Treaty Shopping, Race to the Bottom, and Treaty Cascades

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July 8, 2023
2023 Pacific International Politics Conference

Governments Have Been Aware of Int'l Tax Avoidance 100+ Years Ago

H.R. Rep. No. 350, 67 Cong., 1st Sess., 14 (1921).

"Subsidiary corporations, particularly foreign subsidiaries, are sometimes employed to 'milk' the parent corporation, or otherwise improperly manipulate the financial accounts of the parent company."

But Why It Persists?

THE WALL STREET JOURNAL.

WORLD

Companies Avoid Paying $200 Billion in Tax

Businesses avoid taxes by channeling their overseas' investments through offshore financial hubs

By Paul Hannon Follow

June 24, 2015 1:00 pm ET

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  - The universe of BTTs since 1900 (3900+ BTTs and $\sim$ 900 amendments)
  - Worldwide statutory withholding tax rates (1980 - 2020)

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  - Cascades: New BTT Formation $\Rightarrow$ More Treaty Shopping Risks

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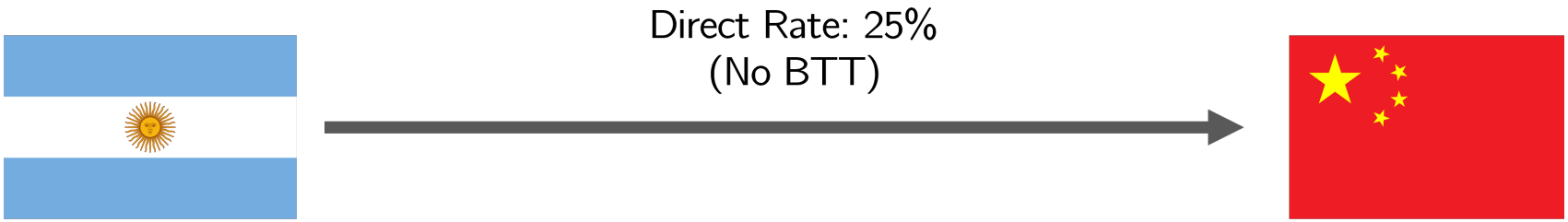
  - For SSA countries, $\sim$ 15% CIT revenue (Beer and Loeprick 2018)
- BTTs as vehicles for tax avoidance through profit-shifting
  - \$200-300 billion annual loss (Garcia-Bernardo and Janský 2022)

Tax Treaty Shopping: Interest Payment from Argentina to China (2017)



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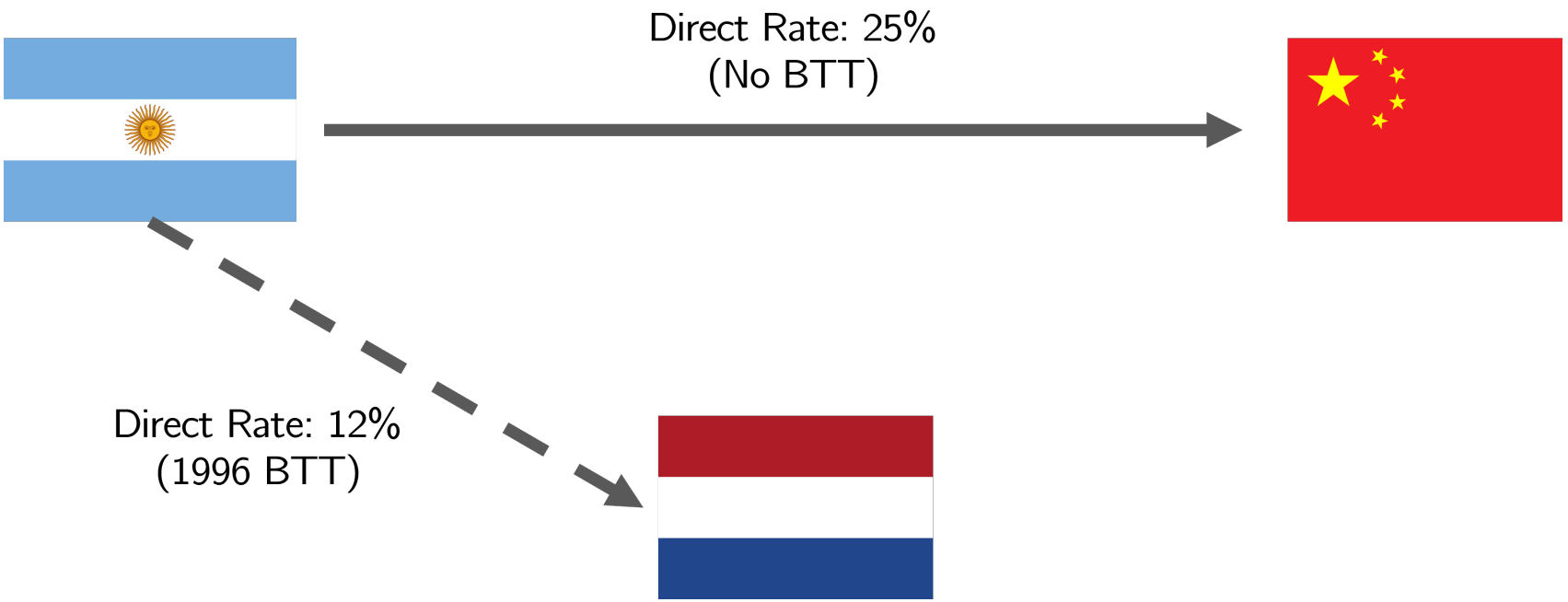

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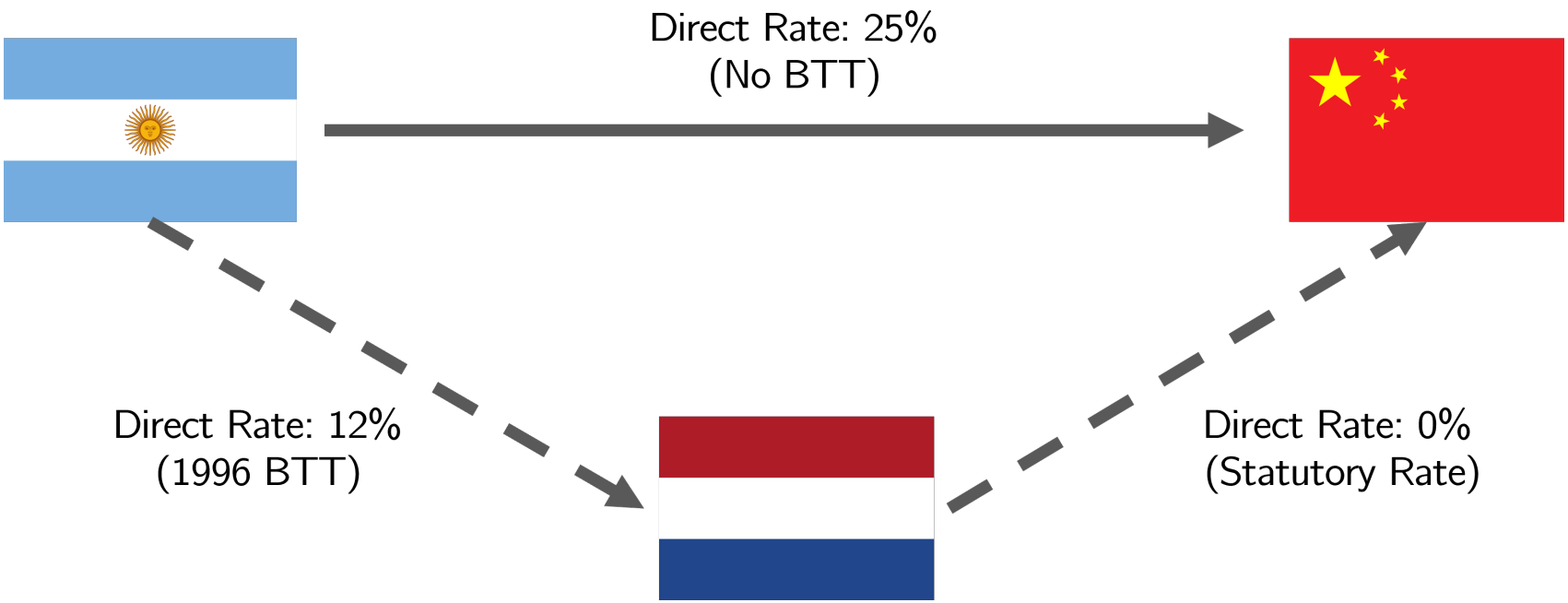

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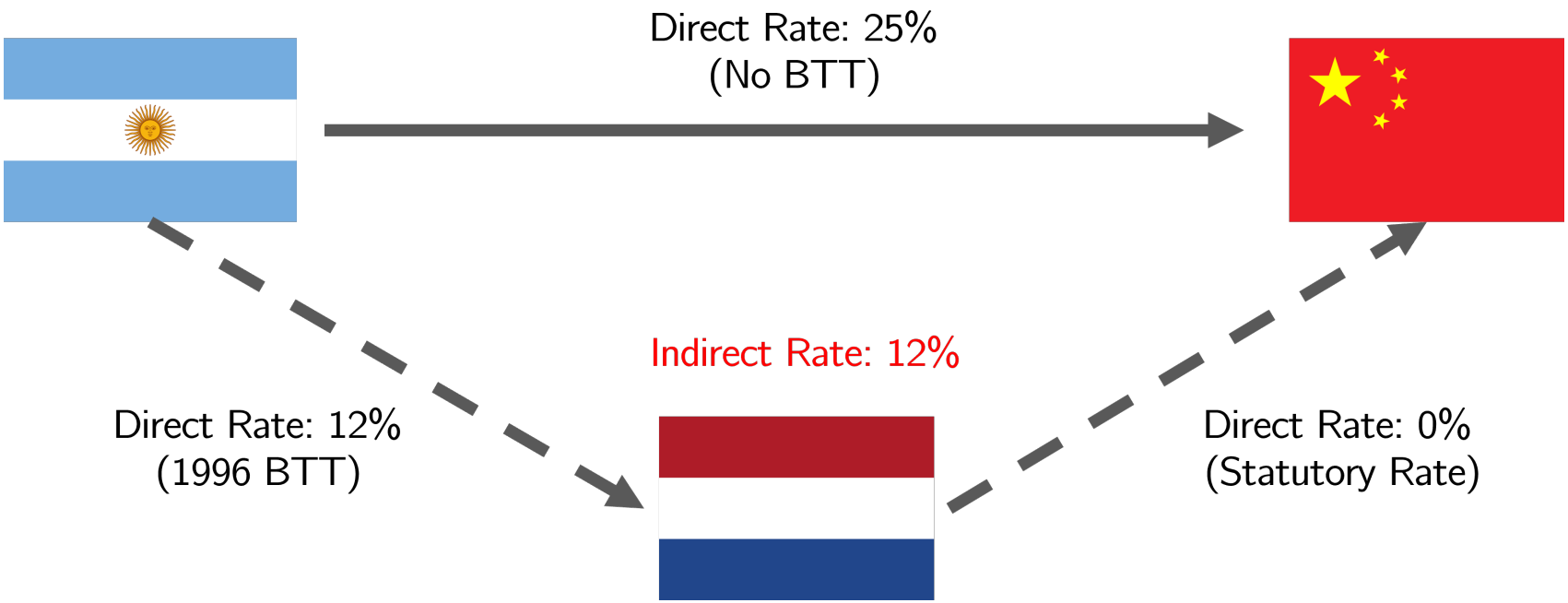
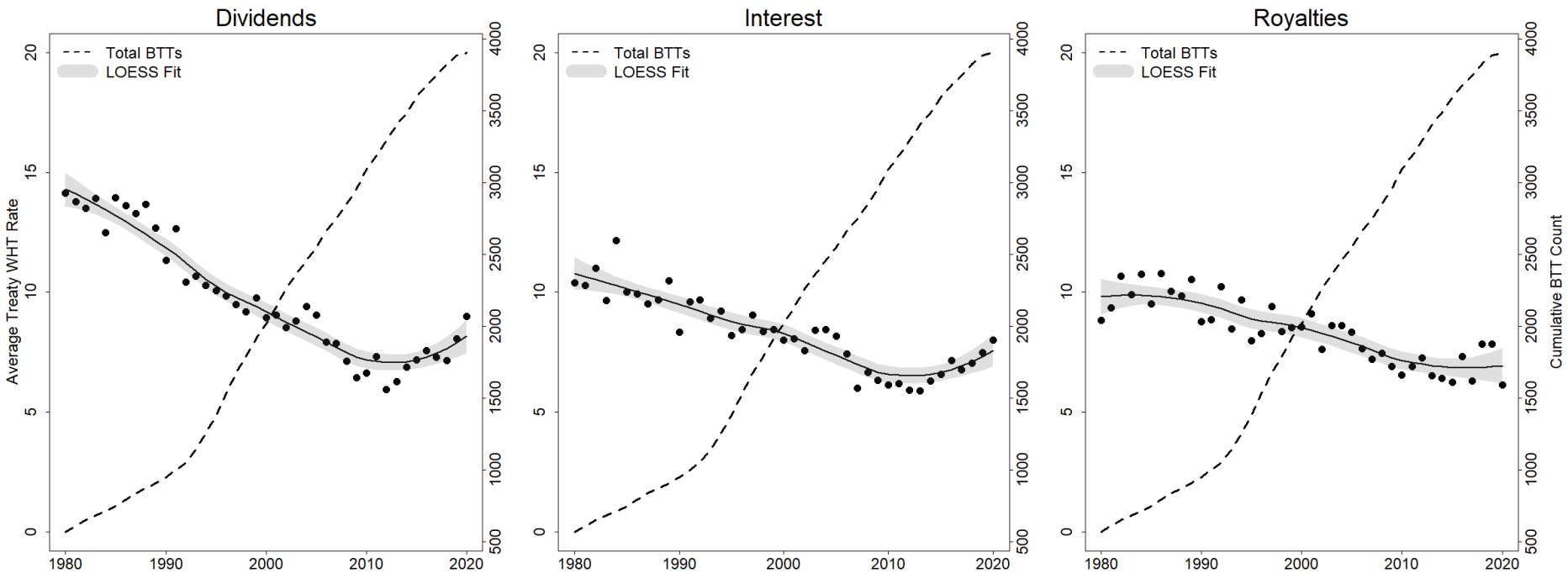


What Drives BTT Expansion?

Figure: As BTT ↑, Treaty WHT Rate ↓ (2004-2020)



Notes: This figure plots the total number of BTTs countries have signed (right axis) and average withholding tax rate specified in treaties signed in a certain year (left axis) for dividends, interest, and royalties. The solid line and the shaded area represent the locally estimated scatterplot smoothing (LOESS) estimates and corresponding 95% confidence intervals for the average withholding tax rates.

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Operationalization: $\text{Risk}_{ij} = \mathbb{1}\{t_{ij} > t_{ik^*j}\}$

- $k*$ is the optimal conduit
- $t_{ik^*j} = \min_{k \notin \{i,j\}} t_{ikj}$

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- 170+ jurisdictions; 1980 - 2020 ▸ coverage ▸ missingness

H1: Treaty Shopping ⇒ BTT Formation

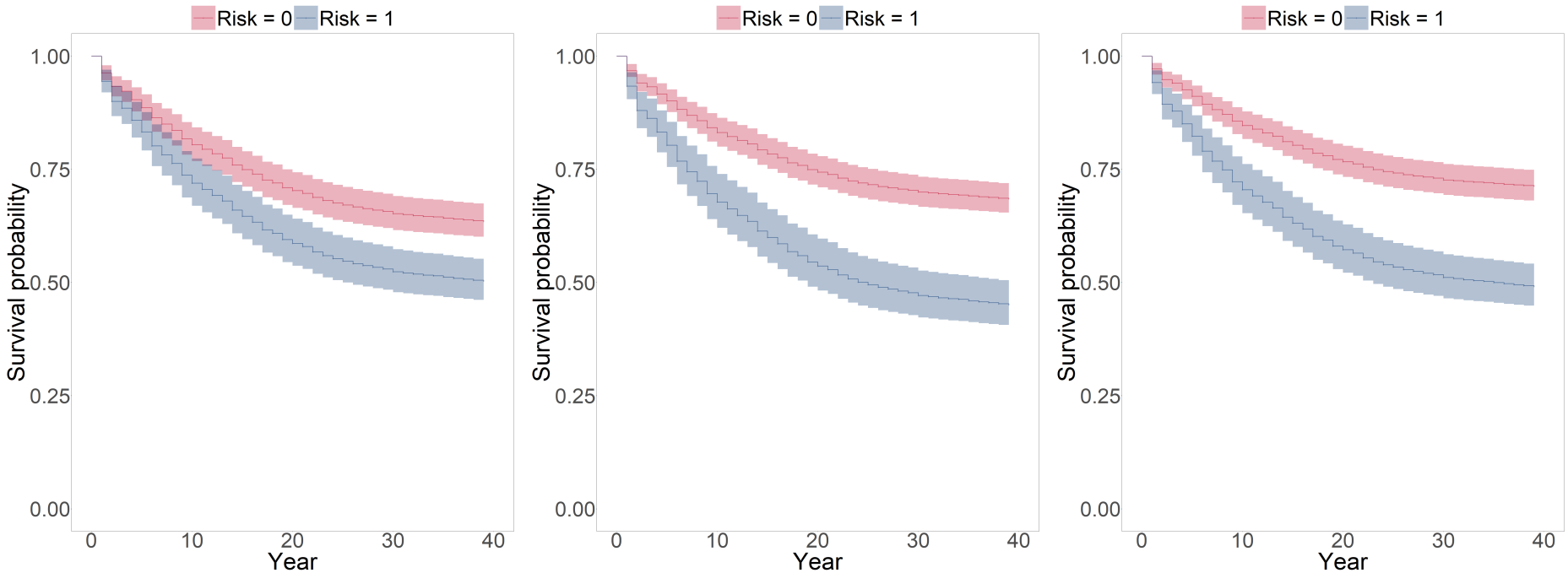
Table: Risk of Treaty Shopping and Treaty Formation

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (t-1)	0.149***	0.352***	0.420***
	(0.052)	(0.051)	(0.057)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	158684	158684	158684
BTTs covered	1119	1119	1119

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

H1: Treaty Shopping ⇒ BTT Formation

Figure: Survival Probability by Risk of Treaty Shopping



(a) Dividends (b) Interest (c) Royalties

Notes: This plot shows the predicted survival probability (probability of not signing a BTT) and corresponding 95% confidence interval, depending on whether the host country is facing the risk of treaty shopping. The x-axis represents the year relative to the start of the sample in 1980.Control variables are set at the group average (regional fixed effects are excluded).

H1: Treaty Shopping ⇒ BTT Formation

Robustness

- Undirected dyad
  - Added risk
  - Factorial risk
- Combined risk
- Potential gain
- Dyad product

Heterogeneity

- State capacity
- Potential conduits

Competing explanation

- Spatial dependence

H2: Treaty Shopping ⇒ Lower Treaty WHT Rate

Table: Risk of Treaty Shopping and Treaty Depth

	Tax Treaty Depth		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (t-1)	7.765***	5.708***	3.693***
	(1.472)	(1.058)	(1.074)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host country FE	✓	✓	✓
Partner country FE	✓	✓	✓
Year FE	✓	✓	✓
Observations	2162	2139	2161
Adjusted R^2	0.789	0.784	0.789

Notes: Directed-dyad level observations for 1980 - 2020. Only includes observations for the dyad-year that a bilateral tax treaty is signed. Results from ordinary least squares regression. Robust standard errors clustered at host country level reported in parentheses. All models include host country, home country, and year fixed effects. The dependant variable is the difference between the statutory withholding tax rate and the newly-signed treaty withholding tax rate for the given type of transaction. All covariates, except for time-invariant ones, are lagged by one year.
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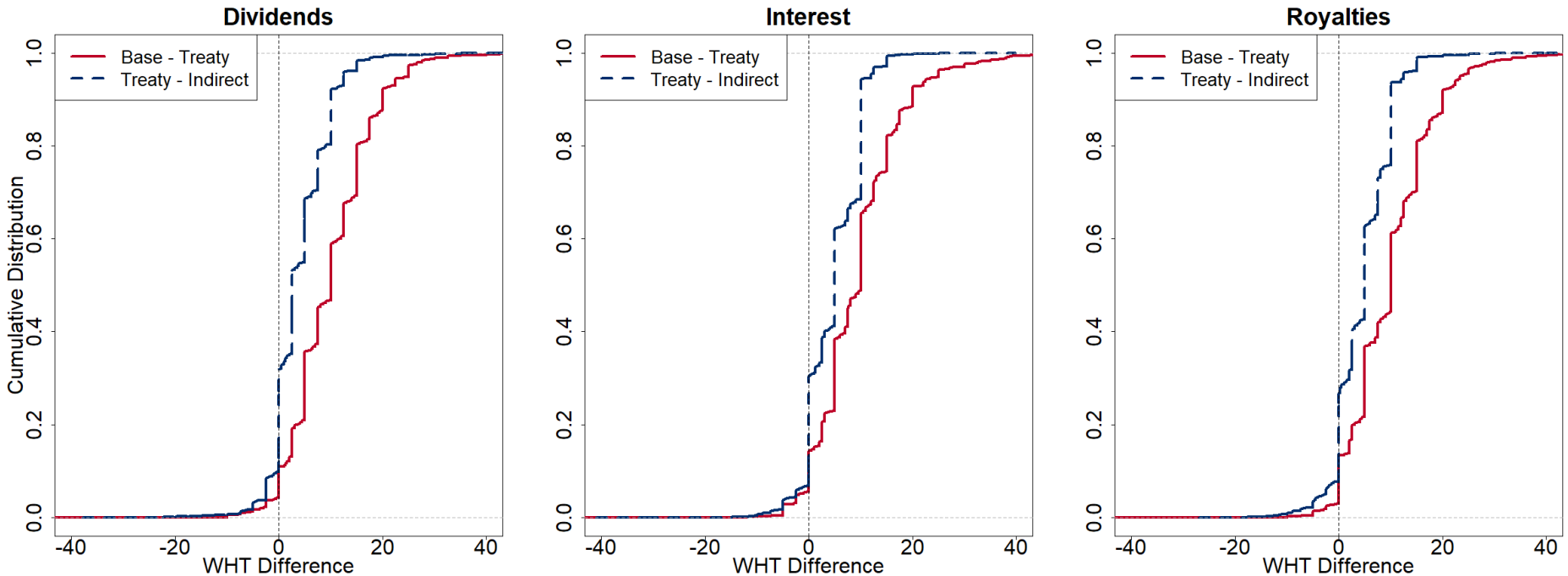
H2: Treaty WHT Rate Follows the Cheapest Indirect Rate

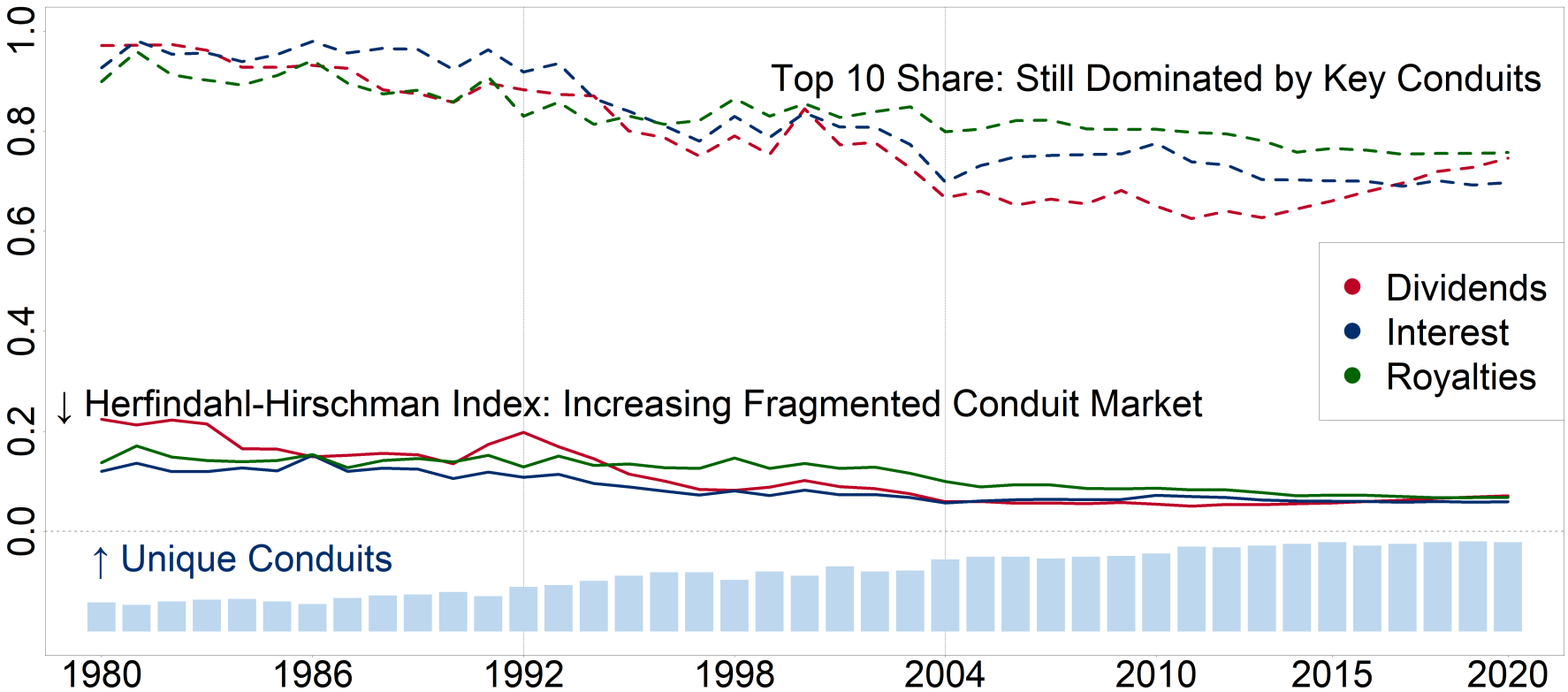
Figure: Comparison of Treaty WHT Rates with Base and Indirect Rates



Notes: This figure plots the empirical cumulative distribution function (CDF) for the difference between 1) the statutory withholding tax rate and the treaty withholding tax rate; and 2) the treaty withholding tax rate and the cheapest indirect rate. The statutory withholding tax rate and the cheapest indirect rate are measured at the year before BTT signing. The sample is directed-dyad observations at the year of BTT formation and only includes dyads that the host country faces the risk of treaty shopping in the year before.

H3: Emergence of New Conduit Countries

Figure: Treaty Shopping Conduits: Fragmented but Dominated by Key Countries



Notes: This figure depicts the evolution of the treaty shopping "conduit market" from 1980 to 2020, with solid lines representing the market concentration level measured by the Herfindahl-Hirschman Index and dashed lines indicating the total share of the top 10 conduit countries. The colors correspond to different payment types. The dashed vertical lines represent two important years: the year of 1992 when the BTT network began to expand rapidly, and the year of 2004 that the sample coverage has increased due to the switch of data sources. The histogram indicates the rising trend of the number of unique conduits over the same period.

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Treaty-shopping as unique (tax) policy constraints

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Globalization and state policy autonomy

- "Still room to move"? (Mosley 2000, 2005)

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Globalization and state policy autonomy

- "Still room to move"? (Mosley 2000, 2005)
- Policy divergence requires international cooperation convergence

Thank you!

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Appendix: Table of Contents

A. Data Description

- BTT data sources
- Base WHT data examples
- Imputation of Base WHT
- Coverage
- Missingness

B. Robustness

- Undirected dyad
- Combined risk
- Potential gain
- Dyad product

C. Heterogeneity

- State capacity (GDP pc)
- Number of conduits

D. Competing explanation

Sources for Treaty Withholding Tax Rates

Table: Percentage of Data Sources for Treaty Withholding Tax Rates

Source	**Percentage**
Original Treaty Documents	33.82%
Tax Treaties Explorer & IBFD WHT Table	21.71%
Tax Treaties Explorer	21.61%
IBFD WHT Table	16.21%
Other Sources	3.76%
Not Found	2.89%

Note: "IBFD WHT Table" refers to the IBFD Treaty Withholding Rates Table. "Other Sources" including tax summary reports by accounting firms, imputation from amending protocols, etc.

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Base WHT Data Example – PwC

Figure: Example – PwC WCTS 1993 – Malaysia

Recipient	Dividends (1) %	Interest (2) %	Royalties and certain rentals (3) %
Resident corporations	Nil	Nil	Nil
Resident individuals	Nil	Nil or 5	Nil
Nonresident corporations and individuals:			
Nontreaty	Nil	Nil or 20	15

▸ Data ▸ TOC

Base WHT Data Example – EY

Figure: Example – EY WCTG 2014 – Myanmar

A. At a glance

Corporate Income Tax Rate (%)	25
Capital Gains Tax Rate (%)	10/40 (a)
Branch Tax Rate (%)	35
Withholding Tax (%)	
Dividends	0
Interest	15 (b)(c)
Royalties from Patents, Know-how, etc.	20 (b)(d)

(a) Section: At a glance

F. Treaty withholding tax rates

The rates in the following table reflect the lower of the treaty rate and the rate under domestic tax law.

	Dividends %	Interest %	Royalties %
India	0	15 (a)(b)	20 (f)
Korea (South)	0	15 (a)(b)	20 (g)(h)
Laos	0	15 (a)(b)	20 (f)
Malaysia	0	15 (a)(b)	20 (f)
Singapore	0	15 (a)(c)	20 (g)(h)
Thailand	0	15 (a)(b)	20 (h)(i)(j)
United Kingdom	0	15 (d)	20 (e)
Vietnam	0	15 (a)(b)	20 (f)
Non-treaty countries	0	15	20

(b) Section: Treaty withholding tax

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Imputation of Missing Base WHT Rates

Table: Withholding Tax Rate on Royalties in Mexico

Jurisdiction	Year	Rate	Missing	Imputed
Mexico	1997	15 or 35		
Mexico	1998		Yes	No
Mexico	1999	15 or 40		
Mexico	2000	15 or 40	Yes	Yes
Mexico	2001	15 or 40		

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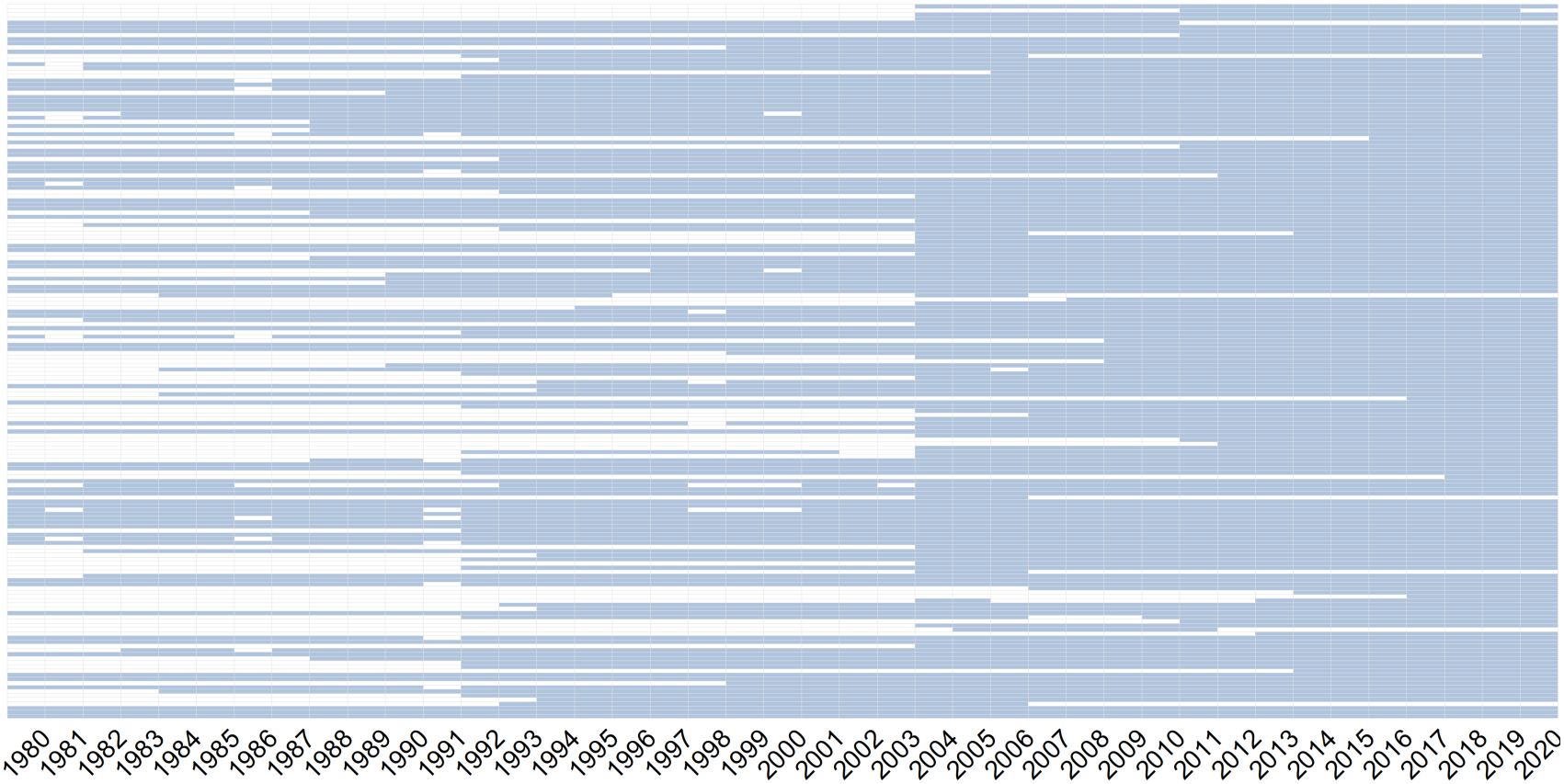
Sample Coverage of Base WHT Rates

Figure: Sample Coverage of Statutory Withholding Tax Rates

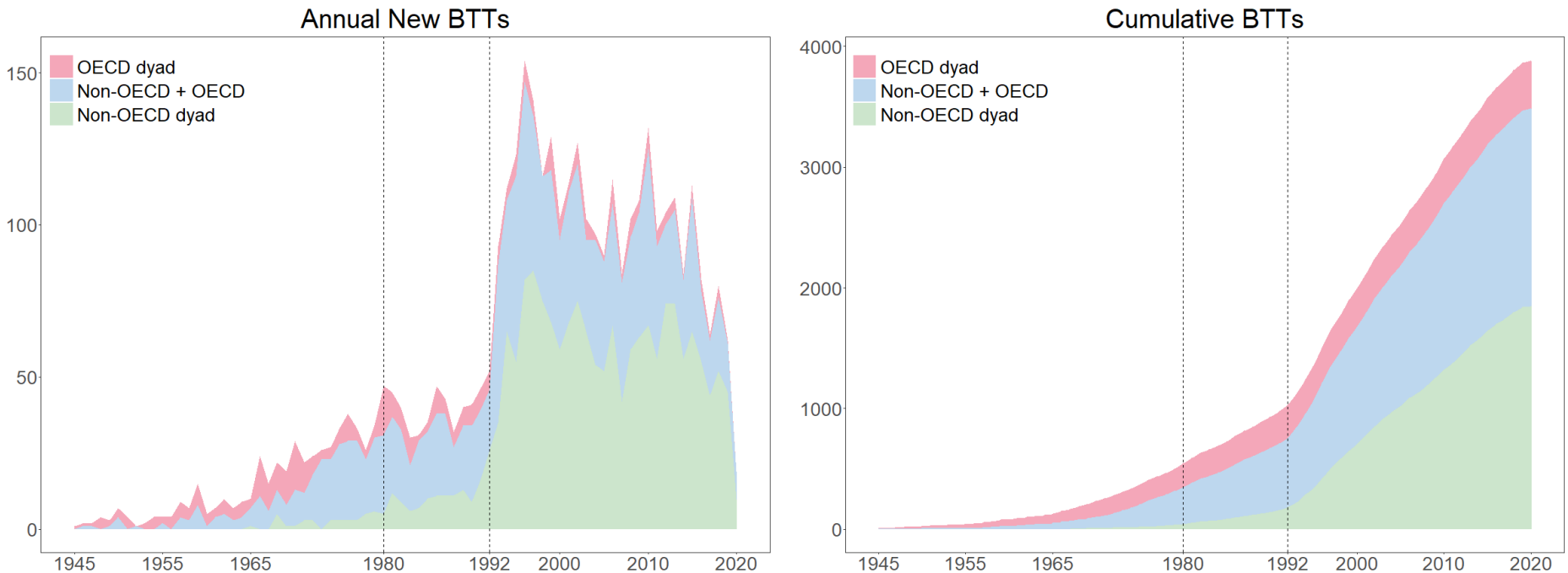


Notes: This figure displays the extent of coverage of the original dataset on statutory withholding tax rates for the period of 1980 to 2020. Rows represent each jurisdiction in the sample, and columns represent the years. Blue cells indicate the availability of data, while white cells indicate missing data.

▸ Data ▸ TOC

The Expansion of the Bilateral Tax Treaties

Figure: Annual New and Cumulative BTTs by OECD Status (1945 - 2020)



Notes: This figure displays the annual new BTTs (left panel) and cumulative BTTs (right panel) signed by jurisdictions between 1945 and 2020, depending on whether either or both the contracting states are OECD members. For consistency, OECD members only includes the 24 countries that joined in the 1960s and 1970s.

▸ Data ▸ TOC

Undirected Dyads: Added Risk

Table: Undirected Dyad and Risk of Treaty Shopping (Added)

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (Added, t-1)	0.177***	0.369***	0.438***
	(0.054)	(0.053)	(0.058)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	75302	75302	75302
BTTs covered	525	525	525

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

▸ Result ▸ TOC

Undirected Dyads: Factorial Risk

Table: Undirected Dyad and Risk of Treaty Shopping (Factor)

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (One-way, t-1)	0.065	0.564***	1.159***
	(0.095)	(0.113)	(0.179)
Risk of Treaty Shopping (Two-way, t-1)	0.317***	0.839***	1.409***
	(0.110)	(0.121)	(0.181)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	75302	75302	75302
BTTs covered	525	525	525

Notes: Undirected dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

▸ Result ▸ TOC

Combined Risk of Treaty Shopping

Table: Combined Risk Across Types

	Tax Treaty Added	Formation Indicator
Combined Risk of Treaty Shopping (t-1)	0.194***	0.515***
	(0.024)	(0.073)
Host country controls	✓	✓
Partner country controls	✓	✓
Dyad controls	✓	✓
Cumulative BTTs	✓	✓
Host region FE	✓	✓
Partner region FE	✓	✓
Observations	158684	158684
BTTs covered	1119	1119

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

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Potential Gain of Treaty Shopping

Table: Potential Gain of Treaty Shopping and Treaty Formation

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Gain of Treaty Shopping	0.004	0.008***	0.012***
	(0.003)	(0.003)	(0.002)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	158684	158684	158684
BTTs covered	1119	1119	1119

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

Use Product of Country-Level Controls

Table: Use Product of Country-Level Controls

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (t-1)	0.122**	0.333***	0.406***
	(0.050)	(0.050)	(0.056)
Host-Partner country controls (product)	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	158684	158684	158684
BTTs covered	1119	1119	1119

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

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Heterogeneity: The Role of State Capacity

Table: Treaty Shopping and BTT Formation: The Role of State Capacity

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (t-1)	2.250***	1.722***	1.623***
	(0.329)	(0.335)	(0.368)
GDP pc (log)	0.176***	0.160***	0.148***
	(0.041)	(0.043)	(0.044)
Risk x GDP pc	-0.238***	-0.150***	-0.130***
	(0.037)	(0.036)	(0.039)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	158684	158684	158684
BTTs covered	1119	1119	1119

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.

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Heterogeneity: Number of Potential Conduits

Table: Treaty Shopping and BTT Formation: Number of Potential Conduits

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Number of Candidate Conduits (log, t-1)	0.053	0.166***	0.227***
	(0.041)	(0.029)	(0.037)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	158684	158684	158684
BTTs covered	1119	1119	1119

Notes: Directed dyad-year level observations for 1980 - 2020. Results from Cox-Proportional Hazards Model with coefficients displayed. Efron approximation used for tied events. The event of interest is the formation of bilateral tax treaties between country dyads. Robust standard errors clustered on country dyads are reported in parantheses. All covariates, except for time-invariant ones, are lagged by one year.
$***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

▸ Result ▸ TOC

Competing Explanation: Spatial Dependence

Table: Replication of Barthel and Neumayer (2012)

	Tax Treaty Formation		
	Dividends	Interest	Royalties
Risk of Treaty Shopping (One-way, t-1)	0.299***	0.062	0.457***
	(0.075)	(0.076)	(0.087)
Contagion: Common Region	1.629***	1.674***	1.479***
	(0.352)	(0.357)	(0.352)
Contagion: Export Market Similarity	-5.830	-2.780	-6.304
	(7.528)	(7.592)	(7.584)
Contagion: Export Product Similarity	14.462***	15.023***	15.532***
	(4.595)	(4.615)	(4.650)
Host country controls	✓	✓	✓
Partner country controls	✓	✓	✓
Dyad controls	✓	✓	✓
Cumulative BTTs	✓	✓	✓
Host region FE	✓	✓	✓
Partner region FE	✓	✓	✓
Observations	49844	49844	49844
BTTs covered	267	267	267

Notes: Undirected-dyad level observations for 1980 - 2005. Results using the replication dataset of Barthel and Neumayer (2012), following the model specification they presented in Table 3 (page 653), with all covariates included. We introduce into this model our variable `Risk of Treaty Shopping`. Robust standard errors clustered on country dyads. Breslow approximation for tied events. All covariates, except for time-invariant ones, are lagged by one year. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

▸ Result

▸ TOC