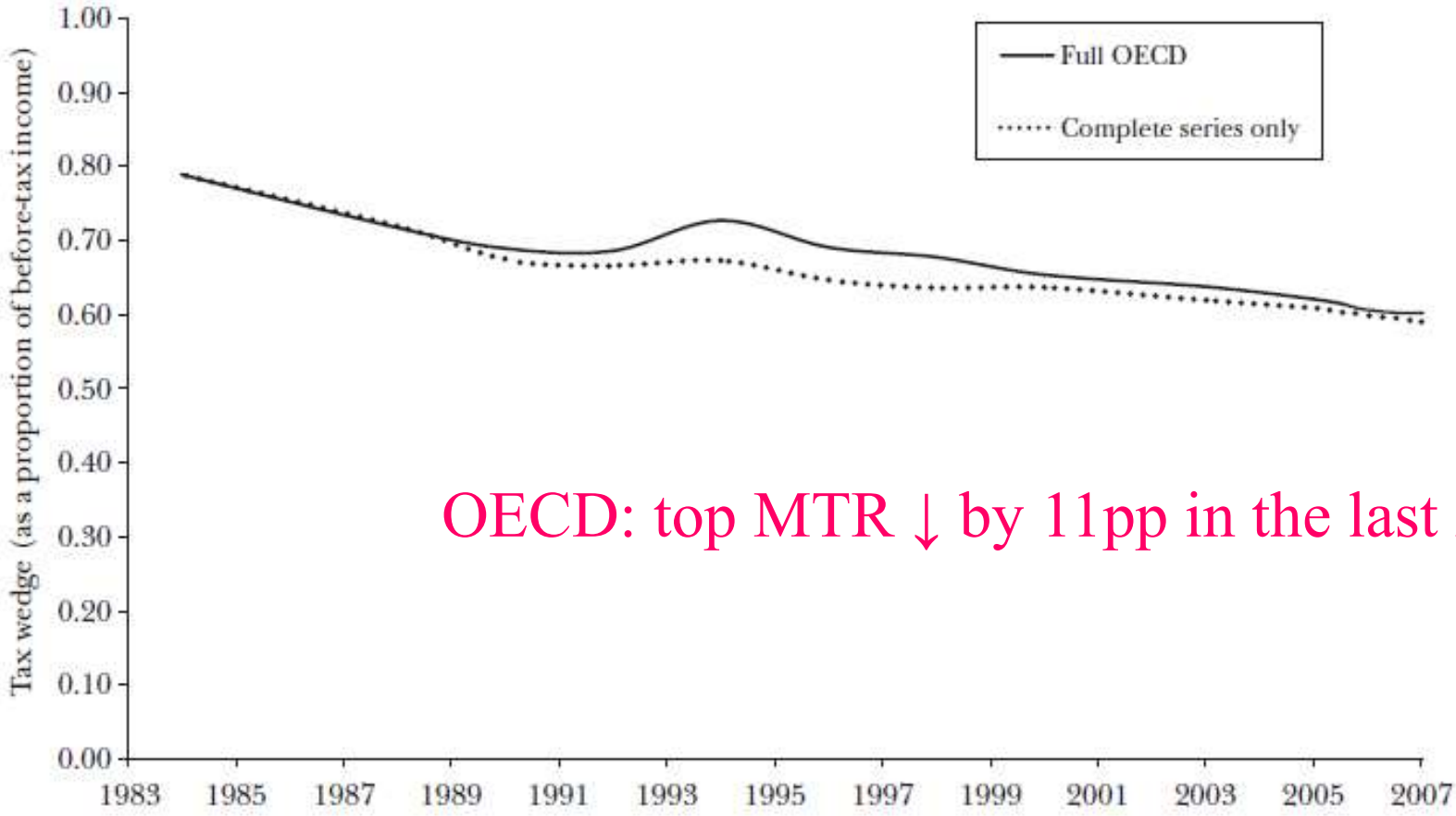
- Lesson for policy makers:

  Policy advisor in an uncomfortable position. Old and recent theoretical results are contradicting. Many key assumptions are open to debate.

Lesson 2: The Optimal Marginal Tax Schedules Could Decline at High Incomes

- What have countries done in practice?

Top Marginal Tax Wedge, OECD 1984–2007

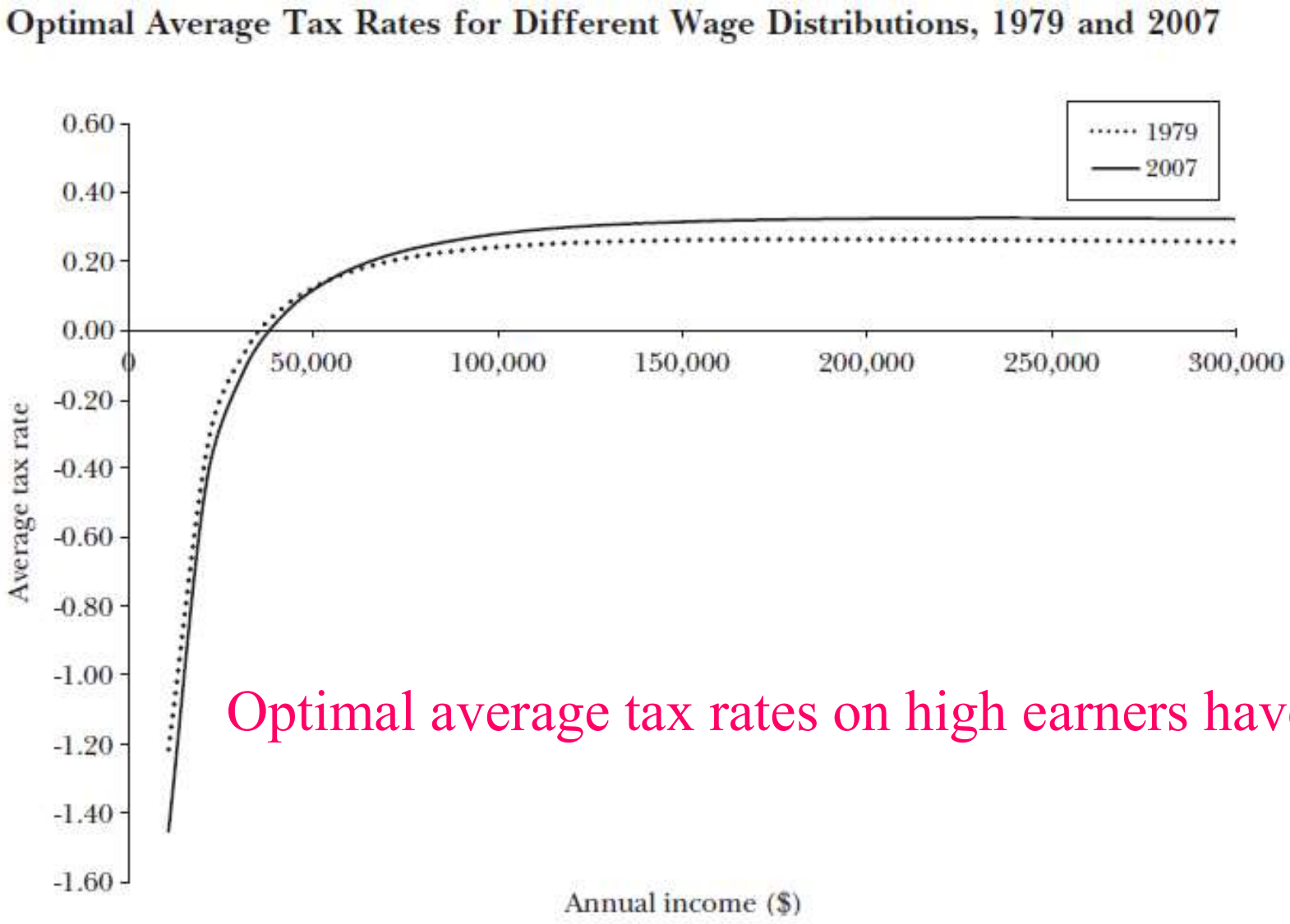


OECD: top MTR ↓ by 11pp in the last 25 years

Lesson 3: The Optimal Extent of Redistribution Rises with Wage Inequality

- Rationale:
  - Explained in class during the previous lecture!
  - Basic Mirrlees (1971) result: greater inequality in ability makes the optimal tax policy more redistributive.
  - Mankiw et al (2009) simulate optimal tax policy using the observed changes in the US wage distribution (wage inequality has risen substantially)

Lesson 3: The Optimal Extent of Redistribution Rises with Wage Inequality



Optimal average tax rates on high earners have increased

Lesson 3: The Optimal Extent of Redistribution Rises with Wage Inequality

- In practice:
- Has policy reacted to higher earnings inequality by increasing social expenditures as a share of GDP?

Lesson 3: The Optimal Extent of Redistribution Rises with Wage Inequality

Inequality and Social Expenditure as a Share of GDP

		Average levels across years observed		*Results of regression of (B) on (A)*	
Country	*Years observed*	*(A) Pre-tax Gini coefficient*	*(B) Social expenditures as share of GDP*	*Coefficient estimate*	*Standard error*
Australia	81, 85, 89, 94	0.34	14%	1.89	0.29
Canada	81, 87, 91, 94, 00	0.38	17%	0.54	0.55
Finland	87, 91, 95, 00	0.42	24%	0.76	0.70
Germany	81, 84, 89, 94, 00	0.35	24%	0.41	0.17
Italy	86, 91, 95, 00	0.32	21%	0.23	0.39
Luxembourg	85, 91, 94, 00	0.29	22%	−0.59	0.30
Mexico	84, 89, 94, 00	0.53	4%	0.37	0.14
Poland	92, 95, 99	0.36	20%	2.29	0.70
Sweden	87, 92, 95, 00	0.44	30%	0.54	0.58
United Kingdom	86, 91, 95, 99	0.37	19%	−0.01	0.53
United States	79, 86, 91, 94, 00	0.41	14%	0.50	0.27
Results of pooled regression (all years and countries) with country fixed effects, clustered standard errors				0.44	0.11

Notes: Gini coefficients from the Luxembourg Income Study; social expenditure data from the OECD.

Lesson 3: The Optimal Extent of Redistribution Rises with Wage Inequality

- In practice:
- As theory suggests, greater inequality is associated with more redistribution.

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

- Rationale:
  - Mirrlees (1971) identified the heart of the problem of tax design to be the tax authority's lack of information about individuals' abilities.
  - He assumed that the tax authority would use income as the only indicator of ability, but he recognized that many more indicators could be used: "One might obtain information about a man's income-earning potential from his apparent I.Q., the number of his degrees, etc"

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

- Rationale:
  - Akerlof (1978) showed that those other indicators were potentially important, both theoretically and empirically. He coined the term "tagging" to describe the use of taxes that are contingent on personal characteristics, and he formally demonstrated that the use of tagging might improve on an income-based tax system.
  - In fact, tagging plays a large role in public spending programs, for the elderly, the disabled, children, and other groups.

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

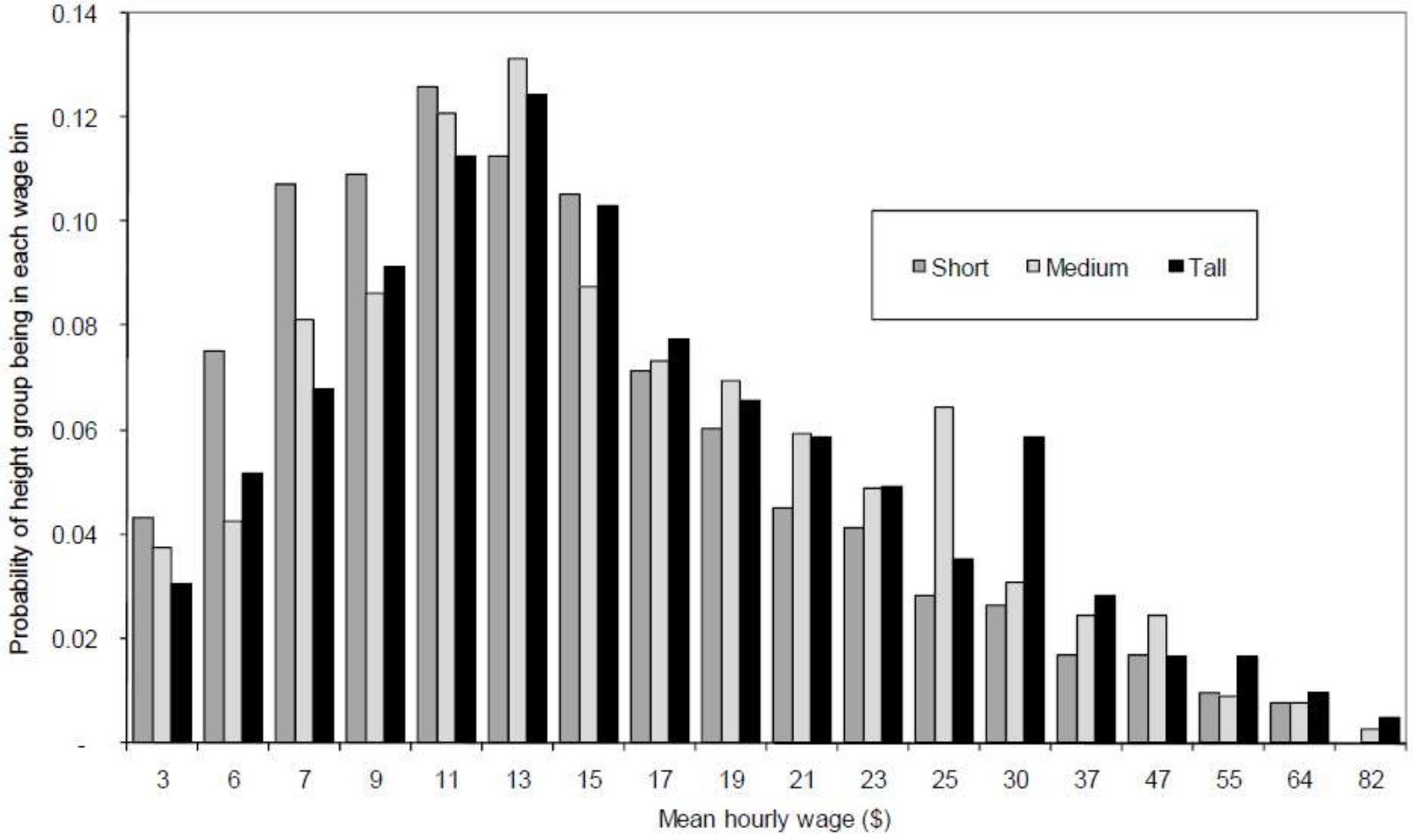
- Rationale:
  - If tags are exogenous (i.e. cannot be influenced by the individual) and are well related to ability, they can be a good signal.
  - Recently, Alesina, Ichino, and Karabarbounis (2008) consider taxes that depend on gender, where the value of tagging comes largely from the differences in labor supply elasticities across genders

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

- Rationale:
  - Mankiw and Weinzierl (2010) consider height-dependent taxes.Here tagging comes from differences in the levels of ability (as proxied by wages) across height.

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

Figure 1: Wage distribution of adult white males in the U.S. by height



Source: National Longitudinal Survey of Youth and authors' calculations

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

Table 5: Example Tax Table

If your taxable income is closest to...	And you are --		
	Short	*Medium*	*Tall*
	69 inches or less	70-72 inches	73 inches or more
	Your tax is --		
5,000	-22,697	-20,546	-20,137
10,000	-19,136	-16,741	-16,391
15,000	-16,107	-13,488	-13,062
20,000	-13,248	-10,413	-9,962
25,000	-10,581	-7,563	-7,061
30,000	-7,992	-4,882	-4,319
35,000	-5,549	-2,274	-1,671
40,000	-3,201	327	860
45,000	-882	2,920	3,420
50,000	1,411	5,444	5,976
55,000	3,599	7,746	8,368
60,000	5,810	10,044	10,788
65,000	8,867	12,350	13,766
70,000	11,931	14,828	16,744
75,000	15,264	18,151	19,722
80,000	18,622	21,506	22,715
85,000	21,979	24,861	25,819
90,000	25,211	28,216	28,922
95,000	28,123	31,349	32,028
100,000	31,035	34,134	35,154

If your taxable income is closest to...	And you are --		
	Short	*Medium*	*Tall*
	69 inches or less	70-72 inches	73 inches or more
	Your tax is --		
105,000	33,947	36,919	38,280
110,000	36,859	39,704	41,406
115,000	39,771	42,488	44,532
120,000	42,682	45,273	47,658
125,000	45,594	48,058	50,784
130,000	48,506	50,843	53,559
135,000	51,289	53,628	55,930
140,000	53,290	56,244	58,300
145,000	55,291	58,344	60,671
150,000	57,292	60,444	63,041
155,000	59,204	62,481	65,412
160,000	60,694	64,500	67,615
165,000	62,184	66,519	69,658
170,000	63,674	68,538	71,701
175,000	65,163	70,556	73,743
180,000	66,653	72,575	75,778
185,000	68,143	74,594	77,722
190,000	n/a	76,613	79,665
195,000	n/a	78,632	81,609
200,000	n/a	80,651	83,552

Note: Taxes calculated by interpolating between the 18 optimal tax levels calculated for each height group.

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

- In practice:
  - Tagging is widely used in public spending, but not taxes
  - Tagging is used in some countries for tax purposes too only with regard to AGE:
    - Several countries including Singapore, Australia, and the United States reduce the tax burden on individuals over 55 and 65 years of age
  - However, the theory tells us, that tax schedules should vary systematically with gender, height, skin color, physical attractiveness, health, parents' education, and so on. No modern tax system has such variation.

Lesson 4: Taxes Should Depend on Personal Characteristics as Well as Income

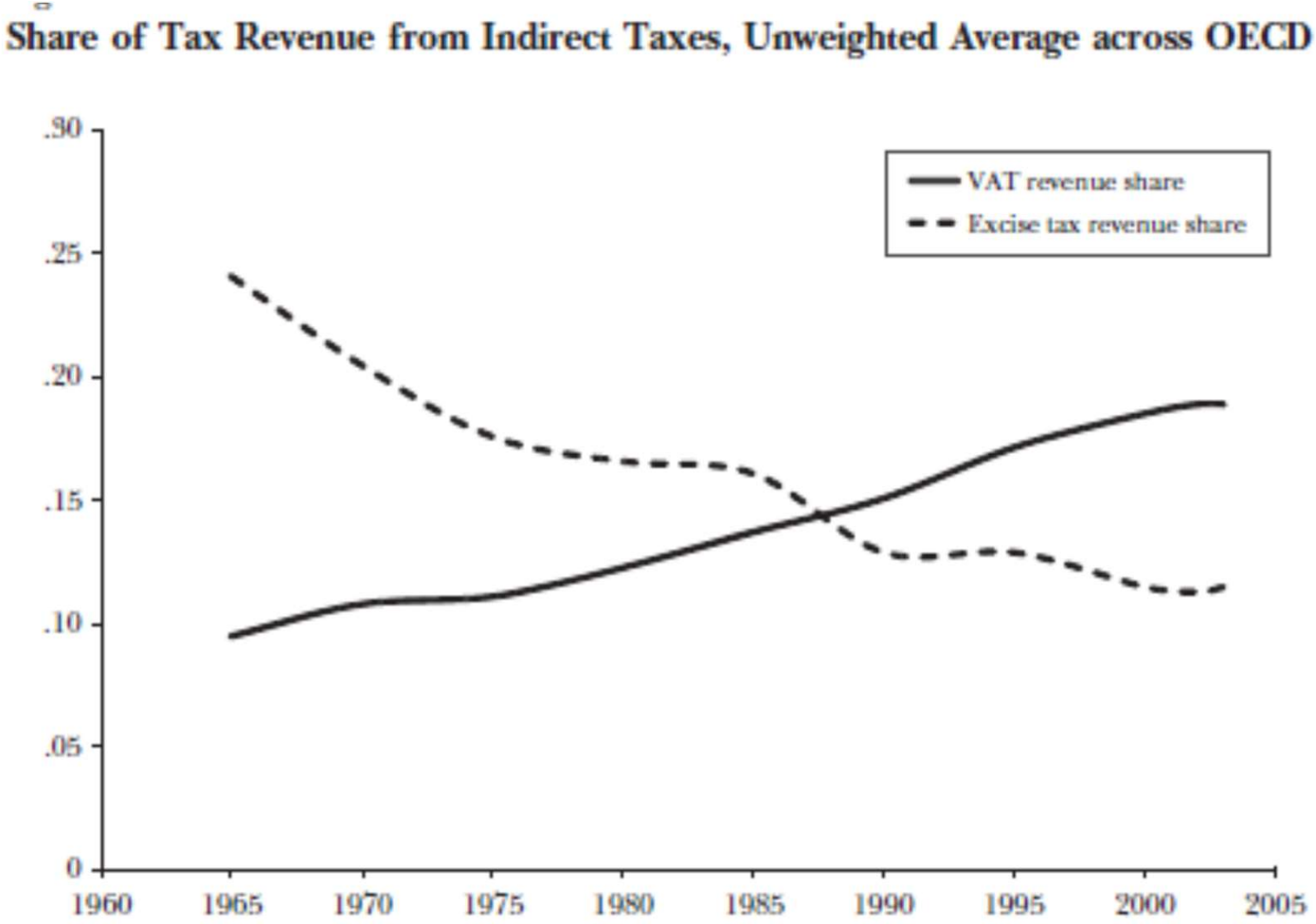
- Rationale:
  - Why are some kinds of tagging prominent, while other possible tags are not used?
  - Optimal tax theory treats all differences between personal characteristics alike and asks only how such differences are correlated with labor supply elasticities and ability.
  - Societies appear to be more comfortable, however, using characteristics that arise over the course of the life cycle and may directly signal economic disadvantage, such as parenthood, disability, and old age—in general, characteristics that anyone might potentially experience at some point in their lifetime.
  - Conversely, society seems less comfortable using characteristics for tagging that are largely predetermined at birth and whose relationship with ability or preferences is more subtle, such as gender, skin color, height, and parents' education.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Rationale:
  - Whatever the optimal allocation of final goods, a social planner would ensure that production of those goods was done as efficiently as possible.
  - Therefore, optimal taxes are zero on all intermediate goods (Diamond and Mirrlees, 1971)
  - Taxes on intermediate inputs to production are not desirable because they distort the allocation of factor inputs.
  - Immediate policy advice: use VAT!

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Practice: lesson well taken
  - More than 130 countries use VAT



Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Design of taxes on final goods:
  - Atkinson and Stiglitz (1976) showed that if
    - the utility function is weakly separable in leisure and all consumption, and
    - preferences for goods do not depend on ability,
    - a fully nonlinear income tax is available

    then optimal taxation of final goods is uniform.
  - This result emerges because there is no information about unobserved ability in an individual's consumption choice that is not also revealed by the individual's income, and so the income tax can be matched to ability as desired.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Departures from uniformity allowed in three cases:
  - CASE 1: when taxing or subsidizing commodities is useful because it raises labour supply.
  - Intuitively, the government then alleviates the distortions of the income tax on labor supply.
  - Tax more goods that are relatively more complementary to leisure: e.g. alcohol, travel, and tourism.
  - Tax less goods that are relatively more complementary to work: e.g. work-related cost of travel, child-care facilities, or education.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Practice:
  - Surprisingly little empirical evidence estimating the degree of complementarity of various commodities with work effort.
  - Exceptions:
    - Crawford et al. (2010) find that for the UK food, energy, tobacco and public transport are complementary to leisure, whereas restaurant dinners, alcohol (!), and fuels are complementary to work.
    - Pirttila and Suoniemi (2010) show that in Finland capital income and expenditures on housing are complementary to leisure, whereas child-care facilities are complementary to labor.

More empirical work needed on this.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Departures from uniformity allowed in three cases:
  - CASE 2: when taxing or subsidizing commodities is useful as a redistributive device.
  - Justified if:
    (i) The government uses an informationally inefficient income tax for income redistribution, and
    (ii) Individuals differ not only in their ability, but also in their preferences for certain goods.
  - Intuition: when the preference to consume certain commodities correlates with earnings ability, conditional on observing earnings, commodity demands provide useful additional information on who has a high or a low ability and, therefore, should be used for redistribution

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Practice:
  - In many countries, many goods are exempted from value-added taxes or are taxed at a zero rate: e.g. education, agriculture, real estate, public services, arts, medicines, books, child care.
  - Governments claim they do this for distributional reasons, but these exemptions do not have a clear welfare economic rationale.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Practice:
- Although there are no clear welfare-economic motives why goods such as health care and housing are subsidized, there might well be non-welfarist reasons for doing so.
- Remember from Lecture 3 Sen's capability approach: maximizing social welfare is not seen as the proper objective for the government. The government should instead be concerned with (the distribution of) capabilities.
- Subsidizing health care and housing enhance basic capabilities and can be defended on that ground.
- Similarly, from behavioral economics we know that individuals may be subject to all kinds of self-control issues. Thus, it may be desirable to provide subsidies in kind rather than cash transfers

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Departures from uniformity allowed in three cases:
  - CASE 3: when taxing or subsidizing commodities is useful to correct externalities (recall Pigou).
  - Environmental taxes should be introduced for environmental reasons
  - The optimal Pigouvian tax exactly internalizes the external damage of polluting consumption in market prices.
  - The main determinant of environmental taxes should be the marginal external damage.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Example of CO2-emissions:
  - Social cost of carbon: ranging from 24-35$ per tonne CO_2-emissions (Tol, 2008) up to $85 per tonne CO_2-emissions (Stern, 2007).
  - These estimates can in principle be used to calculate the implied Pigouvian taxes on energy and fuels and compare those to the current level of excises.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Example of CO_2-emissions, Netherlands:
  - Excises on household energy use:
    GAS: 89 euro/tonne CO_2
    ELECTRICITY: 192 euro/tonne CO_2
  - Excises on small enterprises and services energy use:
    GAS: 78 euro/tonne CO_2
    ELECTRICITY: 70 euro/tonne CO_2
  - Excises on fuels:
    DIESEL: 130 euro/tonne CO_2
    'RED' DIESEL (for agriculture): 80 euro/tonne CO_2
    PETROL: 250 euro/tonne CO_2!!!
    BIODIESEL: 160 euro/tonne CO_2

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Example of CO_2-emissions, :
  - The social cost of carbon is not constant, but will rise over time as the rising stock of CO_2 in the atmosphere gradually warms up the earth and creates more environmental damage over time
  - Thus, optimal energy taxes will display a rising pattern over time!

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Example of CO_2-emissions :
  - The environment is a global public good.
  - Given the absence of a global government, there will be huge coordination failures in securing the efficient level of CO_2 emissions.
  - Countries try to free ride on each other's efforts to reduce global warming.
  - CO_2-emissions will be reduced only if all countries in the world commit themselves to binding agreements on carbon taxes or tradable emission permits.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Example of CO_2-emissions :
  - As long as individual or groups of countries unilaterally try to reduce energy demand, only the world price of energy falls so as to restore equilibrium on world-energy markets.
  - A country on its own if really wants to directly contribute to reductions of CO_2-emissions, it should not try reducing demand for energy through energy taxes, but rather leave their own fossil fuels in situ.
  - This will diminish public revenue from gas or oil sales (or from the taxes and excises levied on resources), but directly reduces supply of carbon to world-energy markets.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Some special cases:
  - Good reasons to levy excises on meat, poultry fish and other products from factory farming markets.
  - Why? Massive uses of antibiotics, pesticides, growth hormones, fertilizers, and so on, pollute the environment, threaten public health, and harm animal well being.
  - Moreover, factory farms are sources of bacterial and viral diseases among living stock and human beings, as break outs of various diseases in recent decades have demonstrated.

Lesson 5: Only Final Goods Ought to be Taxed, and Typically They Ought to be Taxed Uniformly

- Some special cases:
  - Levy excises on commodities connected with unhealthy life styles.
  - Gruber (2010) views obesity as the largest threat for public health in the US.
  - So, levy excises on fast food, sugar, and saturated fats.
  - Similar arguments for high excises on tobacco and alcohol.
  - Ideally, optimal tax on alcohol should be non-linear (increasing with alcohol consumption): too difficult in practice.

Example: S. Kohne "Optimal taxation in practice: Lessons for the Swedish Tax System" February 2017

(http://www.riksrevisionen.se/PageFiles/25716/Optimal%20taxation%20in%20practice.pdf)

This report surveys the main academic findings about the optimal design of taxes. The general policy lessons are as follows.

Lesson 1: Given current empirical knowledge, optimal tax rates on labour incomes cannot be predicted with high precision.

Lesson 2: Except for health-promoting benefits (e.g., friskvårdsbidrag), there is no evidence against treating all types of labour incomes (wages, bonuses, other pecuniary benefits) symmetrically for tax purposes.

Lesson 3: There is no scientific consensus on the main determinants of capital income taxes, nor on the optimal magnitude of capital income taxation.

Lesson 4: There is no evidence against treating all types of capital incomes symmetrically for tax purposes. In particular, property taxes on real estate should match the tax burden on imputed rents if those rents were classified as capital incomes.

Example: S. Kohne "Optimal taxation in practice: Lessons for the Swedish Tax System" February 2017

(http://www.riksrevisionen.se/PageFiles/25716/Optimal%20taxation%20in%20practice.pdf)

Lesson 5: Corporate income taxes should be low. Policy makers should pay attention to global trends in corporate taxation.

Lesson 6: A uniform VAT is advisable. Any remaining exceptions should be abolished and income taxes and transfers adjusted to compensate households for the higher tax burden.

Lesson 7: To correct for negative social effects, there should be taxes on environmentally harmful activities, alcohol and tobacco. (Possibly also on unhealthy foods and drinks.) Policy makers should seek up-to-date estimations of the external costs when setting the rates for these taxes.

Lesson 8: Household-related services, job-related expenses (travel, commuting, clothing, equipment, etc.) and human capital investments should be favoured by the tax system. In particular, RUT and ROT reductions are generally advisable.

Behavioural economics and tax policy

- Behavioural economics: combination of psychology and economics that investigates what happens in markets in which some agents display human limitations and complications
- Implications of behavioural economics for tax policy is a new and growing trend
- Behavioural Insights Team in UK is an organization that "was set up to apply behavioural economics and psychology to try to improve government policy"

Example: bounded rationality and tax policy

- Bounded rationality: individuals do not consider all information when making complex choices, as it can be costly for them to do so.
- Schmeduling: workers do not accurately perceive their tax schedule
- Ironing: a form of schmeduling where workers facing a multi-rate schedule use their average tax rate as the basis for decision-making rather than their marginal tax rate.

Example: bounded rationality and tax policy

- Researchers argue that ironing is more likely when:
  - There are many marginal tax rates
  - The tax code gets revised frequently
  - The taxpayer faces more than one schedule simultaneously (e.g income tax, SSC, etc)
  - Less likely at higher incomes (where people employ tax consultants)

Alternative presentations of equivalent information

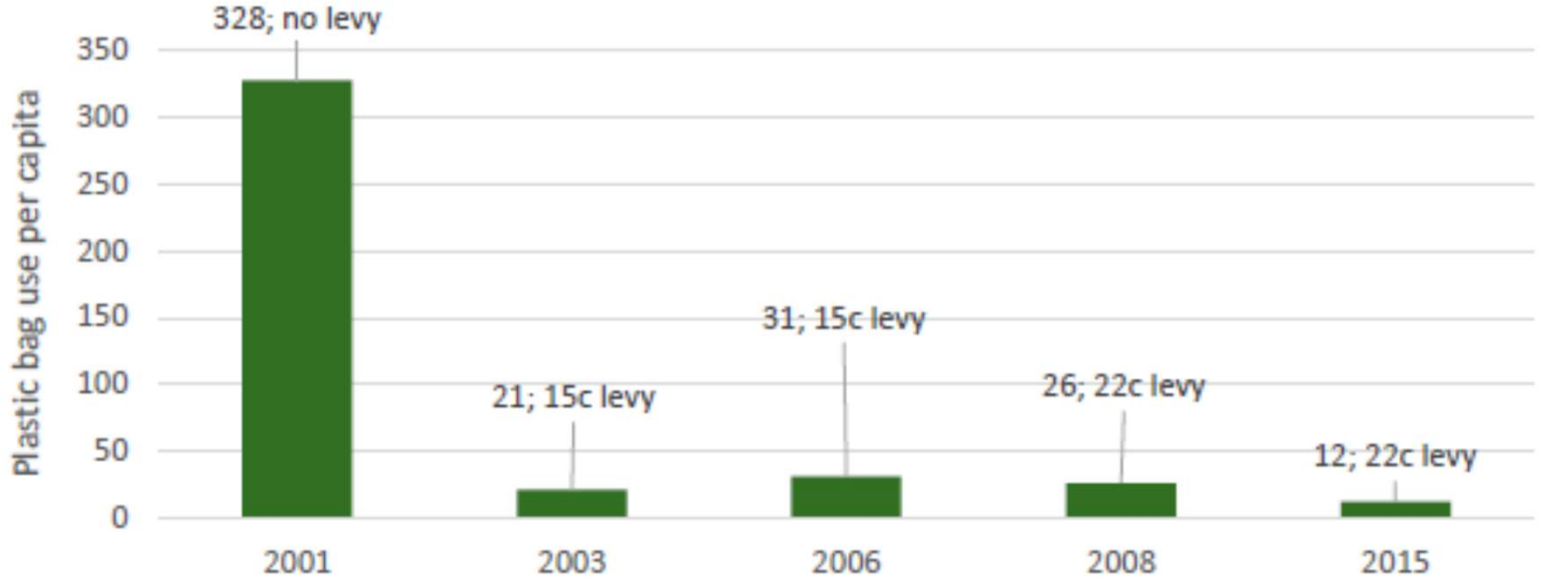
(data refers to Ireland)

	Salary 1	Salary 2
Gross Salary	€25,000	€100,000
Net Salary	€21,760	€60,871
Absolute Tax Amount	€3,240	€39,129
Average Tax Rate	13%	39.1%
Gross Salary Multiple	1	4
Net Salary Multiple	1	2.8
Tax Multiple	1	12.1

Note: the data in both columns refer to a single individual, private sector PAYE employee, paying the full rate of PRSI in 2017.

Plastic bag levy and usage in Ireland

Figure 4: plastic bag usage over time



Source: Department of Housing, Planning, Community and Local Government

Optimal Taxation with Behavioral Agents (Farhi and Gabaix, AER, 2020)
Examples of how optimal taxation rules change when we introduce behavioral biases

- The Ramsey inverse elasticity rule states that optimal taxes to raise revenues are inversely proportional to the elasticity of demand. We show that when agents have limited attention to the tax, the Ramsey inverse elasticity rule is modified: optimal taxes increase and scale with the inverse of the square of the attention.
- A fundamental result of the Mirrlees nonlinear income tax model is that optimal marginal tax rates are weakly positive. We show that if the poor do not fully recognize the future benefits of work, perhaps because of myopia or hyperbolic discounting, then it is optimal to introduce negative marginal tax rates for low incomes. In addition, if the top marginal tax rate is particularly salient and contaminates perceptions of other marginal tax rates, then it should be lower than prescribed in the traditional analysis.

Conclusions

- Some trends in tax policy look like at least partial victories of optimal tax theory
- Some other results of optimal tax theory cannot be easily identified in actual policy
- Why? Theory is right, but policy makers are slow to appreciate it?
- Or, optimal tax theory ignores certain aspects?
- This is an open question for research

Main references

- *Hindriks, J and G.D. Myles *Intermediate Public Economics.* (Cambridge: MIT Press, 2005) Chapter 15.8.
- *Heady, C. (1993), "Optimal Taxation as a Guide to Tax Policy", *Fiscal Studies*, Vol. 14, pp. 15-41.
- *Jacobs, B. (2013), "From Optimal Tax Theory to Applied Tax Policy", CESIFO Working Paper, No. 4151, Munich.
- Salanié, B., (2003), *Economics of Taxation,* Cambridge: MIT Press, Chapter 5.
- *Mankiw, N.G., M. Weinzierl and D.Yagan, (2009), "Optimal Taxation in Theory and Practice", *Journal of Economic Perspectives*, Vol. 32 (4), pp. 147-174.
- *Mankiw, N.G. and M. Weinzierl (2010), "The Optimal Taxation of Height: a Case Study of Utilitarian Income Distribution", *American Economic Journal: Economic Policy*, Vol. 2 (1), pp. 155-176.
- Deaton, A. and Stern, N. (1986), 'Optimally uniform commodity taxes, taste differences and lumpsum grants', *Economics Letters*, vol. 20, pp. 263–6.
- Ebrahimi, A. and Heady, C. J. (1988), 'Tax design and household composition', *Economic Journal*, Conference Papers, vol. 98, no. 390, pp. 83–96.
- Department of Finance (2017) Implications of Behavioural Economics for Tax Policy, Research Paper, July 2017, Ireland.