



# *EFFECTIVE TAX RATES: FORWARD AND BACKWARD LOOKING MEASURES*

**Giorgia Maffini**

OECD, Centre for Tax Policy and Administration

Ministero delle Finanze, Rome, 12 April 2017



# Effective rates

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- Two types of effective rates
  - Backward-looking rates
  - Forward-looking rates
- Show how we have used them



# Forward-looking rates

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- Theory: investment consists of cash flows in present & future
- Forward-looking measures should be generally preferred (Devereux, Maffini, 2006) to measure the effects of tax system on incentives to invest
  - In practice there are drawbacks (later)
- Typically calculated for **hypothetical investment** on basis of the rules for the tax base and tax rate, and can be computed for any well-defined investment project
- Very helpful when comparing incentives of tax system across jurisdictions, sectors, projects financed in different ways, etc.



## Forward-looking rates

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- At Oxford, mainly used for advising and commenting on tax policy measures in the UK and abroad
- At both Oxford CBT and OECD, EMTRs and EATR<sub>s</sub> calculated using Devereux and Griffith (1999, 2003)
- Two examples

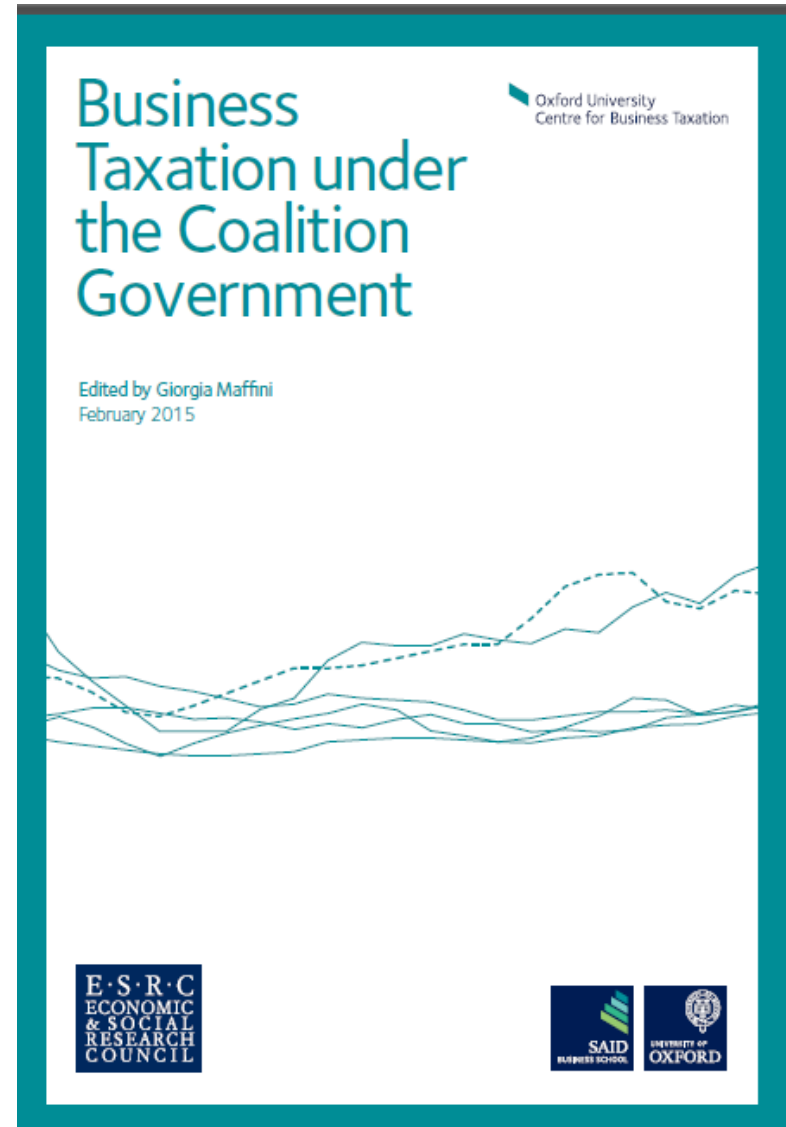


# Forward-looking rates

Evaluation of measures taken by UK 2010-15 Coalition government to reform the business tax regime

- The government's aims (2010):  
*“We will reform the corporate tax system by simplifying reliefs and allowances, and tackling avoidance, in order to reduce headline rates.*


***Our aim is to create the most competitive corporate tax regime in the G20”***



## Year: 2015; G20 countries ranking

Country	Statutory corporate rate	Country	EATR	Country	EMTR
<b>1</b> UK	<b>20%</b>	Russia	16.71%	Italy	-9.81%
<b>2</b> Russia	20%	Turkey	16.91%	Korea	7.19%
<b>3</b> Saudi Arabia	20%	Korea	18.01%	Russia	7.89%
<b>4</b> Turkey	20%	Saudi Arabia	18.08%	Turkey	8.73%
<b>5</b> Korea	22%	<b>UK</b>	<b>18.49%</b>	Saudi Arabia	13.36%
<b>6</b> China	25%	China	22.38%	South Africa	14.83%
<b>7</b> Indonesia	25%	Indonesia	23.01%	Canada	14.92%
<b>8</b> Canada	26.75%	Canada	23.27%	China	16.23%
<b>9</b> South Africa	28%	Italy	23.81%	Mexico	17.09%
<b>10</b> Australia	28.5%	South Africa	24.13%	<b>UK</b>	<b>17.14%</b>
<b>11</b> Mexico	30%	Australia	25.29%	Australia	17.98%
<b>12</b> Italy	30.04%	Mexico	26.11%	Germany	18.17%
<b>13</b> Germany	30.95%	Germany	27.04%	Indonesia	18.52%
<b>14</b> India	33.99%	India	30.22%	France	19.92%
<b>15</b> Brazil	34%	Brazil	30.68%	India	22.27%
<b>16</b> Argentina	35%	Japan	31.50%	Japan	22.85%
<b>17</b> Japan	35.64%	Argentina	32.26%	USA	23.25%
<b>18</b> France	38%	France	32.35%	Brazil	23.91%
<b>19</b> USA	40.46%	USA	34.85%	Argentina	27.00%

## Year: 2020; G20 countries ranking

 Country	Statutory corporate rate	Country	EATR	Country	EMTR	
<b>1</b>	Northern Ireland	12.5%	Northern Ireland	11.99%	Italy	-7.67%
<b>2</b>	<b>Great Britain</b>	<b>17%</b>	<b>Great Britain</b>	<b>15.82%</b>	Korea	7.16%
<b>3</b>	Indonesia	18%	Indonesia	16.56%	Russia	7.89%
<b>4</b>	Russia	20%	Russia	16.71%	Turkey	8.73%
<b>5</b>	Saudi Arabia	20%	Turkey	16.91%	Northern Ireland	10.67%
<b>6</b>	Turkey	20%	Korea	18.00%	Indonesia	12.99%
<b>7</b>	Korea	22%	Saudi Arabia	18.08%	Saudi Arabia	13.36%
<b>8</b>	China	25%	Italy	21.35%	France	13.95%
<b>9</b>	Italy	26.54%	China	21.43%	<b>Great Britain</b>	<b>14.51%</b>
<b>10</b>	Canada	26.75%	Canada	23.27%	South Africa	14.83%
<b>11</b>	South Africa	28%	France	23.70%	Canada	14.92%
<b>12</b>	India	28.84%	South Africa	24.13%	China	15.61%
<b>13</b>	France	28.92%	India	25.63%	Mexico	17.09%
<b>14</b>	Australia	30%	Mexico	26.11%	Germany	18.17%
<b>15</b>	Mexico	30%	Australia	26.63%	India	18.34%
<b>16</b>	Germany	30.95%	Germany	27.04%	Australia	19.09%
<b>17</b>	Japan	33.06%	Japan	29.21%	Japan	20.87%
<b>18</b>	Brazil	34%	Brazil	30.68%	USA	23.25%
<b>19</b>	Argentina	35%	Argentina	32.26%	Brazil	23.91%
<b>20</b>	USA	40.46%	USA	34.85%	Argentina	27.00%



# UK – preserving competitiveness

G20 Ranking		
	EATR (5 <sup>th</sup> in 2015)	EMTR (10 <sup>th</sup> in 2015)
<b>Capital Allowance 20%</b>	1 <sup>st</sup>	8 <sup>th</sup>
<b>Capital Allowance 25%</b>	1 <sup>st</sup>	6 <sup>th</sup>
<b>Corp. Tax Rate 15%</b>	1 <sup>st</sup>	5 <sup>th</sup>
<b>Allowance for buildings 4%</b>	1 <sup>st</sup>	5 <sup>th</sup>
<b>ACE</b>	1 <sup>st</sup>	2 <sup>nd</sup>

“*Tax Competition, Tax Co-Operation and BEPS*”, Oxford University Centre for Business Taxation Working paper no. 15/13, 2016 with Richard Collier.

<http://www.sbs.ox.ac.uk/faculty-research/tax/publications/working-papers-o/uk-international-tax-agenda-business-and-impact-oecd-beps-project>





# The OECD ETR Model

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Structure: 2 separate model files used to calculate outcome variables

ETAX\_DEPRECIATION: Period-by-period calculation of cash flows

- Only CIT; corporate-level; equity financed; no inventories or wealth taxation
- More intuitive approach; easier to use for country-level evaluations; analysis of specific depreciation and tax incentive schemes

ETAX: Complete theoretical model

- Including Personal Income Taxation (PIT), inventory valuation; corporate wealth taxation
- Sources of Finance: Retained Earnings, New Equity, Debt
- More efficient approach; comparison across many different assets/countries; analysis of a wider range of tax policy questions
- *ETRs from CBT/ZEW databases can be reproduced*



# Backward-looking rates

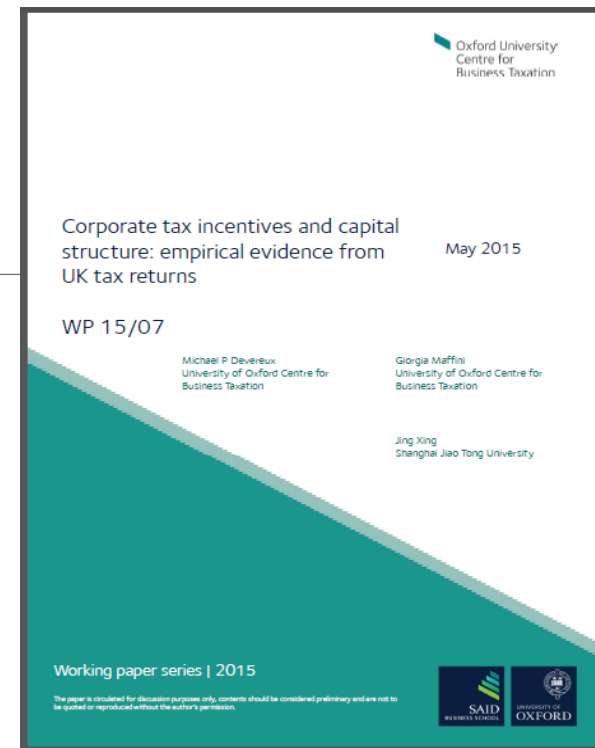
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- Forward-looking rates not used in much academic research in the last years as research has moved
  - From using macro/cross-country data to micro-data
  - Use of confidential corporate tax returns
- When we look at the firm-level, forward looking rates may be too aggregated
  - Although in theory could be calculated at firm-level
  - Less precise than what you get in tax returns
- Back to backward-looking rates
  - Very precise as we are looking at tax returns
  - Endogenous



# Backward-looking rates

- Does the corporate tax system affect financing choices?
- Use corporate tax returns
  1. Can exactly calculate the MTR
  2. MTR endogenous:
    - Calculated using taxable profits after interest deduction. Higher leverage would tend to have higher interest payments and hence lower after-financing taxable profits, mechanically implying that the leverage ratio is negatively correlated with the after-financing marginal tax rate.
    - Moreover, with the presence of kinks in the tax rate schedule, companies could be induced to use more debt to shift into the tax bracket with a lower tax rate.





# Backward-looking rates

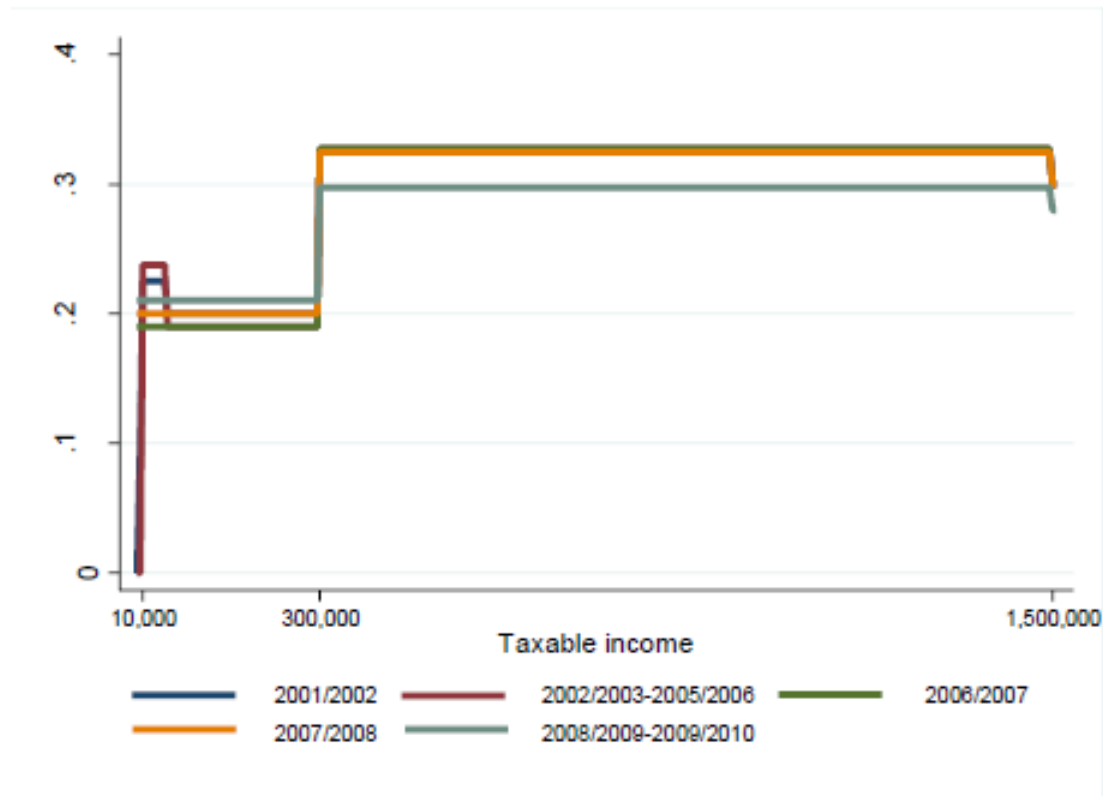


Figure 1. Statutory corporate income tax rate in the UK. This figure shows the statutory marginal tax rates for different corporate income tax brackets during the fiscal years 2001/2002-2009/2010 in the United Kingdom.



## Backward-looking rates

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- Our results suggest a much larger impact of taxation on leverage than is found in the previous literature
- In the long run: a one percentage point rise in the corporation tax rate would increase the leverage ratio by around 1 percentage point (our central estimates range from 0.76 to 1.40, depending in the instrument)
- Compare data from tax returns with accounting data: much stronger effect of tax on leverage with tax returns

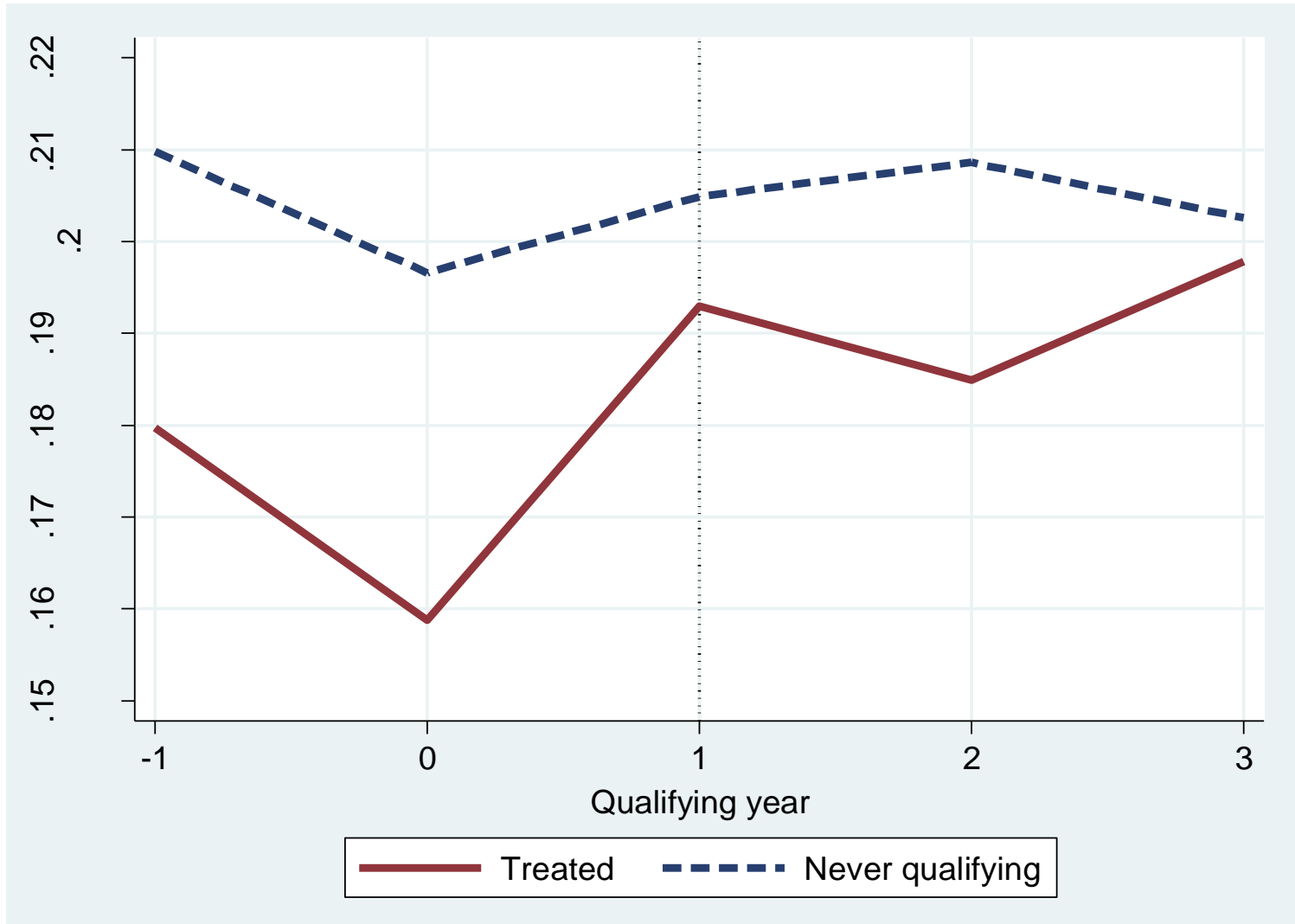


# Backward-looking rates

- Does the corporate tax system affect investment decisions?
- Changes in capital allowances in the UK: some firms can enjoy more generous allowances from 2004
- Need to control for changes in the rate so to be able to identify the pure effect of more generous capital allowances



# Average gross investment rate





# Backward-looking rates

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- Investment rate increased between 2.1 and 2.6 ppt when firms became qualified for FYAs, relative to firms that never qualified.
- This implies an increase in investment rate of 11% at the mean
- We exploit exogenous variation in the timing of tax payments to show that this large effect is not due to an increase in available cash (cash flow effect) and hence, this is primarily a cost of capital effect. Our results can therefore be fully translated into an elasticity of investment with respect to the user cost of about 8.7
- Firms respond rather quickly to FYAs, within 12 to 18 months
- Firms also bunch just below notches in the cost of capital created by the qualifying thresholds, suggesting salience of the FYAs. Such behaviour does not drive our main results





# Contact details

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## Giorgia Maffini

Deputy Head, Tax Policy and Statistics Division

Centre for Tax Policy and Administration

2, rue André Pascal - 75775 Paris Cedex 16  
Tel: +33 1 45 24 15 14 – Fax: +33 1 44 30 63 51

[giorgia.maffini@oecd.org](mailto:giorgia.maffini@oecd.org) || [www.oecd.org/tax](http://www.oecd.org/tax)