Conditionality of social transfers and progressivity of a universal basic income

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- Some would **gain**, some would **lose**. Is it a desirable reform?

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  - (mitigated by behavioral responses).
- Consequently,
  - combined effect of unconditionality and higher taxes,
  - the effect of higher taxes is very uncertain.

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- $$c = y - \mathrm{t}(y) + \alpha(\overline{y} - y), \tag{4}$$

  Moene and Ray (2016).

Lemma

All these equations are equivalent. *For any weakly increasing function* $f : \mathbb{R}_+ \to \mathbb{R}_+$ *such that* $c = f(y)$*, there exists numbers* b *and* α *and functions* τ, t, T *and* t *such that*

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In words: UBI is not a two-dimensional issue.

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Currently: social transfer ($-\tau(0)$) (unemployment benefits UB or social assistance SA):

- $UB(y = 0$, preferences=willing to work$) > 0$,
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UBI:

- $-\tau(y = 0$, preferences=unwilling to work, means of partner=high$) = UBI > 0$,

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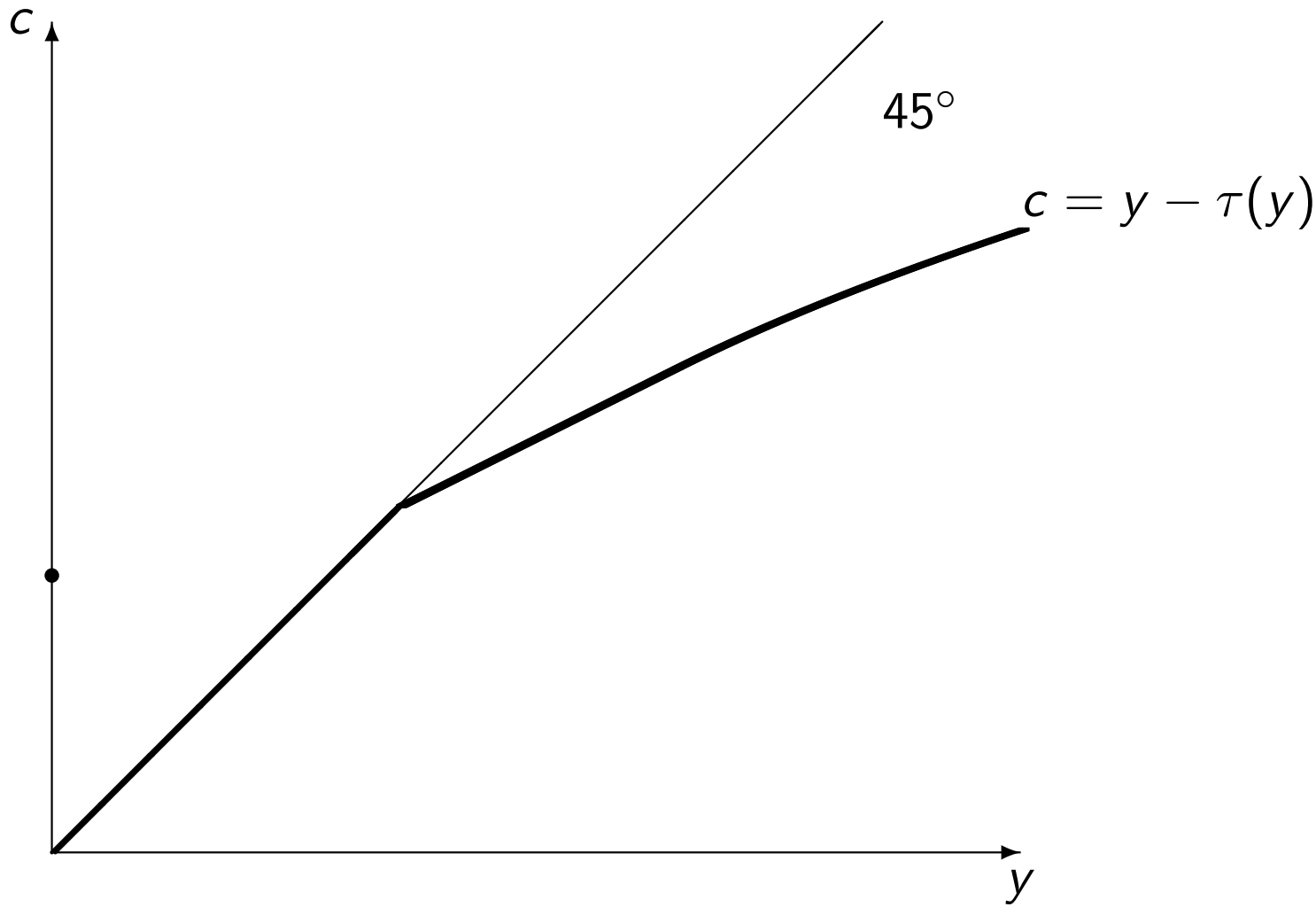

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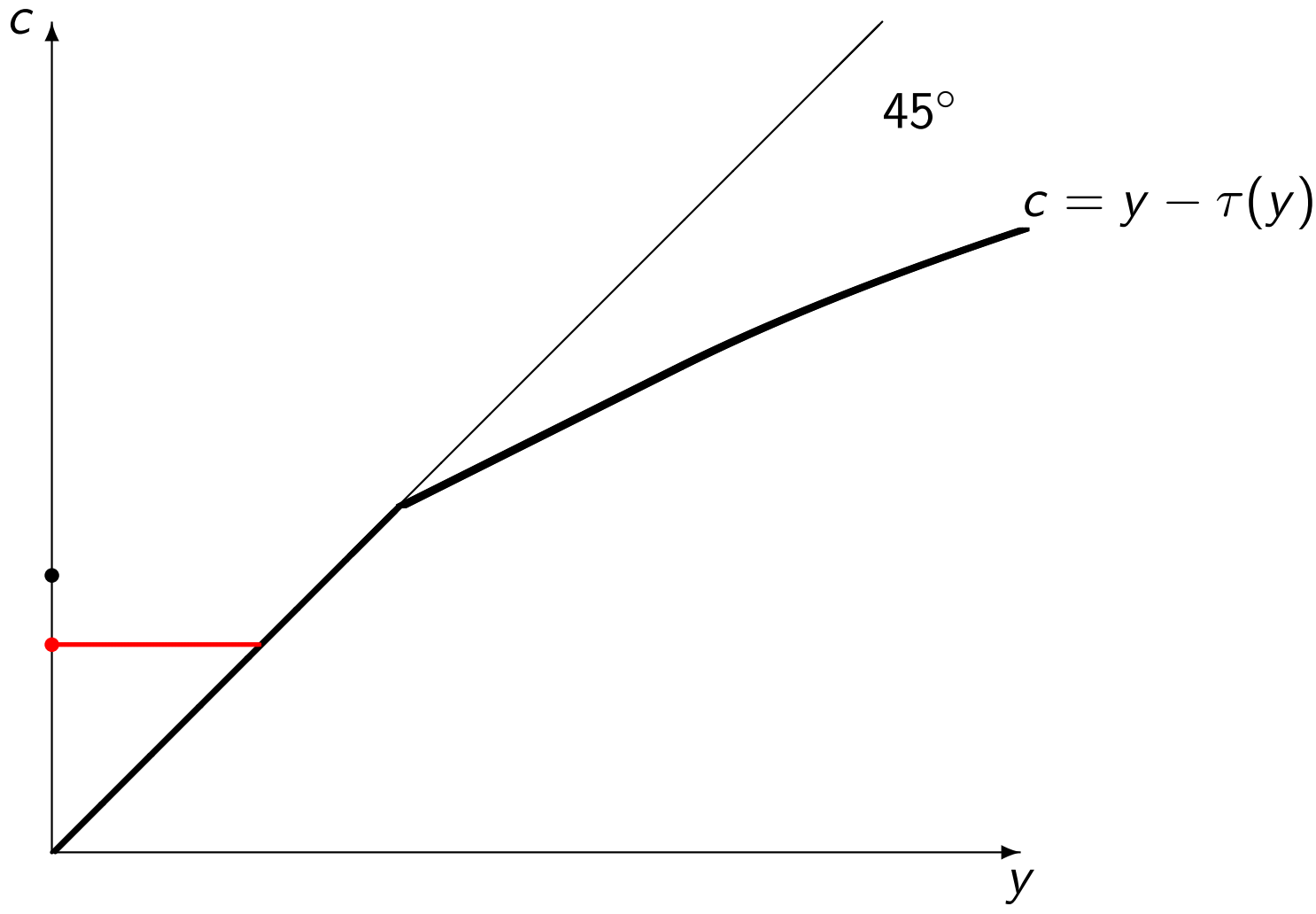

Figure: Modeling the introduction of a UBI

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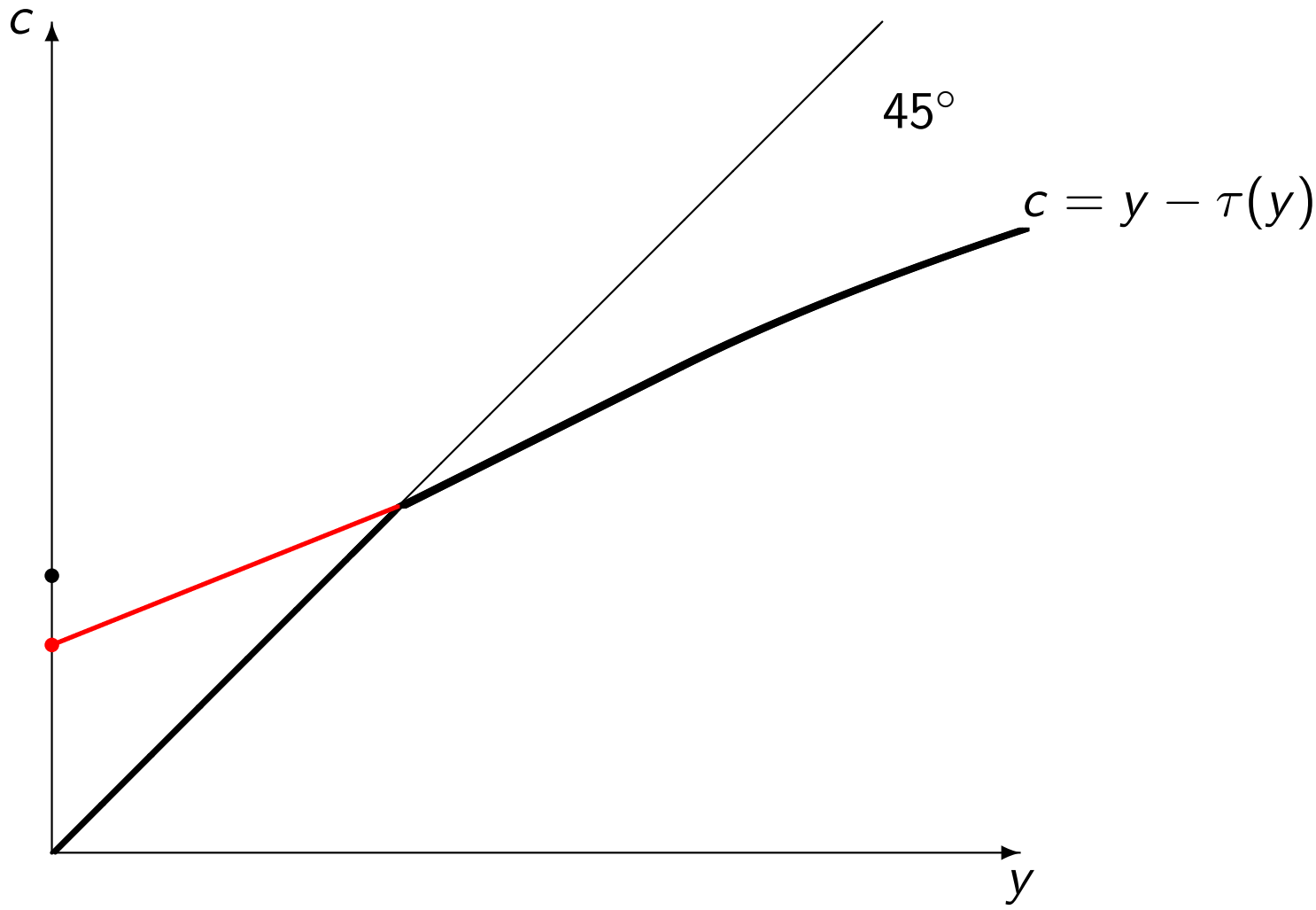

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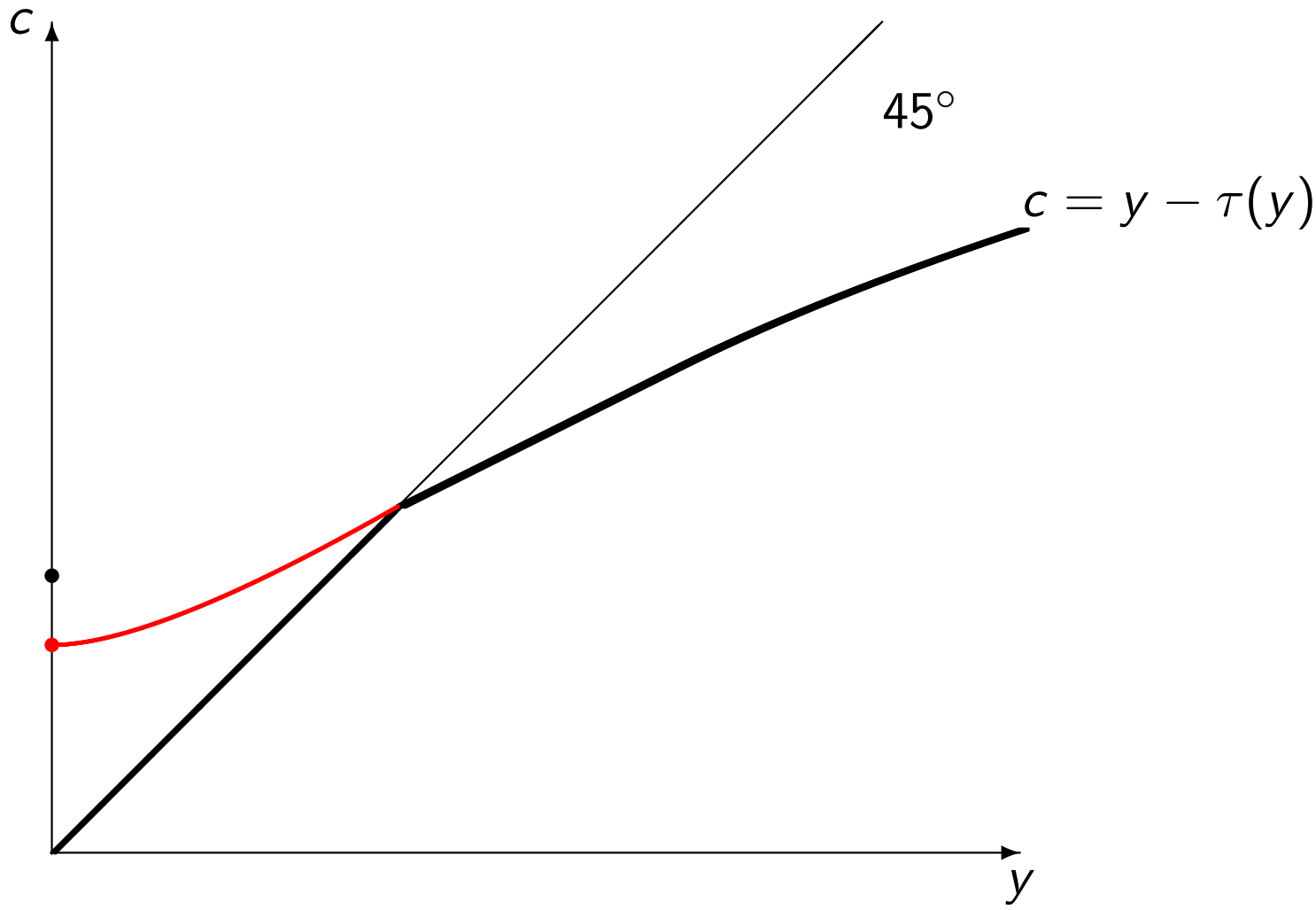

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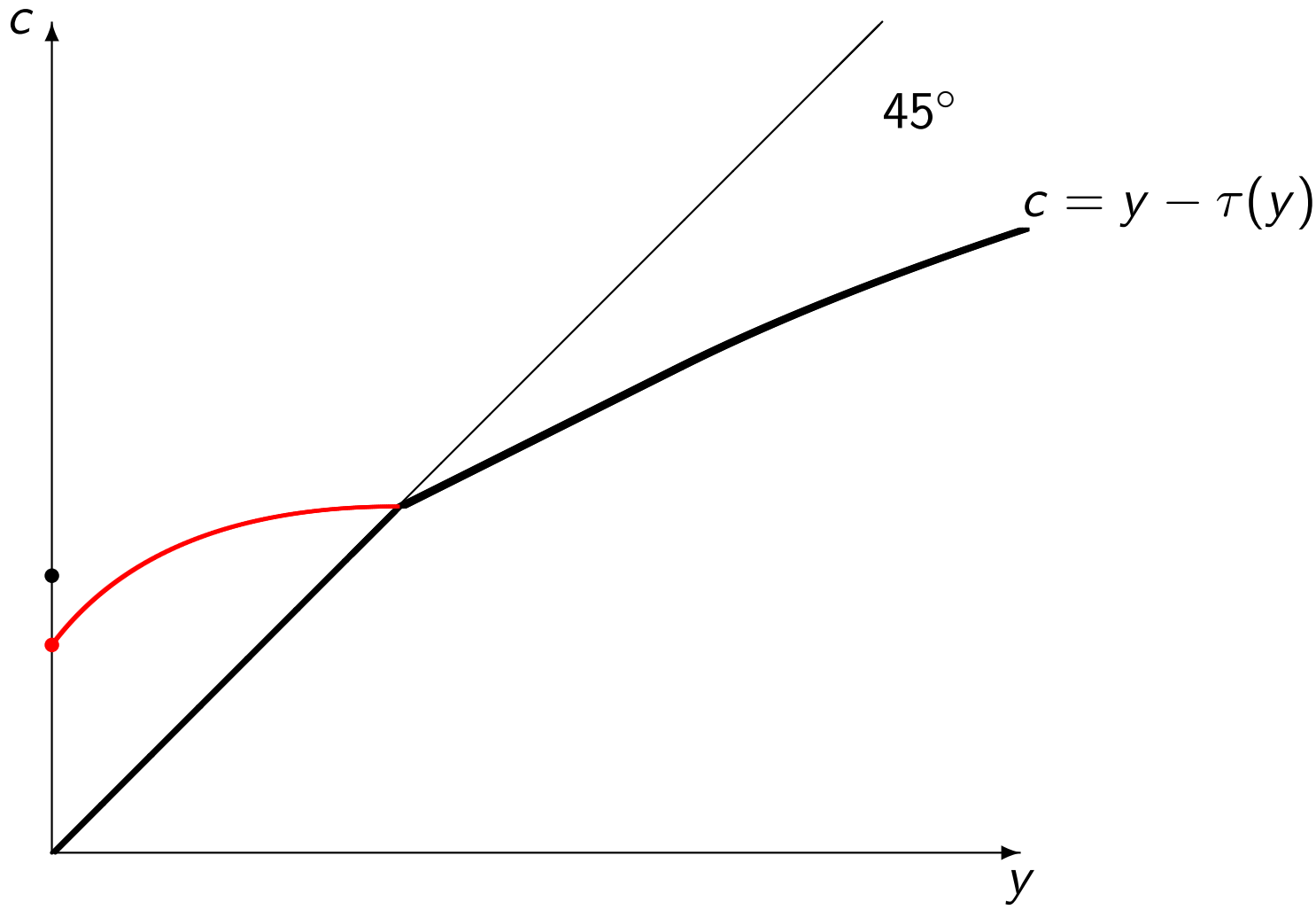

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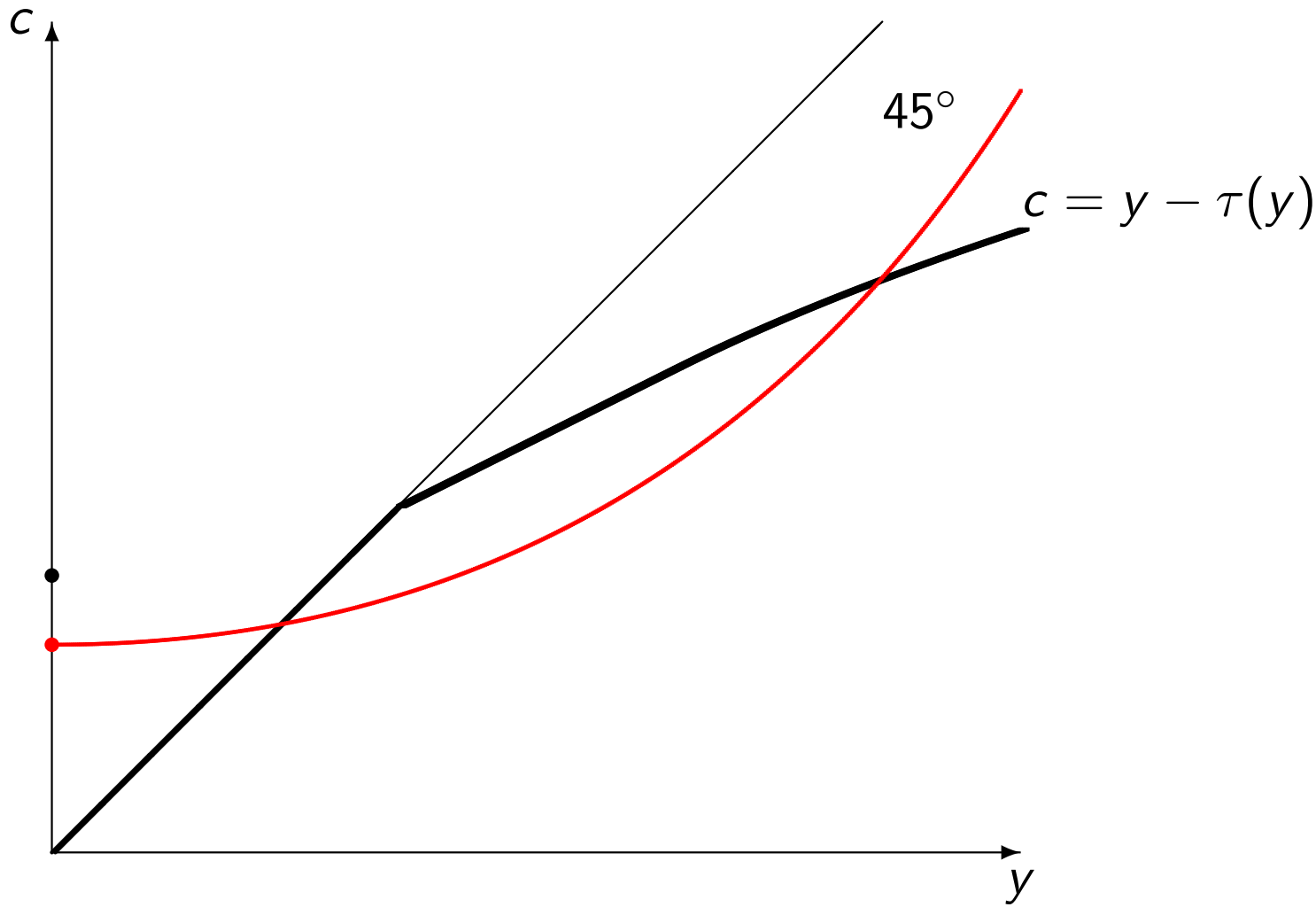

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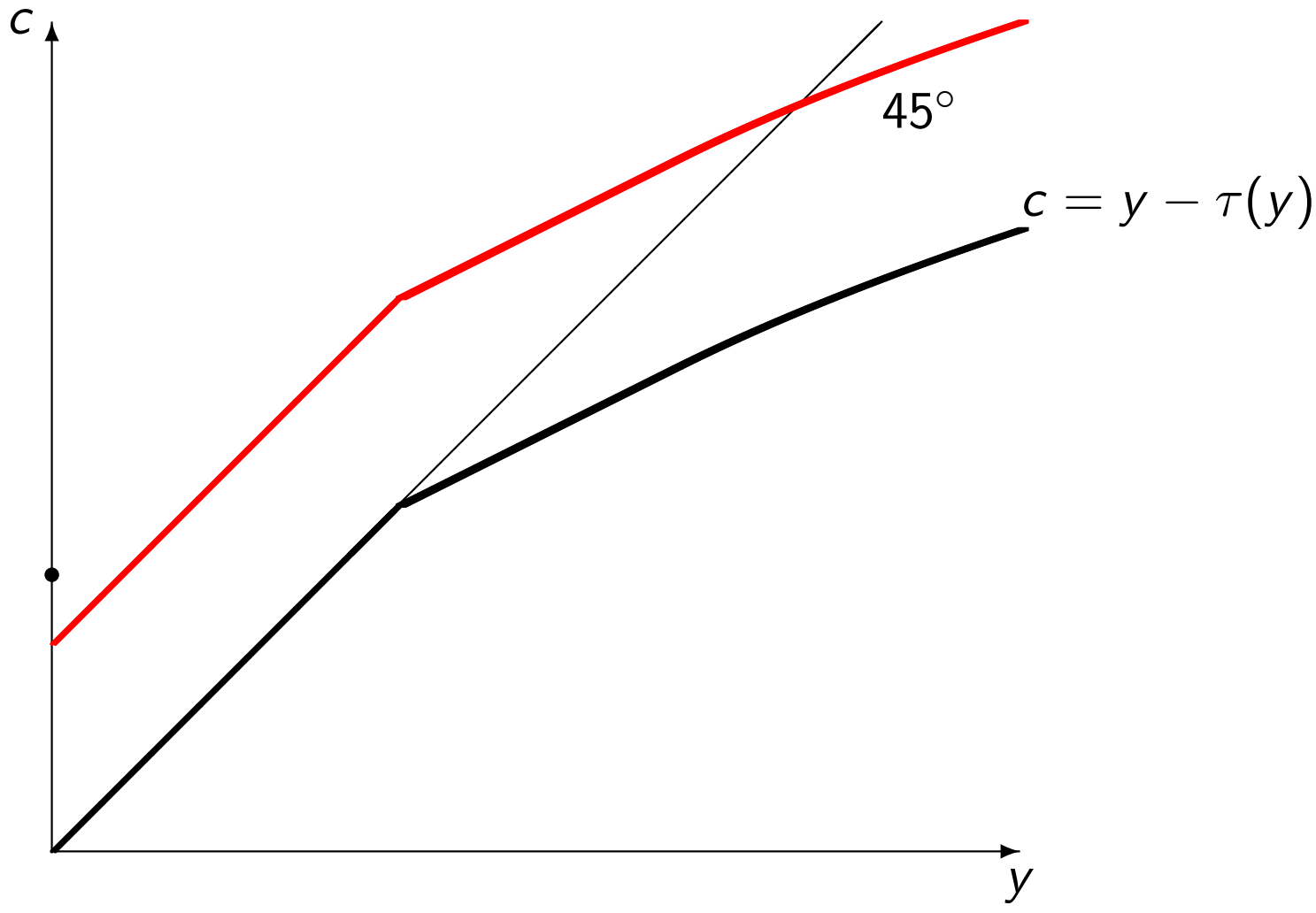

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  - we estimate a model of **labor supply for second-bread** (=women) earners for 2019,
    - random utility DCM (Van Soest, 1995),
    - 4 possible labor times,
    - Box-Cox utility function;

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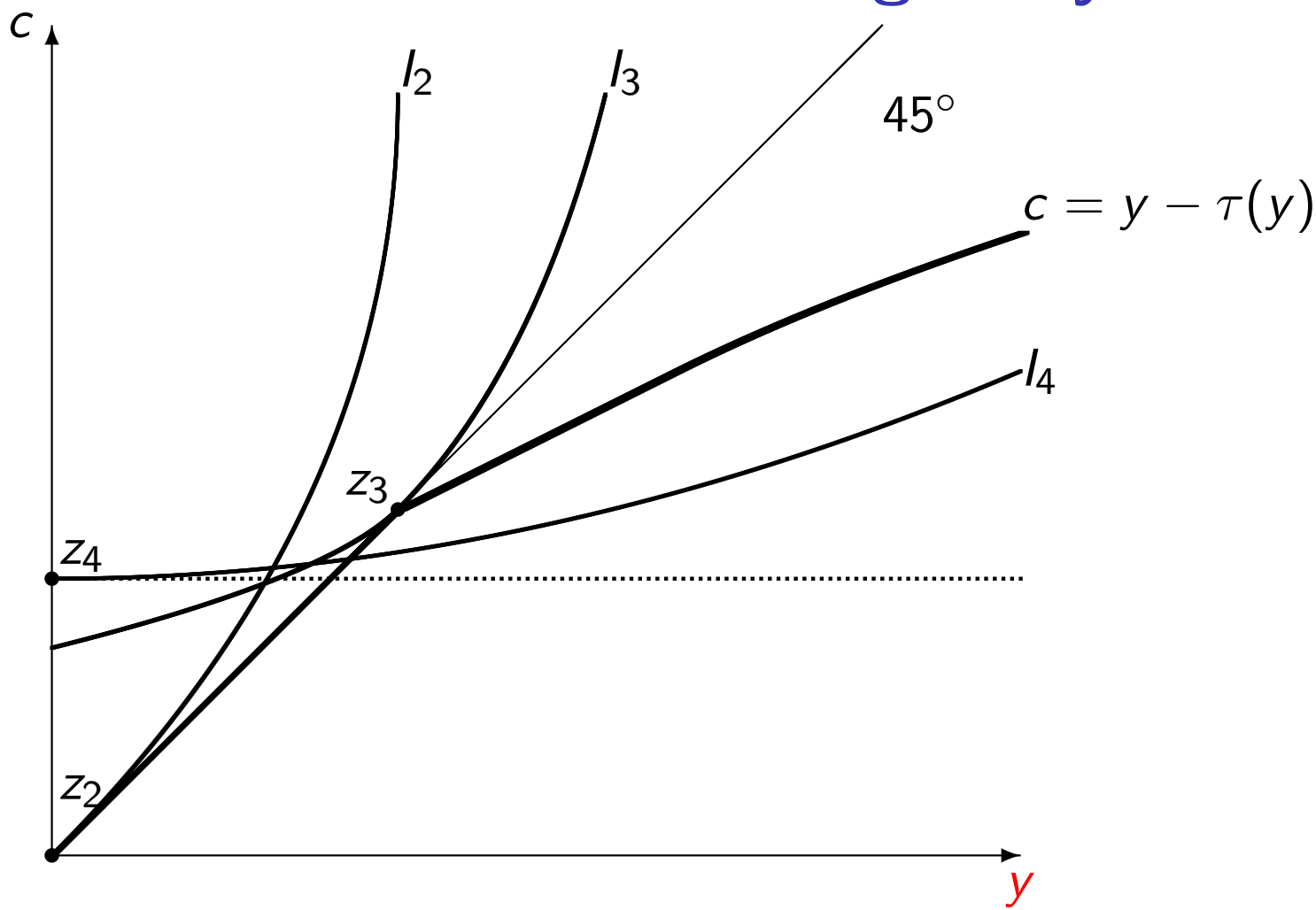
- and we contrast it with: **no condition on** willingness to work, **condition** on means.
- In the near future:
  - more general household model (two bread earners),
  - with random opportunities,
  - for a sample of European countries.

Individual Well-being measures: **Double heterogeneity**



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- a numerical **representation** of the preferences,
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- 1) redistribution should take place **from high- to low-skill** individuals,
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- principles 1) and 2) are in conflict,
- **priority** to one principle, combined with a **limited** application of the other.

Household Well-being measures

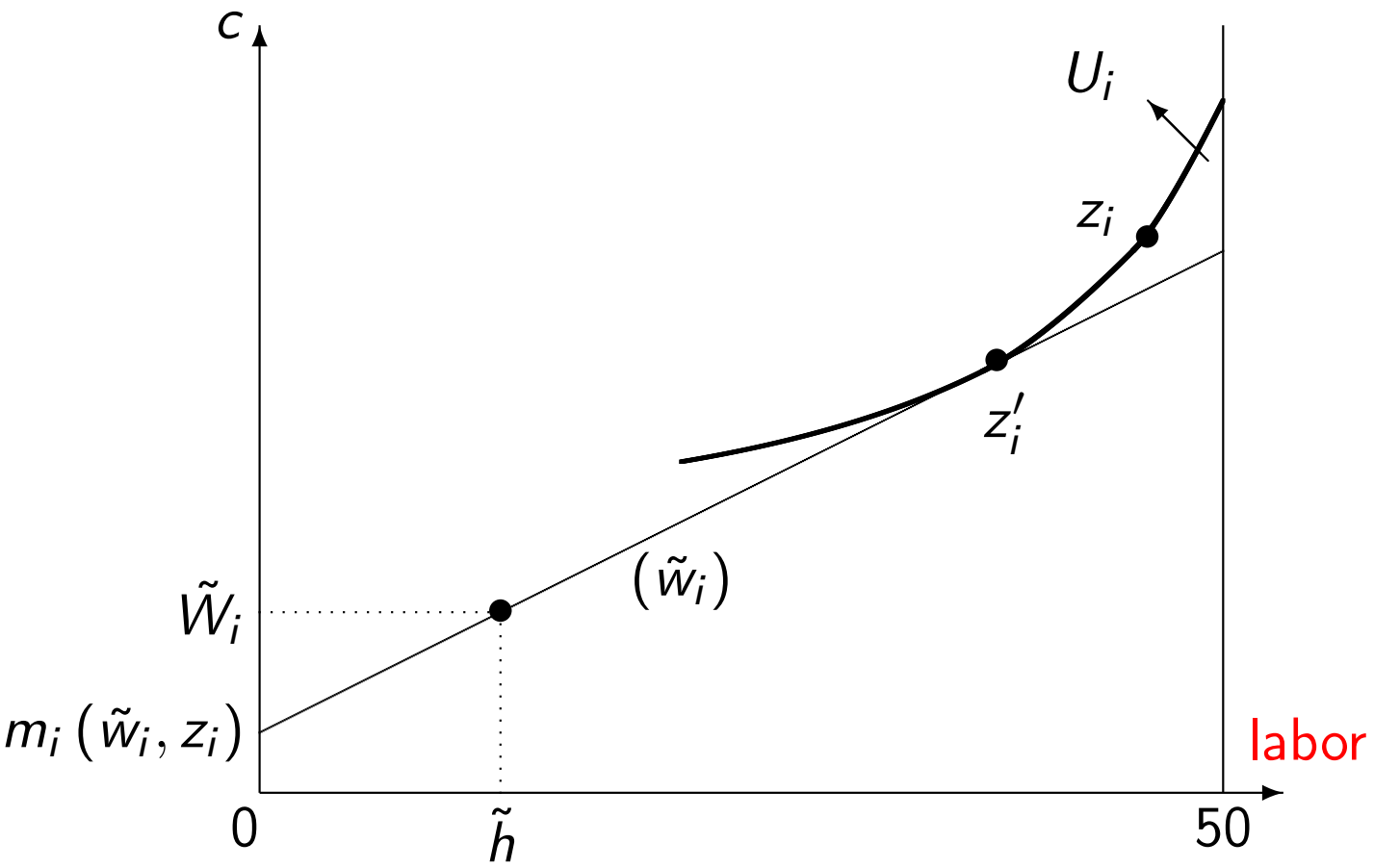

Figure: The construction of well-being indices:

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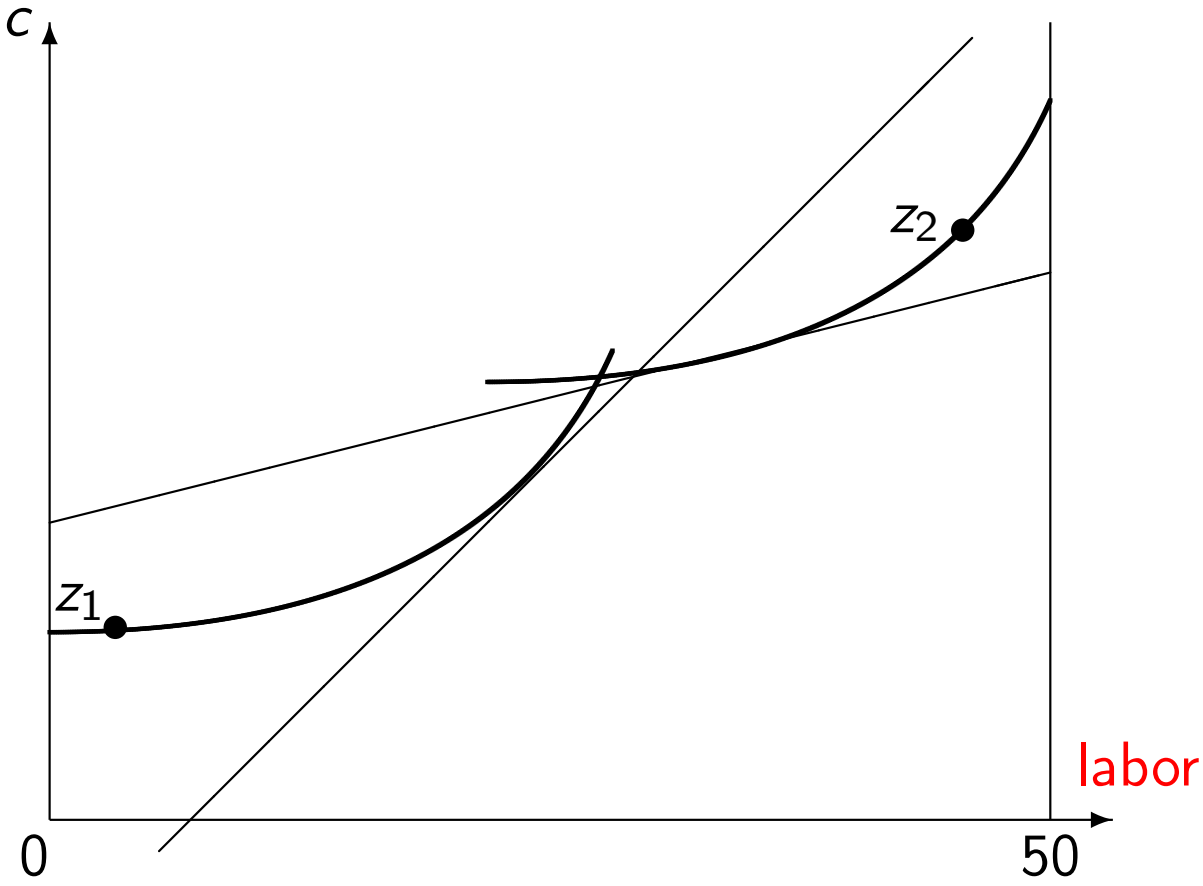

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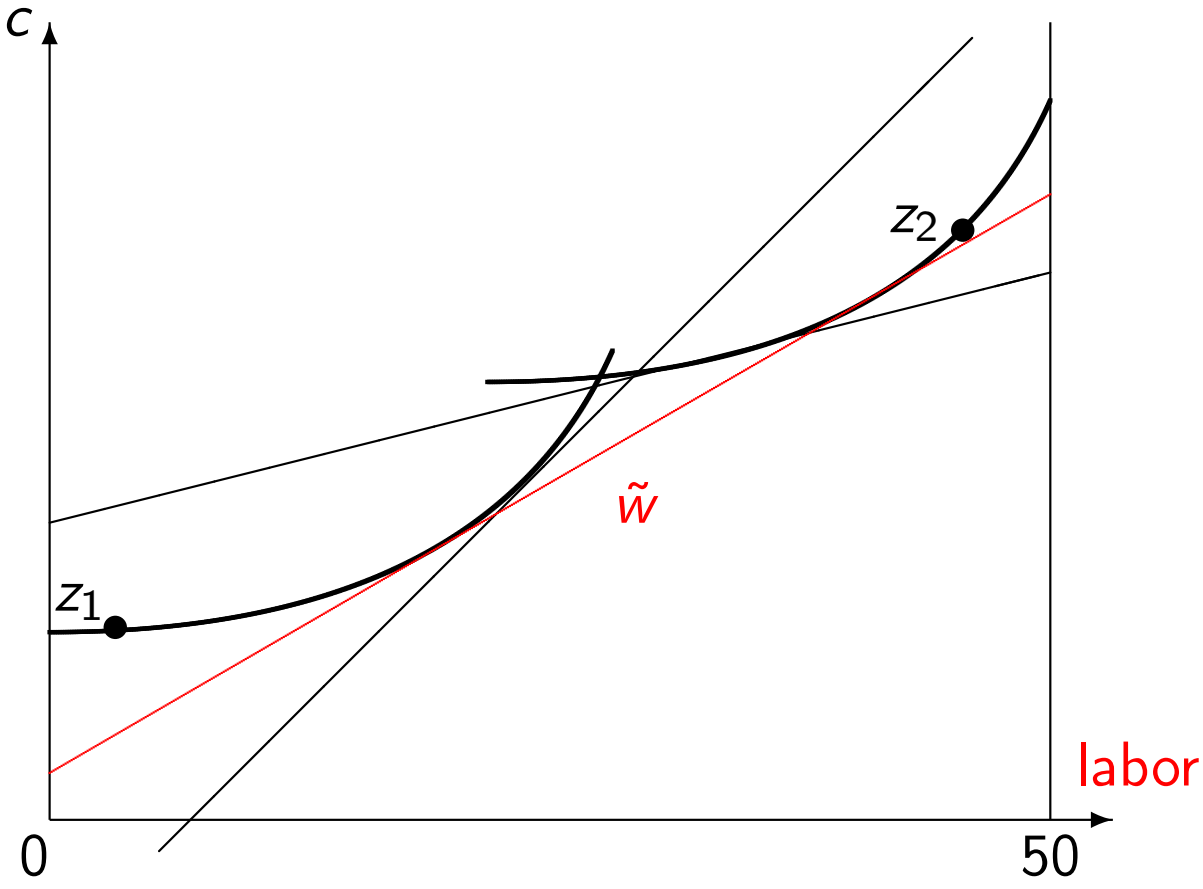

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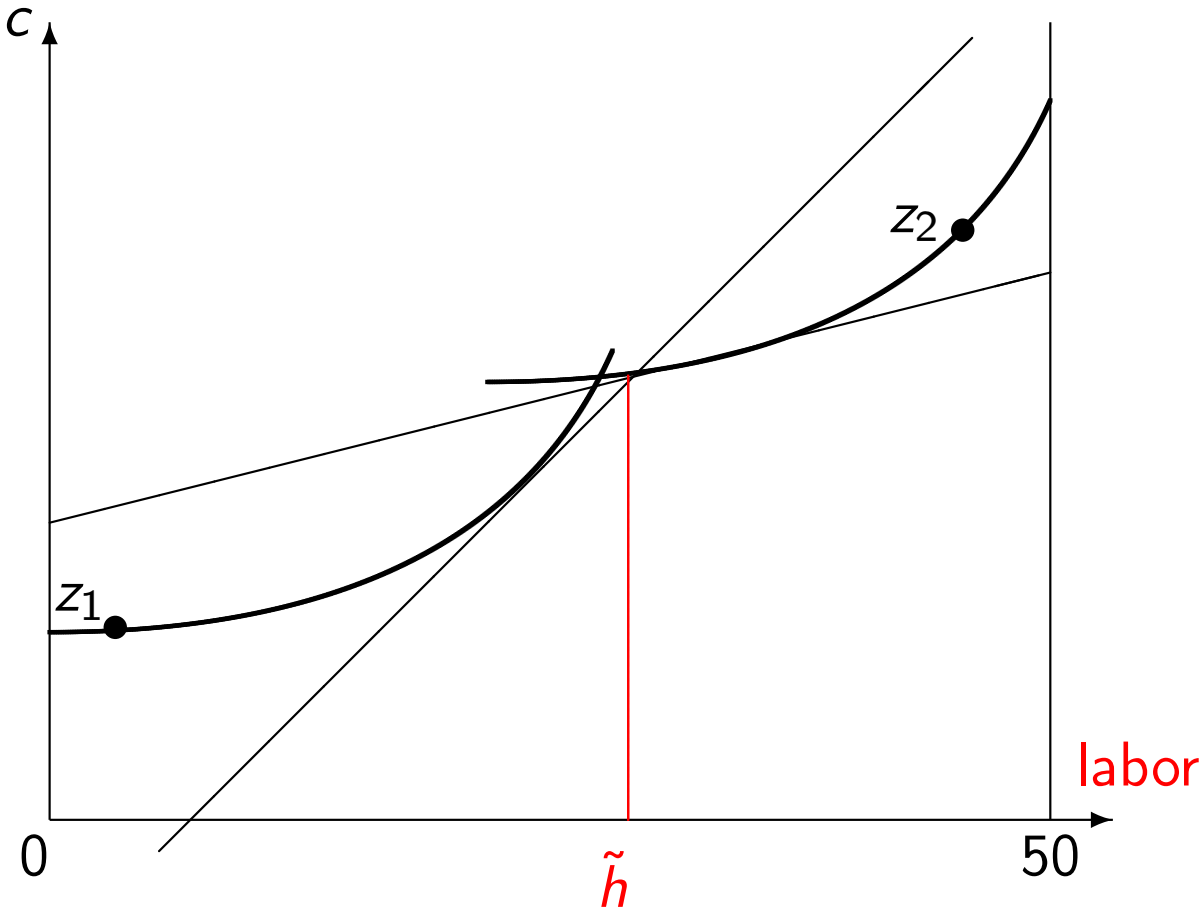

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Data and Descriptive statistics

Table: Summary statistics for women with rich (full time) partner in Belgium (without social assistance and unemployed recipients).

Variable	Mean	Std. dev.	Min	Max
Income	6053.45	1886.42	1892.79	14513.94
Hours	28.075	16.31	0	60
Employed	0.797	0.402	0	1
Wage_rate_employee	26.798	9.799	8.02	73.2
Wage_rate_self_employed	27.336	13.06	6.91	79.49
Part_time_dummy	0.145	0.352	0	1
Full_time_dummy	0.633	0.482	0	1
Extra_time_dummy	0.019	0.138	0	1
Age	43.37	9.672	20	64
Primar_Education	0.0511	0.220	0	1
Lower_Secondary_Education	0.063	0.244	0	1
Higher_Secondary_Education	0.227	0.420	0	1
Tertiary_Education	0.658	0.475	0	1
No_Children	1.399	1.215	0	7
No_Children_0_3	0.109	0.329	0	2
Luxembourg_National	0.809	0.393	0	1

Note: EUSILC 2019 (EUROMOD input data) for women with rich (full time) partner in Belgium where Unemployed and Social Assistance recipients are excluded.

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$$c_{ij} = W_i + w_i(50 - j) - \tau_i(w_i(50 - j)).$$

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3. $\hat{\gamma}_i$ computed according to Revelt and Train (2000).

Estimates

Table: Labour Supply estimation

Variables	Coefficients	SE
Mean		
Income (Box-Cox: 0.813)	10.09***	(0.799)
Leisure (Box-Cox: -0.924)	10.65***	(2.892)
Age X Leisure	-0.412**	(0.140)
AgeSquare X Leisure	0.00550***	(0.00164)
Number of Children X Leisure	0.158	(0.121)
Number of Children Age0-3 X Leisure	0.496	(0.447)
Primar Education X Leisure	7.003***	(1.566)
Higher Secondary X Leisure	0.386	(0.312)
Nationality X Leisure	-0.716*	(0.353)
SD		
Leisure	0.000276	(0.199)
N	4 X 567 = 2268	

Standard errors in parentheses
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Behavioral effect of UBI=50%

Table: Transition Matrix with 1074 UBI

		post_reform_1074 UBI				
		1	2	3	4	Total
pre_reform	1	24,936	0	0	0	24,936
	2	141,323	43,035	0	0	184,358
	3	124,168	0	212,971	0	337,139
	4	0	0	0	4,819	4,819
	Total	290,427	43,035	212,971	4,819	551,252

Note: Universal Basic Income(UBI)=50% (1074 Euro/month) of median of equivalised disposable income.

Progressivity/regressivity of UBI: summary

OLS coeff. between well-being and being a winner.

UBI	$\tilde{w} = 0$	$\tilde{w} = w_{\min}$	$\tilde{w} = \bar{w}$	$\tilde{h} = 0$	$\tilde{h} = 20$	$\tilde{h} = 40$
1074	-4.15***	-3.23***	-1.91***	9.22***	5.78***	.19***

Table: Progressivity/regressivity of UBI

- **progressive only for** $\tilde{w} = 0, \tilde{w} = w_{\min}, \tilde{w} = \bar{w}$,
- only **moderately** progressive,
- **progressive/regressive for** $\tilde{h} = 40$ (very redistributive)?

Means-tested

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UBI	$\tilde{w} = 0$	$\tilde{w} = w_{\min}$	$\tilde{w} = \bar{w}$	$\tilde{h} = 0$	$\tilde{h} = 20$	$\tilde{h} = 40$
1074	-4.15***	-3.23***	-1.91***	9.22***	5.78***	.188***

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Results

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Literature

- **Welfare analysis of fiscal reforms** by taking behavioral responses into account for several ways of constructing comparable well-being: Bargain et al. (2013), Decoster and Haan (2015), Picchio and Valletta (2018), Carpantier and Sapata (2016), Ooghe et al. (2023), Colombino and Islam (2022), ...

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- **second-best policy with double heteroganeity**: with the distinction between unemployed and inactive: Germain (2023); without the distinction: Boadway et al. (2002), Fleurbaey and Maniquet (2007), Jacquet and Van de Gaer (2011), ...

Data and Descriptive statistics

Table: Summary statistics for women with rich (full time) partner in Belgium (without social assistance and unemployed recipients).

Variable	Mean	Std. dev.	Min	Max
Income	6053.45	1886.42	1892.79	14513.94
Hours	28.075	16.31	0	60
Employed	0.797	0.402	0	1
Wage_rate_employee	26.798	9.799	8.02	73.2
Wage_rate_self_employed	27.336	13.06	6.91	79.49
Part_time_dummy	0.145	0.352	0	1
Full_time_dummy	0.633	0.482	0	1
Extra_time_dummy	0.019	0.138	0	1
Age	43.37	9.672	20	64
Primar_Education	0.0511	0.220	0	1
Lower_Secondary_Education	0.063	0.244	0	1
Higher_Secondary_Education	0.227	0.420	0	1
Tertiary_Education	0.658	0.475	0	1
No_Children	1.399	1.215	0	7
No_Children_0_3	0.109	0.329	0	2
Luxembourg_National	0.809	0.393	0	1

Note: EUSILC 2019 (EUROMOD input data) for women with rich (full time) partner in Belgium where Unemployed and Social Assistance recipients are excluded.

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3. $\hat{\gamma}_i$ computed according to Revelt and Train (2000).

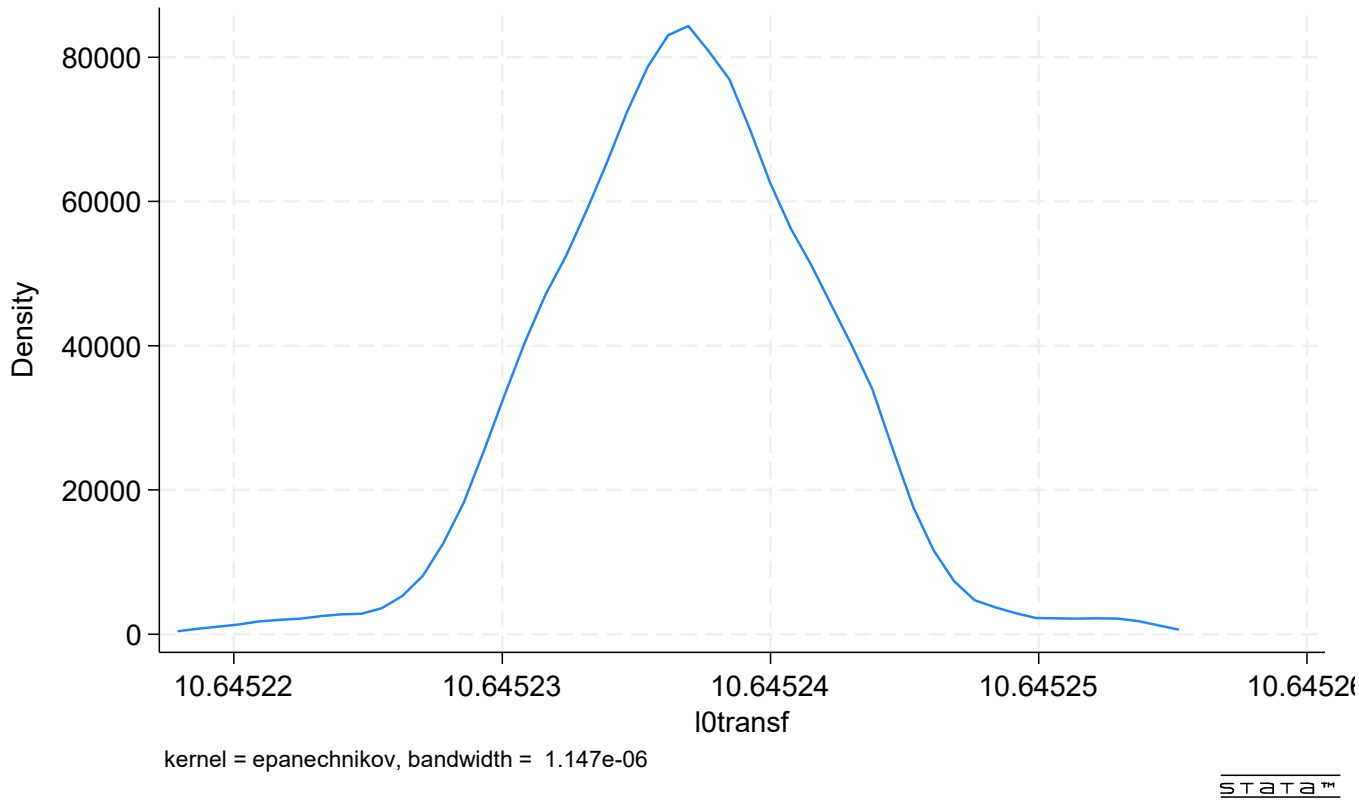
Estimates

Table: Labour Supply estimation

Variables	Coefficients	SE
Mean		
Income (Box-Cox: 0.813)	10.09***	(0.799)
Leisure (Box-Cox: -0.924)	10.65***	(2.892)
Age X Leisure	-0.412**	(0.140)
AgeSquare X Leisure	0.00550***	(0.00164)
Number of Children X Leisure	0.158	(0.121)
Number of Children Age0-3 X Leisure	0.496	(0.447)
Primar Education X Leisure	7.003***	(1.566)
Higher Secondary X Leisure	0.386	(0.312)
Nationality X Leisure	-0.716*	(0.353)
SD		
Leisure	0.000276	(0.199)
N	4 X 567 = 2268	

Standard errors in parentheses
+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Distribution of β_{2i}



Behavioral effect of UBI=30%

Table: Transition Matrix with 644 UBI

		post_reform_644UBI				
		1	2	3	4	Total
pre_reform	1	24,479	0	0	0	24,479
	2	109,318	74,857	0	0	184,175
	3	24,363	0	313,416	0	337,779
	4	0	0	0	4,819	4,819
	Total	158,160	74,857	313,416	4,819	551,252

Note: Universal Basic Income(UBI)=30% (644 Euro/month) of median of equivalised disposable income.

Atkinson, Anthony Barnes, *Public economics in action: the basic income/flat tax proposal*, Clarendon Press, 1995.

Bargain, Olivier, André Decoster, Mathias Dolls, Dirk Neumann, Andreas Peichl, and Sebastian Siegloch, "Welfare, labor supply and heterogeneous preferences: evidence for Europe and the US," *Social Choice and Welfare*, 2013, *41*, 789–817.

Boadway, Robin, Maurice Marchand, Pierre Pestieau, and Maria del Mar Racionero, "Optimal redistribution with heterogeneous preferences for leisure," *Journal of Public Economic Theory*, 2002, *4* (4), 475–498.

Carpantier, Jean-François and Christelle Sapata, "Empirical welfare analysis: when preferences matter," *Social Choice and Welfare*, 2016, *46*, 521–542.

Colombino, Ugo and Nizamul Islam, "Basic income and flat tax: The Italian scenario," in "CESifo Forum," Vol. 19 München: ifo Institut–Leibniz-Institut für Wirtschaftsforschung an der ? 2018, pp. 20–29.

_ **and** _ , *The" robot Economy" and Optimal Taxtransfer Reforms*, CHILD, Centre for Household, Income, Labour and Demographic Economics ?, 2022.

Cremer, Helmuth and Kerstin Roeder, "Means testing versus basic income: the (lack of) political support for a universal allowance," *Economics Letters*, 2015, *136*, 81–84.

Daruich, Diego and Raquel Fernández, "Universal basic income: A dynamic assessment," Technical Report, National Bureau of Economic Research 2020.

Decoster, André MJ and Peter Haan, "Empirical welfare analysis with preference heterogeneity," *International Tax and Public Finance*, 2015, *22*, 224–251.

Fleurbaey, Marc and François Maniquet, "Help the low skilled or let the hardworking thrive? A study of fairness in optimal income taxation," *Journal of Public Economic Theory*, 2007, *9* (3), 467–500.

Heckman, James J, "Sample selection bias as a specification error," *Econometrica: Journal of the econometric society*, 1979, pp. 153–161.

Hoynes, Hilary and Jesse Rothstein, "Universal basic income in the United States and advanced countries," *Annual Review of Economics*, 2019, *11*, 929–958.

Jacquet, Laurence and Dirk Van de Gaer, "A comparison of optimal tax policies when compensation or responsibility matter," *Journal of Public Economics*, 2011, *95* (11-12), 1248–1262.

McFadden, Daniel, "Conditional logit analysis of qualitative choice behavior," 1972.

Mirrlees, James A, "An exploration in the theory of optimum income taxation," *The review of economic studies*, 1971, *38* (2), 175–208.

Moene, K and Debraj Ray, "The universal basic share and social incentives," *Ideas for India*, 2016.

Ooghe, Erwin, Erik Schokkaert, and Hannes Serruys, "Fair Earnings Tax Reforms," 2023.

Parijs, Philippe Van and Yannick Vanderborght, *Basic income: A radical proposal for a free society and a sane economy*, Harvard University Press, 2017.

Picchio, Matteo and Giacomo Valletta, "A welfare evaluation of the 1986 tax reform for married couples in the United States," *International Tax and Public Finance*, 2018, *25*, 757–807.

Revelt, David and Kenneth Train, "Customer-specific taste parameters and mixed logit: Households' choice of electricity supplier," 2000.

Soest, Arthur Van, "Structural models of family labor supply: a discrete choice approach," *Journal of human Resources*, 1995, pp. 63–88.

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Group 4 constrained, receiving lower benefits than UBI;

Three types of winners

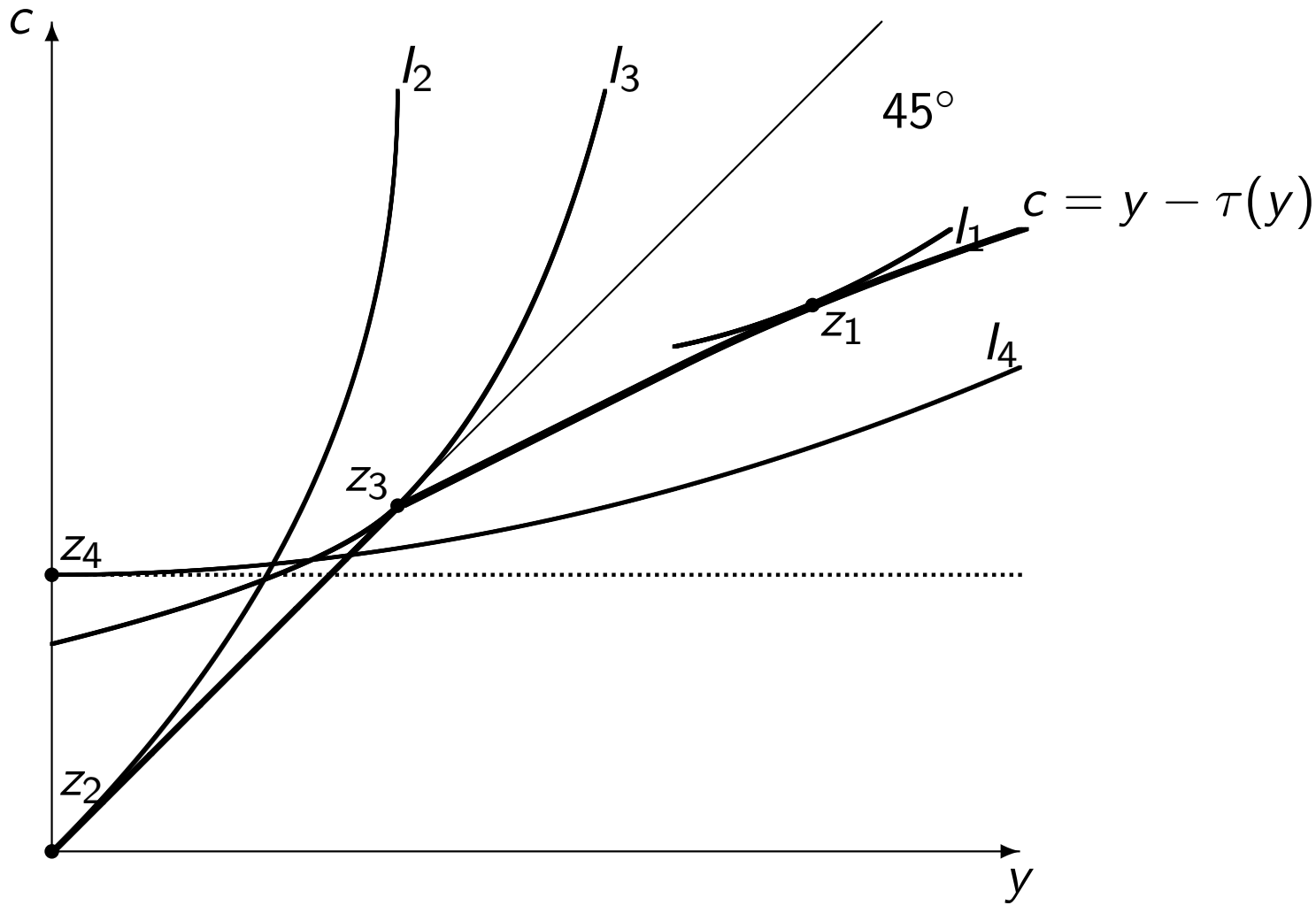

Figure: Modeling the introduction of a UBI

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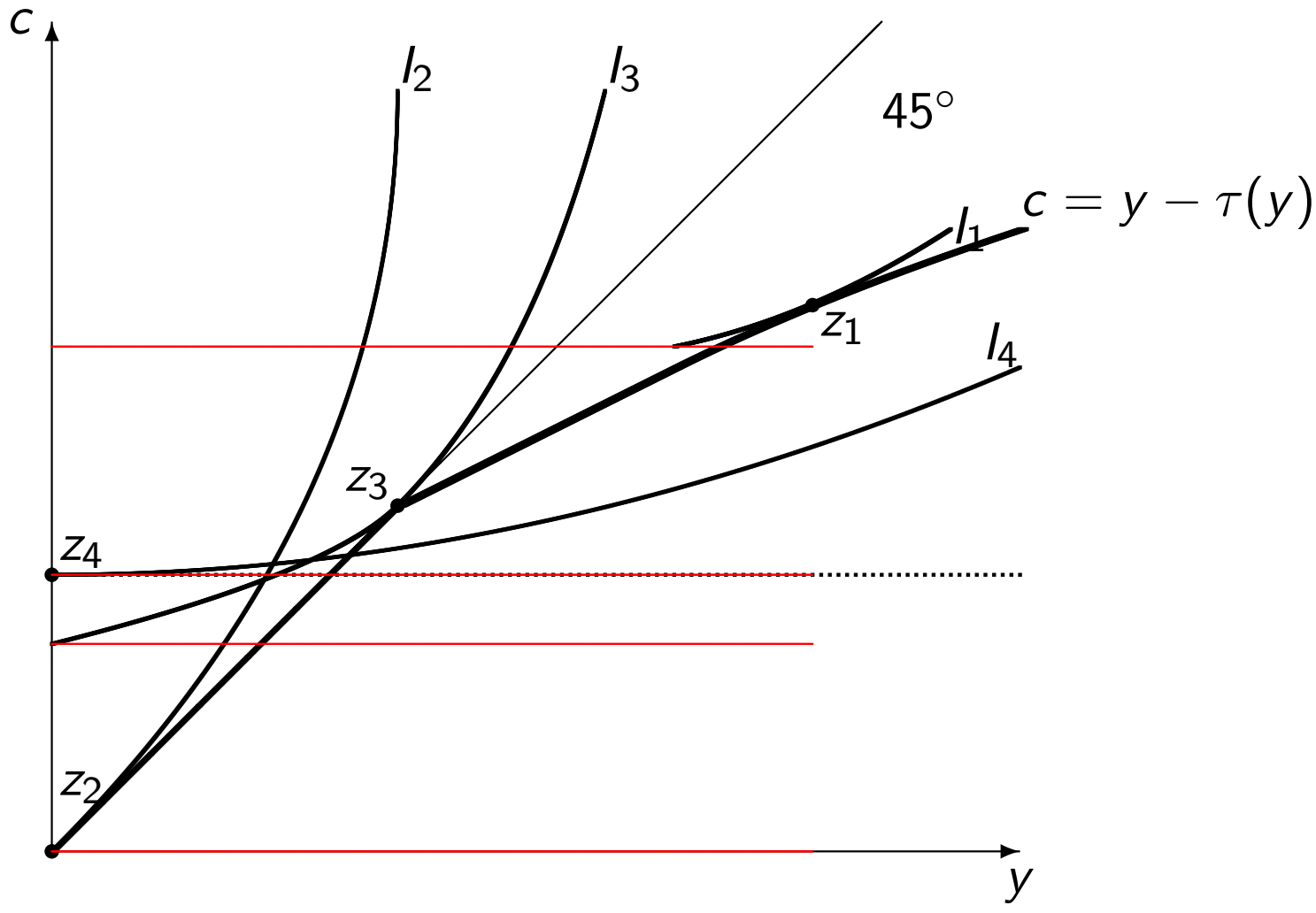

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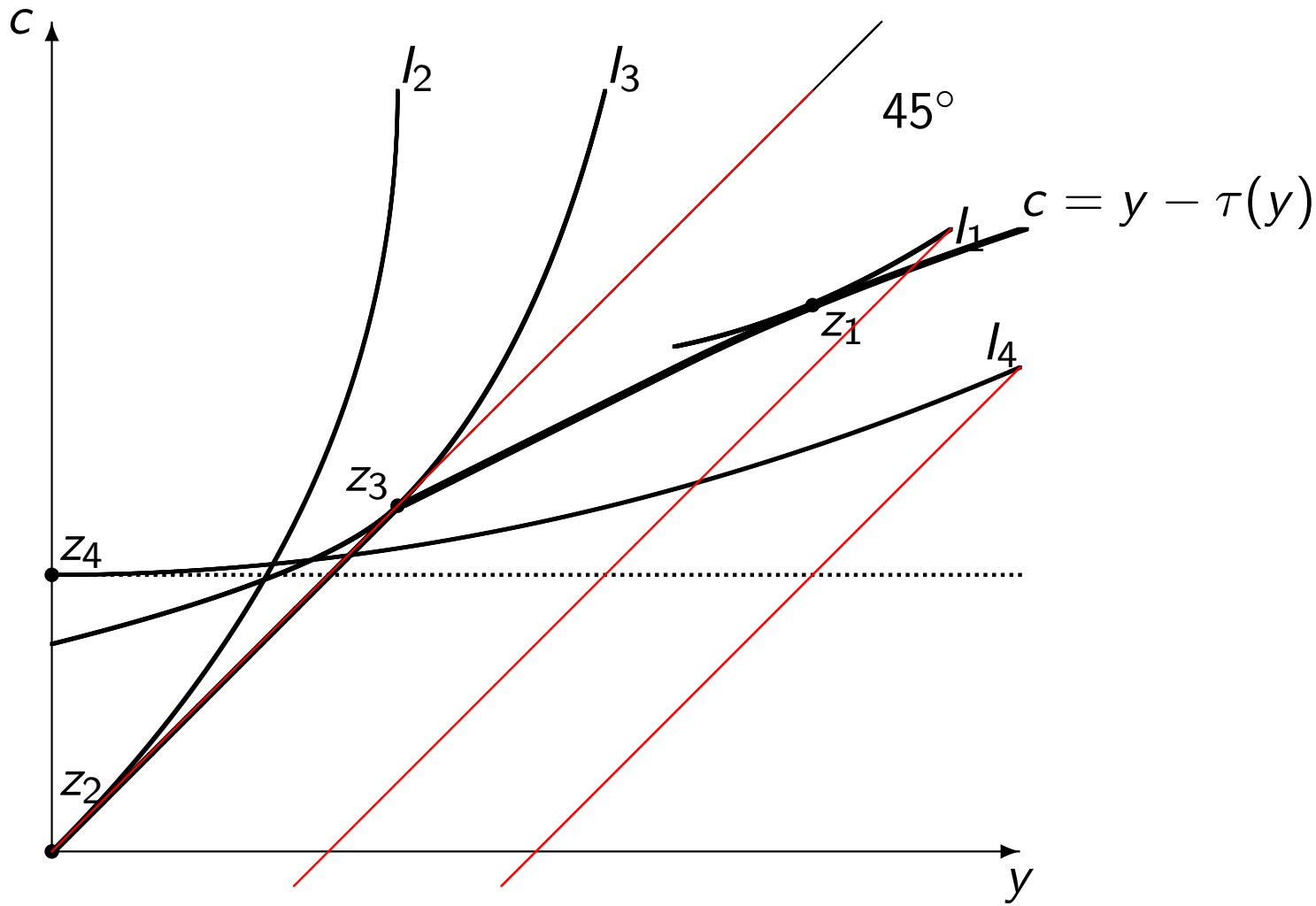

Figure: Modeling the introduction of a UBI

UBI=1074, $\tilde{w} = 0$

deciles	Losers	Win2	Win3	Win4	Total
1	2,451	6,768	30,464	3,146	42,829
2	8,780	4,462	29,367	648	43,257
3	13,005	411	28,484	0	41,900
4	10,287	2,668	28,831	1,306	43,092
5	9,928	2,158	29,971	576	42,633
6	14,293	2,568	24,553	1,002	42,416
7	16,487	1,375	24,624	0	42,486
8	17,717	0	25,167	0	42,884
9	20,570	470	21,355	0	42,395
10	17,114	0	25,134	306	42,554
Total	**130,632**	**20,880**	**267,950**	**6,984**	**426,446**

Table: Equivalent incomes by groups

UBI=1074, $\tilde{h} = 0$

deciles	Losers	Win2	Win3	Win4	Total
1	41,245	0	2,088	0	43,333
2	34,253	0	7,939	0	42,192
3	21,512	0	21,250	0	42,762
4	11,042	640	30,659	0	42,341
5	7,303	857	34,661	0	42,821
6	7,129	1,715	34,293	0	43,137
7	1,289	1,598	37,073	1,967	41,927
8	2,960	1,632	35,714	2,638	42,944
9	1,188	9,614	31,336	1,077	43,215
10	2,711	4,824	32,937	1,302	41,774
Total	**130,632**	**20,880**	**267,950**	**6,984**	**426,446**

Table: Equivalent incomes by groups

UBI=1074, $\tilde{w} = 0$, conditional

deciles	Losers	Win2	Win3	Win4	Total
1	19,475	6,768	13,404	3,146	42,793
2	35,417	4,462	2,473	648	43,000
3	35,521	411	6,783	0	42,715
4	36,813	2,668	2,327	1,306	43,114
5	36,907	2,158	2,906	576	42,547
6	35,922	2,568	3,132	1,002	42,624
7	40,546	1,375	1,041	0	42,962
8	39,990	0	2,894	0	42,884
9	41,925	470	0	0	42,395
10	41,086	0	1,162	306	42,554
Total	**363,602**	**20,880**	**36,122**	**6,984**	**427,588**