

Online Appendix

In this appendix we investigate the theoretical effect of Mutual Agreement Procedures and minimum taxation on transfer price corrections.

A Potential Adverse Effects of Improving Mutual Agreement Procedures

Mutual agreement procedures facilitate agreements between tax authorities on the relocation of taxable profit. When an agreement is reached, a transfer price correction in one country is offset by an equal reduction in the tax base of the counterpart country. This matters to firms when the counterpart country has a high tax rate (since the corresponding tax reduction will be large) and matters less if the counterpart country has a low tax rate. In the extreme case where the counterpart country has a zero tax rate, there is no point for a firm to request a mutual agreement procedure.

Since the end of the 1990s, there has been a push to advance mutual agreement procedures. The OECD has played a key role in this process through the 1996 OECD Model Tax Convention (article 25) and in 2014 through its Base Erosion and Profit Shifting (BEPS) initiative, whose action 14 seeks to “make dispute resolution mechanisms more effective.” In parallel, the European Union has enhanced dispute resolution through the EU Arbitration Convention and the EU joint transfer pricing forum. In this forum EU states are held accountable as to the ease and speed with which they facilitate dispute resolutions.

The push for facilitating mutual agreement procedures has lowered the length of procedures and increased the number of cases markedly—particularly in high-tax countries. The OECD has since 2006 collected statistics on the number of newly started and closed mutual agreement procedures. The number of cases has more than doubled from 2006 to 2018, from 1,036 cases initiated in 2006 to 2,385 in 2018.¹⁹ The push for making dispute settlement more efficient accelerated in 2016, when the OECD began implementing BEPS through the inclusive framework (consisting of 137 countries). The average time to settle disputes fell after 2016, from 40 months to less than 7 months.²⁰ The number of initiated mutual agreement procedures rose 59% from 2016 to 18. This increase was primarily driven by an increase of new cases involving non-tax havens, which accounted for 87% of new procedures (see Online Appendix Figure A5).

We model mutual agreement procedures as an increase in the relative yield from correcting transactions between high-tax countries compared to transactions with the low-tax country, i.e., an increase in $\frac{\gamma_H}{\gamma_L}$.

Proposition A1: *If we interpret an improvement of the mutual agreement procedures as an increase in $\frac{\gamma_H}{\gamma_L}$ it follows from proposition 1 that improving mutual agreement procedures will*

¹⁹See OECD MAP Statistics. Note that the increase in cases is likely larger, as numbers before the establishment of guidelines in 2016 may double count cases (<https://www.oecd.org/tax/dispute/mutual-agreement-procedure-statistics.htm>).

²⁰See <https://www.oecd.org/tax/dispute/mutual-agreement-procedure-statistics-2017.htm>. Note that the the average time for cases after 2016 is under-estimated due to some cases being still ongoing.

increase the amount of profits shifted to the low-tax country—insofar as the tax authority is sufficiently capacity constrained ($\bar{n} < \frac{1}{2}$).

By increasing the yield of correcting transactions with high-tax countries, mutual agreement procedures increase the opportunity cost of correcting transactions with low-tax countries. The shift of resources by the tax authority allows the tax-planning firm to shift more income to tax havens. This implies that strengthening mutual agreement procedures may increase the scope for intentional profit shifting. We note, however, that mutual agreement procedures can raise welfare in ways not modeled here. For instance, they may enhance trade by reducing risks of double taxation.

B Effects of Country-By-Country Minimum Taxation

A number of countries have implemented country-by-country minimum taxation through controlled foreign corporation rules.²¹ The OECD has laid out a Global Anti-Profit Shifting proposal that would include minimum country-by-country taxation (OECD 2019b). In such a regime, a subsidiary facing a tax rate t lower than a given minimum rate t_{min} would be taxed at rate $t_{min} - t$ in its home country.

To understand how minimum taxation would affect the incentives of tax authorities, we introduce country-by-country minimum taxation in country H1. To begin with we assume that the the minimum tax rate is above the tax rate in the low-tax country ($t_L < t_{min}$) but below the rate in the high-tax country H2 ($t_H > t_{min}$) and that both multinationals have their parent in country H1. These assumptions are consistent with the current country-by-country minimum tax rules in force and the OECD (2019b) proposal. In this case profits reported by the tax-planning firm will be subject to some taxation in country H1 (taxed at $t_{min} - t_L$) while none of the reported profits in country H2 are subject to taxation in country H1. The expected value for H1 of correcting the transfer price involving the low-tax country falls to $(t_{H1} - t_{min})\gamma_L(p^L - p^a)$, which is a fraction $1 - t_{min}$ of the expected value without minimum taxation. Country-by-country minimum taxation lowers the expected value of correcting the tax planning firm. In turn this allows the tax planning firm to shift more profits to the low-tax country. The new equilibrium level of profit shifting to the low-tax country becomes:

$$p_*^L - p^a = \begin{cases} \frac{\gamma_H}{\gamma_L(1-t_{min})}(b - 2b\bar{N}) & \text{if } \bar{N} < \frac{1}{2} \\ 0 & \text{if } \bar{N} \geq \frac{1}{2} \end{cases} \quad (15)$$

Profit shifting to the low-tax country increases by a factor of $1 - t_{min}$ if the tax authority is sufficiently constrained. Of course, this result changes dramatically if the minimum tax rate is set equal to the tax rate in country H1 (i.e., H1 adopts worldwide taxation). With $t_{min} = t_{H1} = t_{H2}$ the tax planning firm has no incentive to shift profit.

²¹A recent example is given by the US GILTI regime: <https://www.irs.gov/newsroom/irs-and-treasury-issue-guidance-related-to-global-intangible-low-taxed-income-gilti>.

Proposition A2: *With country-by-country minimum taxation binding in the low-tax country and non-binding in the high-tax country, profit shifting to the low-tax country rises in equilibrium, insofar as the tax authority is sufficiently capacity constrained ($\bar{n} < 1/2$).*

Importantly, the tax loss due to changes in transfer price enforcement may easily be smaller than the additional direct tax revenue gains from minimum taxation. It also easily may be lower than the tax revenue gains derived from the decrease in the incentive to shift profits caused by the reduction in the tax differential between high-tax and low-tax countries (not modeled in our paper). In the extreme case where $t_{min} = t$, there would be no loss of tax revenue from profit shifting anymore.

Table A1: Annual Revenue of Danish Transfer Price Corrections Using Effective Tax Rates

	[1]	[2]	[3]
<i>Panel a: Tax-motivated profit shifting</i>	All countries	Non-tax havens	Tax havens
Amounts (€, Millions)	2215	-455	2670
% of tax base	6%	-2%	8%
<hr/>			
<i>Panel b: Transfer price corrections</i>			
Corrections (# of cases)	62	44	18
Corrections (€, Millions)	1456	1190	266
Corrections (% of total)	100%	82%	18%
<hr/>			
<i>Panel c: Estimated tax revenue impact (€, Millions)</i>			
Implied increase in tax revenue in Denmark	218	178	40
Implied decrease in tax revenue abroad	268	260	8
Net change in global tax bill if fully realized	-49	-81	32

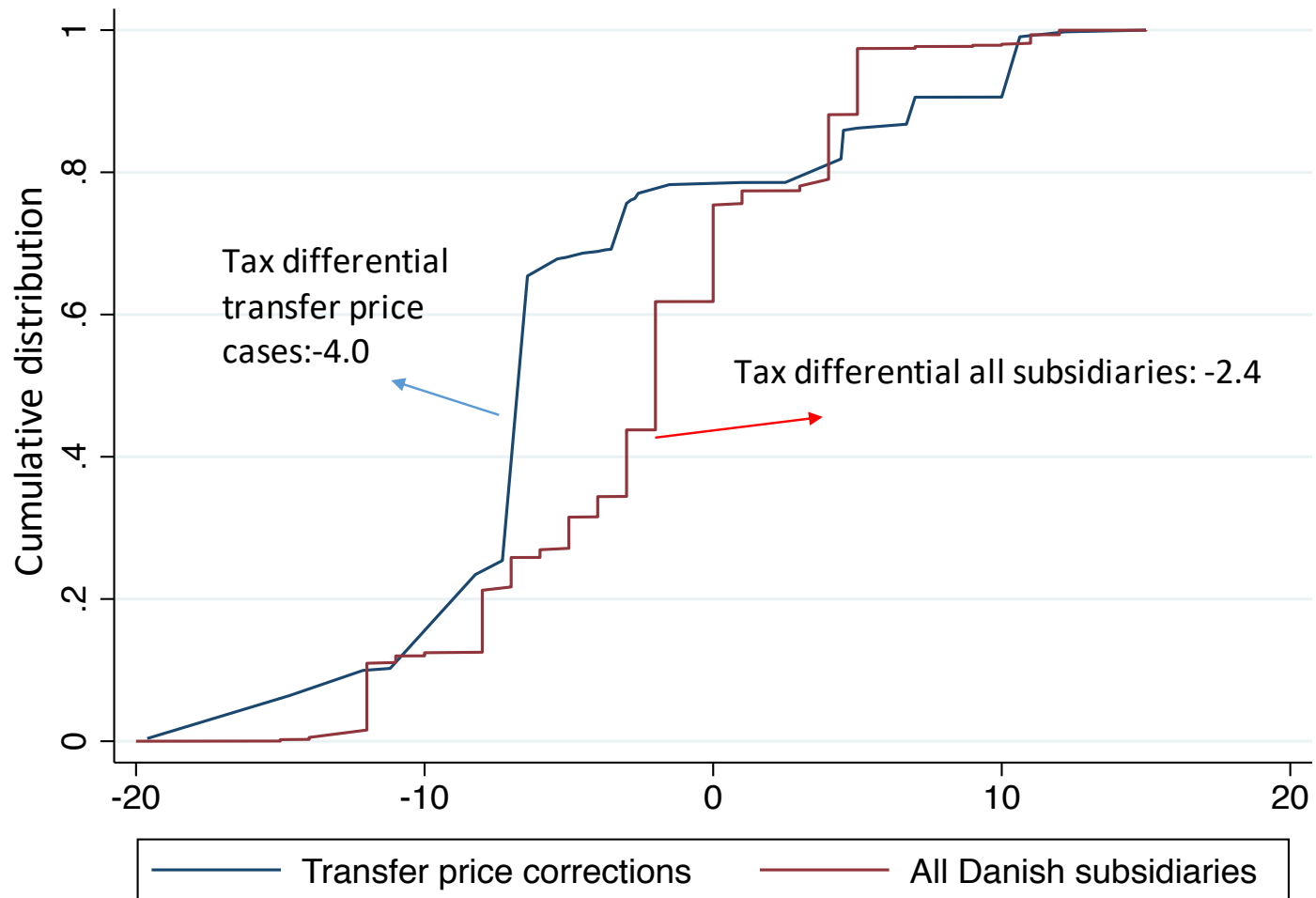
Notes: This table replicates Table 1 using effective tax rates instead of statutory rates for the computations in panel C. Effective tax rates from Tørsløv et al. (2020) are used. See notes to Table 1.

Table A2: Denmark's Transfer Price Corrections: Domestic vs. Foreign Multinationals

	[1]	[2]	[3]
<i>Panel a: Transfer price corrections (HQ in Denmark)</i>	All countries	Non-tax havens	Tax havens
Corrections (# of cases)	20	6	14
Corrections (€, Millions)	434	252	182
Corrections (% of total)	100%	58%	42%
Implied increase in tax revenue in Denmark	95	55	40
Implied decrease in tax revenue abroad	75	68	7
Net change in global tax bill if fully realized	20	-13	33
<i>Panel a: Transfer price corrections (HQ outside Denmark)</i>	All countries	Non-tax havens	Tax havens
Corrections (# of cases)	41	38	4
Corrections (€, Millions)	1022	943	79
Corrections (% of total)	100%	92%	8%
Implied increase in tax revenue in Denmark	225	207	17
Implied decrease in tax revenue abroad	259	256	3
Net change in global tax bill if fully realized	-34	-49	14

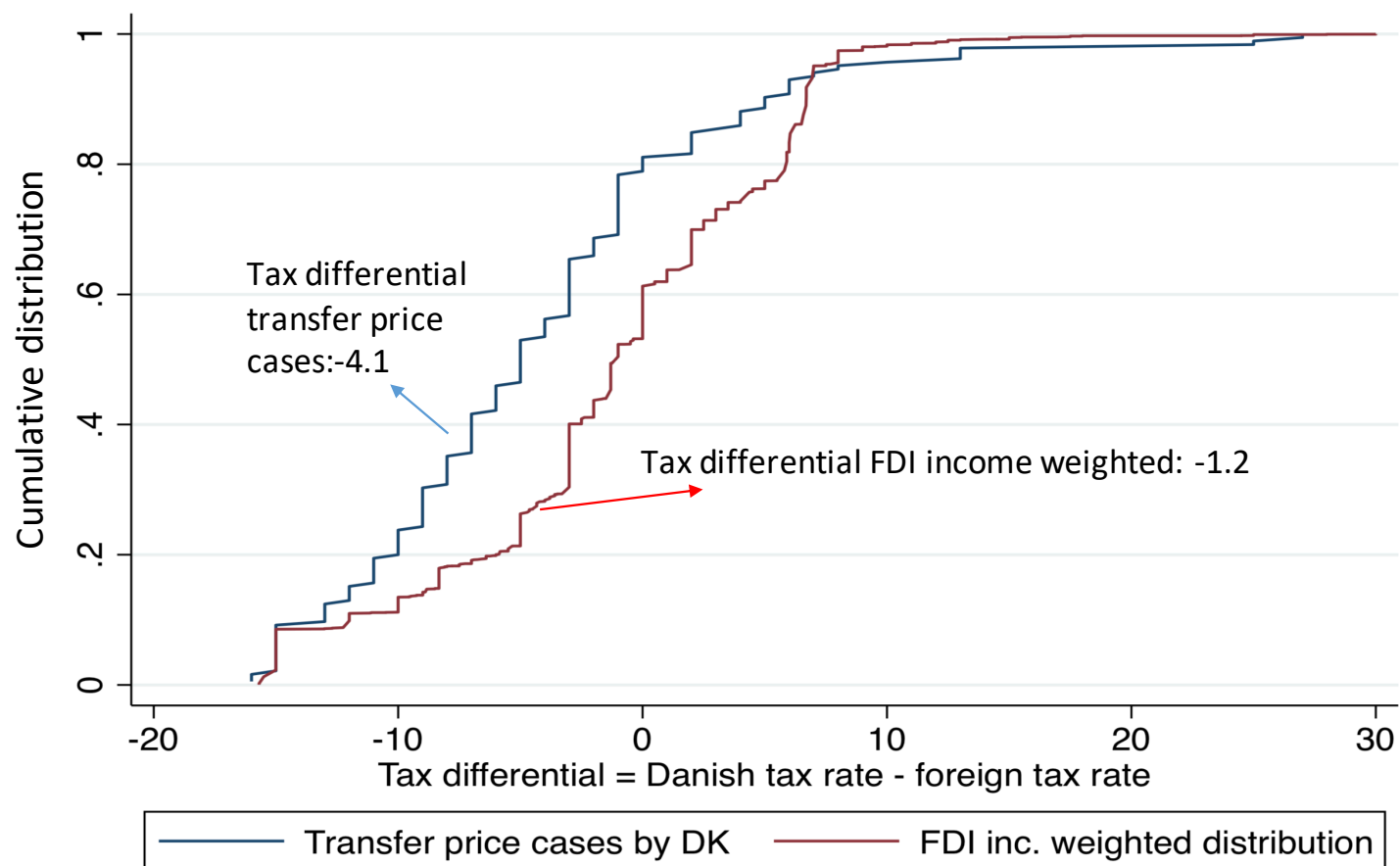
Notes: This table replicates Table 1 but separately reports results for multinationals headquartered in Denmark vs. subsidiaries of non-Danish multinationals. See notes to Table 1.

Figure A1: The Distribution of Tax Differentials, Using Effective Tax Rates



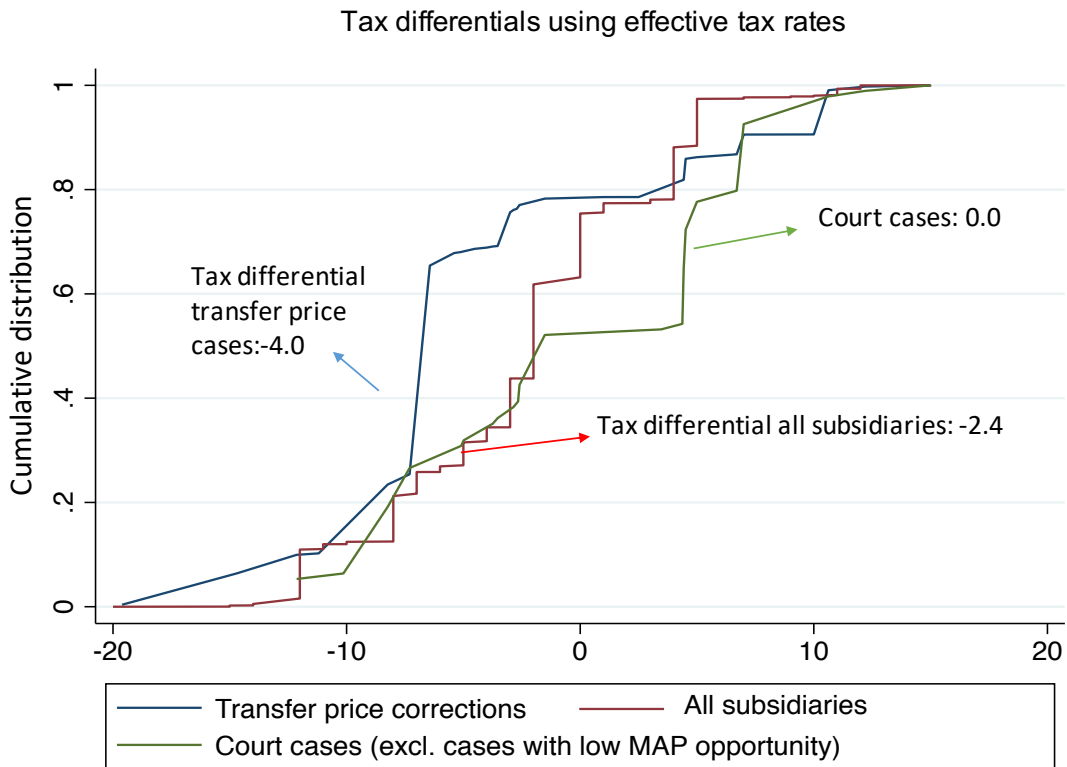
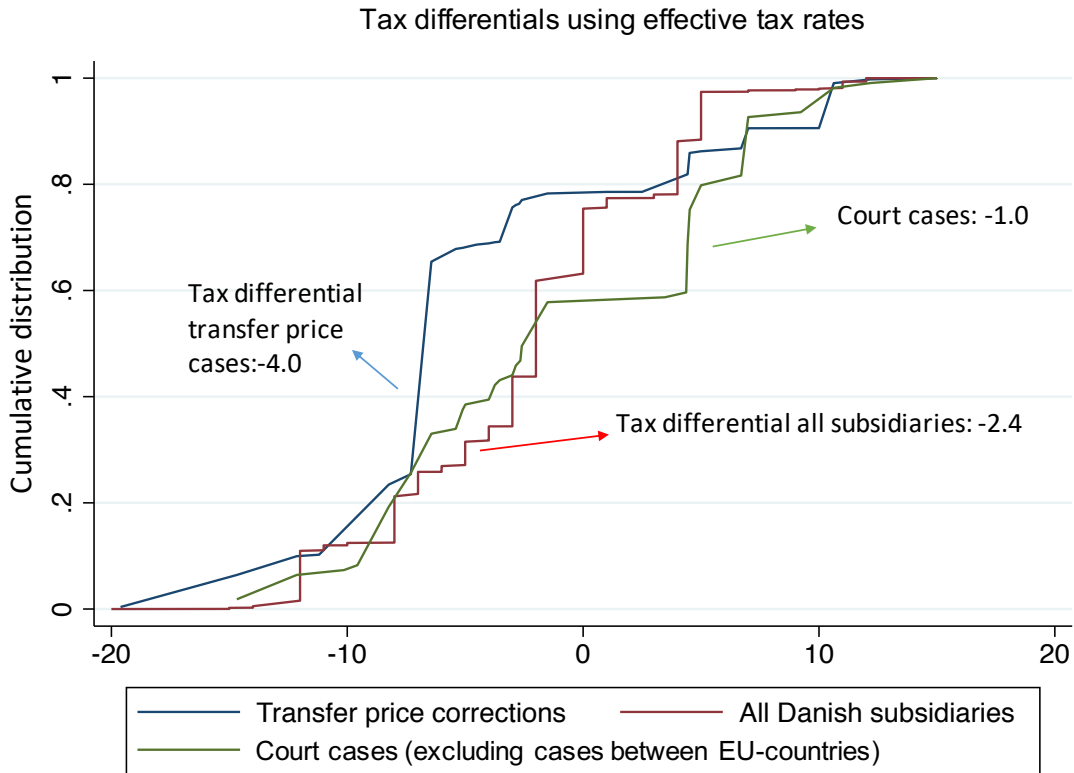
Notes: This figure replicates figure 2 using effective tax rates from Tørsløv et al. (2020) instead of statutory tax rates; see notes to Figure 2.

Figure A2: The Distribution of Tax Differentials, Using FDI Income Weights



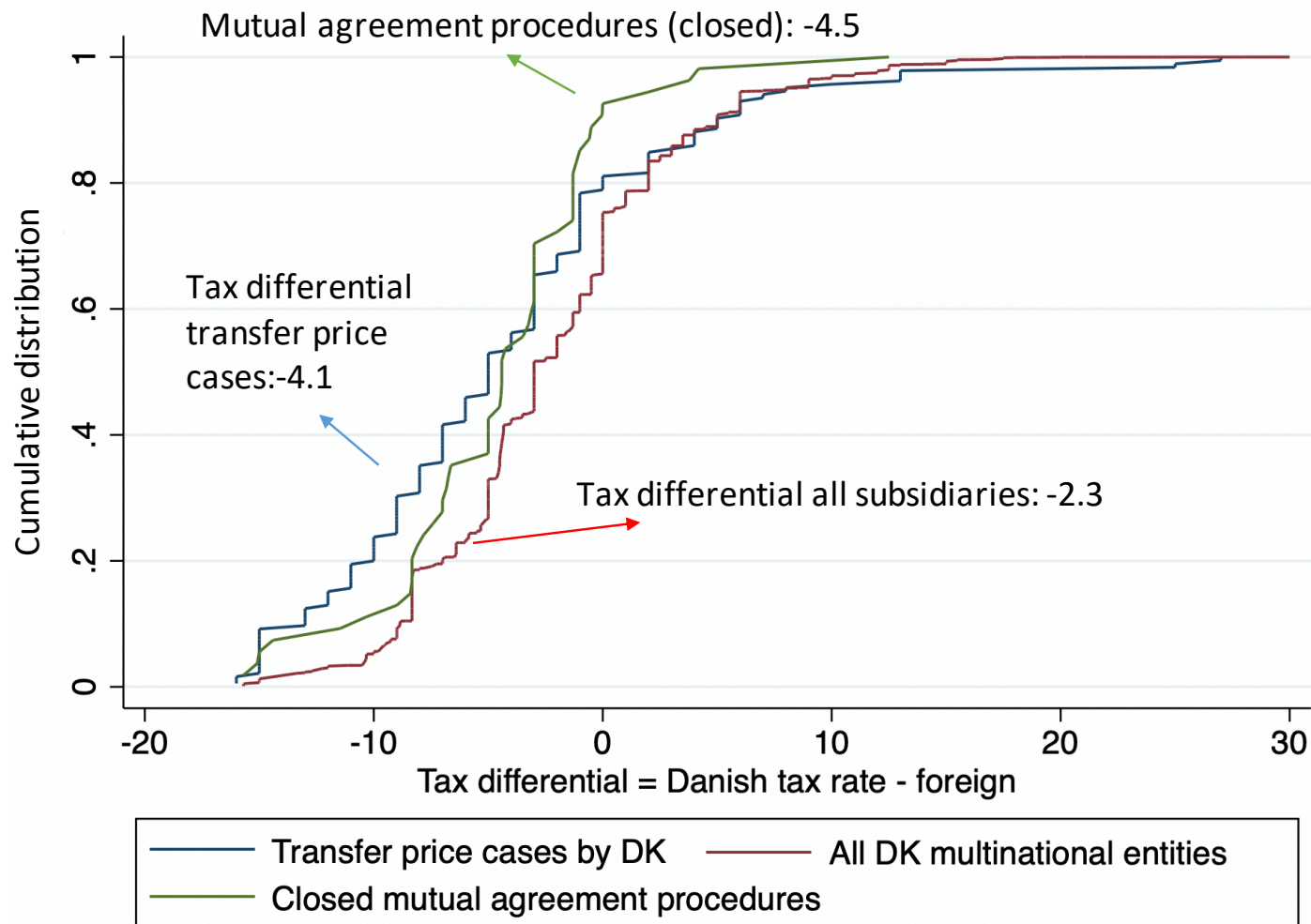
Notes: This figure shows the cumulative distribution of the tax differentials across all Danish transfer pricing cases and across all Danish vis-a-vis foreign firm linkages. The tax differential is defined as the Danish corporate tax rate less the counterpart country tax rate. Tax rates are from KPMG (2018). The blue line shows the distribution of tax differentials in all transfer price corrections in 2009, 2014 and 2015. The red line shows the tax differential between Denmark and all foreign countries weighted according to total (inward and outward) foreign direct investment (FDI) income in 2015. Source: Danish Inland Revenue, Tørsløv et al. (2020), KPMG (2018), Eurostat table “bop fdi6 inc” and authors’ computations (see text).

Figure A3: Tax Differentials in Court Cases Using Effective Rates



Note: This figure replicates figure 3 using effective tax rates from Tørsløv et al. (2020) instead of statutory tax rates (see notes for Figure 3).

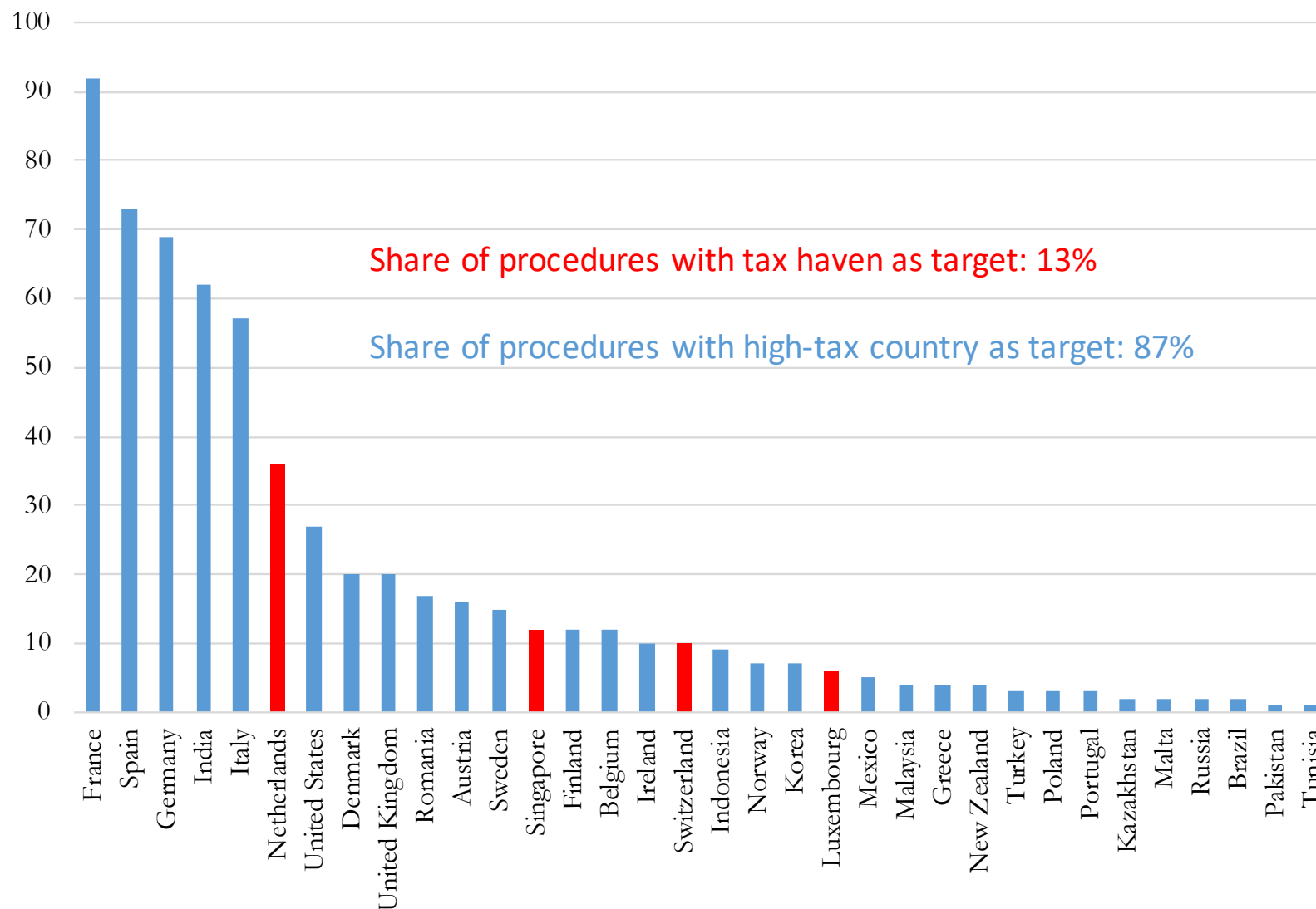
Figure A4: Distribution of Tax Differentials in Completed Mutual Agreement Procedures



Notes: This figure shows the cumulative distribution of the tax rate differential (Danish minus foreign rate) across all mutual agreement procedures completed from 2008 to 2015 (green line). This distribution is contrasted to the distribution of the tax differential in Danish transfer pricing cases (blue line) and the distribution of the tax differential between all Danish multinational entities (subsidiaries and parents) and their foreign related parties (red line). Tax rates are from KPMG (2018). Source: Danish Inland Revenue, Tørsløv et al. (2020), KPMG (2018), and authors' computations (see text).

Figure A5: New Mutual Agreement Procedures Initiated Globally in 2016–2018

MAP cases started, 2016-2018



Notes: The graph shows the target of mutual agreement procedures following transfer price corrections in the 137 member countries of the OECD inclusive framework. Countries reporting zero mutual agreement procedures are left out of the chart. Tax havens are marked in red using the definition from Tørsløv et al. (2020). Source: OECD MAP statistics