



EXCHANGE OF INFORMATION AND BANK DEPOSITS IN INTERNATIONAL FINANCIAL CENTRES

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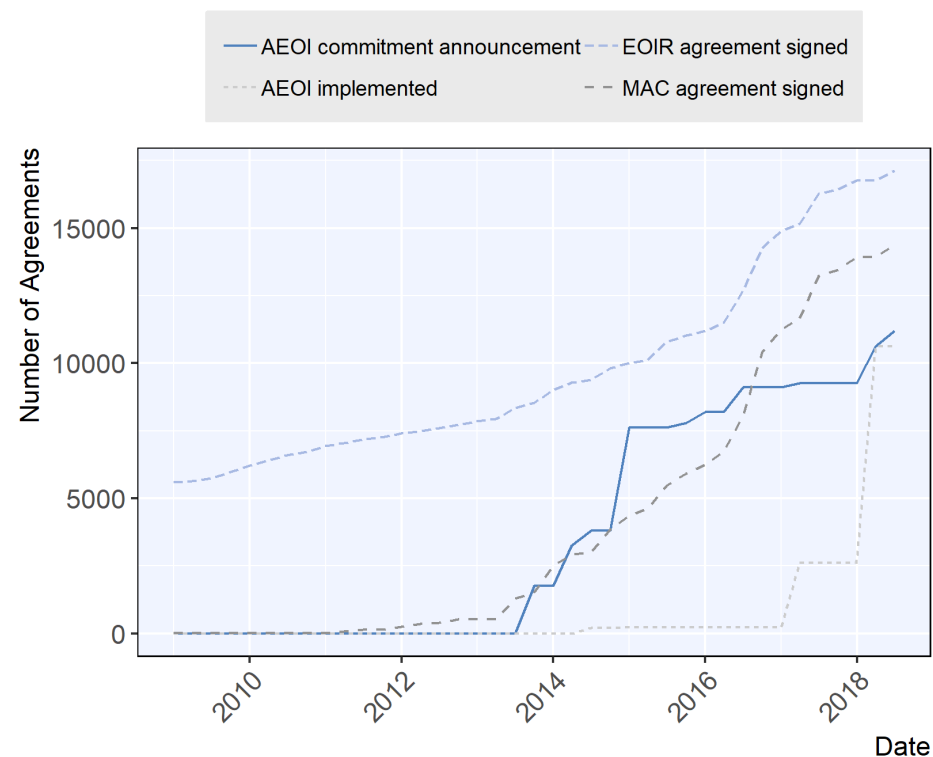
1. MOTIVATION & LITERATURE

MOTIVATION FOR EXCHANGE OF INFORMATION (EOI) IMPACT ASSESSMENT

- In 2009, the G20 declared that **‘the era of bank secrecy is over’** (G20 Leaders Statement)
- To increase global tax transparency, the OECD implemented exchange of information mechanisms:
 - Exchange of Information on Request (EOIR)
 - Automatic Exchange of Information (AEOI)
- This ongoing exchange of information requires **an assessment of its effectiveness to ensure continued momentum behind global efforts in increasing tax transparency**
- Importance for financial stability: impact on jurisdiction business models; disclosure of illegal activities affecting individual banks (e.g. Danske Bank scandal)
- Key policy issue: tax evasion generates revenue losses

What is EOI?

- To increase global tax transparency, the OECD implemented two important exchange of information mechanisms:
 - Exchange of Information on Request (EOIR) since 2009; information exchanged if “foreseeably relevant”
 - Automatic Exchange of Information (AEOI), with commitments by Global Forum member countries in 2014 to engage in automatic exchange of information under the Common Reporting Standards (CRS); first exchanges started in 2017
- Information covered consists of different kinds of investment income (such as interest and dividends), sales proceeds of assets or information on account balances
- To date, more than 4500 information agreements are in force with 90 jurisdictions implementing the CRS
- 47 million offshore accounts with a total value of EUR 4.9 trillion have been exchanged for the first time, resulting in over EUR 95 billion in additional revenue (tax, interest, penalties)



- The network of EOI agreements has steadily expanded since 2012
- A broad EOI network means fewer places to hide assets
- A key means of EOI expansion has been MAC signature
- MAC-based EOI is a large share of all EOI relationships since 2012, especially for IFCs
- As far as we are aware, no existing study has included EOI based on MAC into analysis of bank deposits



EXISTING RESEARCH ON EOI AND KEY CONTRIBUTIONS

Existing research:

1. Bank liabilities (Johannesen & Zucman, 2014; Cusi et al., 2018; Menkhoff & Miethe, 2019; Beer et. al., forthcoming)
2. Portfolio investment (Zucman, 2013; Hanlon et. al. 2015; Pellegrini et al., 2017; Heckemeyer & Hemmerich, 2018)
3. FDI (Blonigen et al., 2013)

Key contributions: high quality and unique data, sophisticated analysis

1. Expands the work of Johannesen and Zucman (2014) by employing a larger sample in terms of time coverage (→ more years, more EOI – fewer places for money to hide)
2. Uses a unique restricted database allowing to increase country coverage. Access to more bilateral relationships than before in the literature.
3. Adds sophistication to the previous literature by distinguishing the impacts of announcements, EOI signatures and EOI commencement of the exchanges. Also accounts for the impact of the rapid expansion in EOI networks.



EXISTING RESEARCH ON BANK DEPOSITS AND EXCHANGE OF INFORMATION

■ Several studies have examined the impact of EOI on bank deposits in IFCs using BIS data:

• Johannesen & Zucman (2014):

- Sample length: 2003:IV – 2011:II
- IFCs: Austria, Belgium, Cayman Islands, Chile, Cyprus, Guernsey, Isle of Man, Jersey, Luxembourg, Macao, Malaysia, Panama, Switzerland

• Casi, Spengel & Stage (2018):

- Sample length: 2014:IV – 2017:III
- IFCs: Guernsey, Hong Kong, Isle of Man, Jersey, Macao, (USA)

• Ahrends & Bothner (2019):

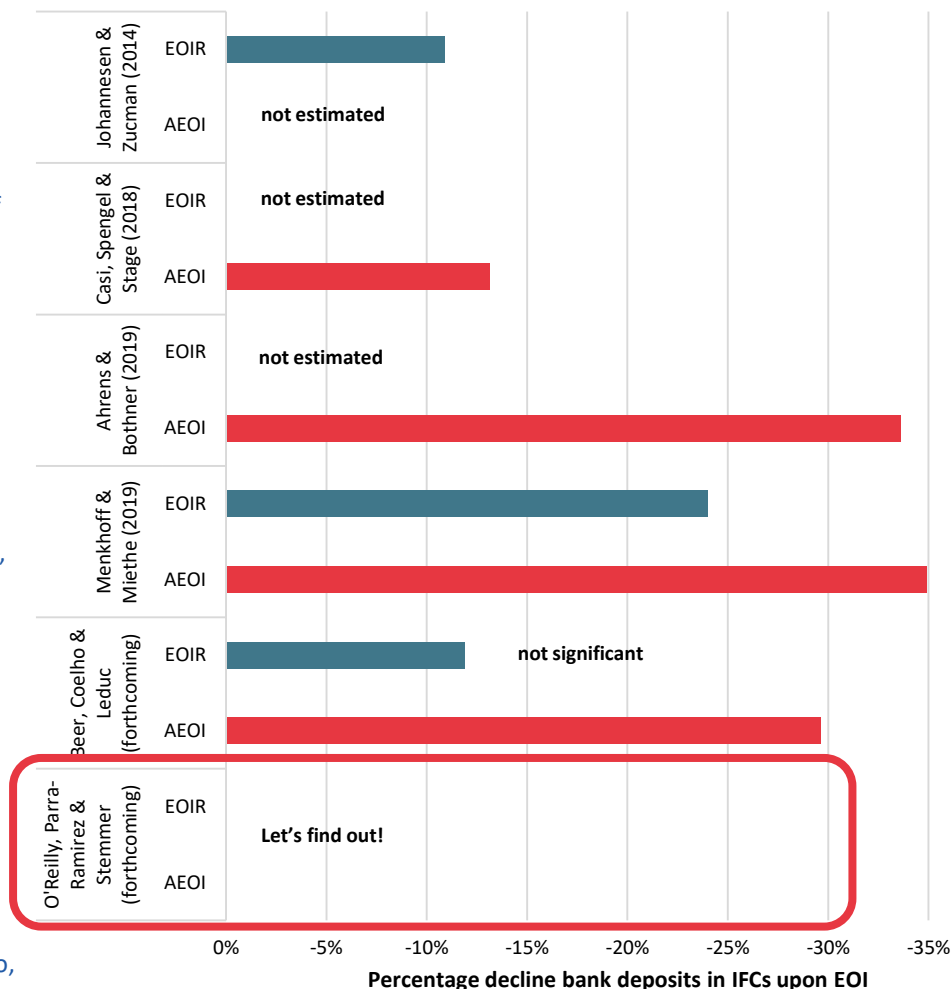
- Sample length: 2009:I – 2017:IV
- IFCs: Austria, Belgium, Chile, Guernsey, Hong Kong, Isle of Man, Jersey, Luxembourg, Macao, Switzerland

• Menkhoff & Miethe (2019):

- Sample length: 2003:I – 2017:IV
- IFCs: Belgium, Chile, Guernsey, Ireland, Isle of Man, Jersey, Luxembourg, Switzerland

• Beer, Coelho & Leduc (forthcoming):

- Sample length: 1995:I – 2018:II
- IFCs: Austria, Bahamas, Bahrain, Belgium, Bermuda, Chile, Curacao, Cyprus, Guernsey, Hong Kong, Isle of Man, Jersey, Luxembourg, Macao, Panama, Singapore, Switzerland





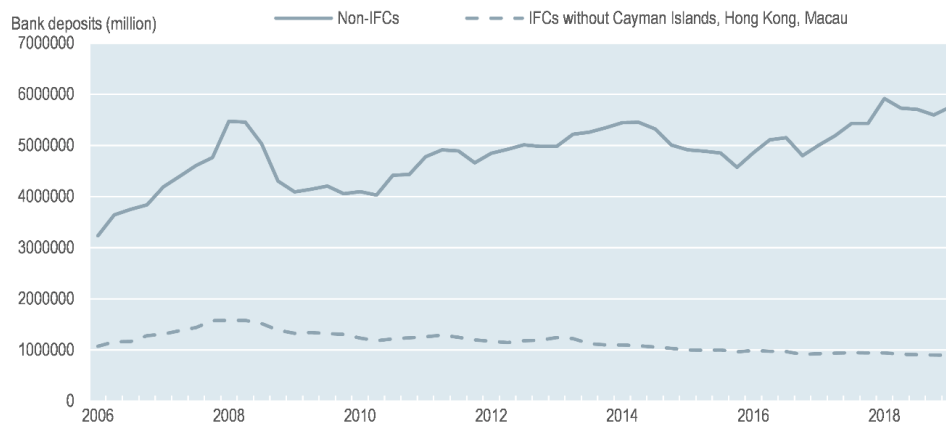
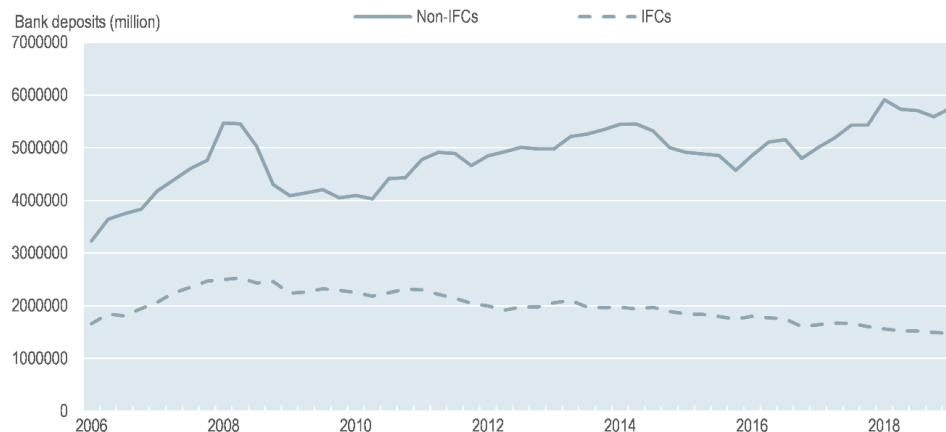
2. DATA

HIGH QUALITY AND UNIQUE DATA ON BANK DEPOSITS

- **Key dependent variable - cross-border bank deposits** held in an IFC by a non-bank counterparty
 - Locational Banking Statistics (LBS) from the Bank for International Settlements
 - Bank to bank deposits excluded
 - Non-banks include households, corporates, general government and the non-bank financial sector
- **Bank deposits are a key variable covered by AEOI, very liquid and of high data quality** (available from Q1 2006 – Q1 2019)
- **29 countries disclose bilateral counterparty country data in a file made public by the BIS:**
 - Detailed list of countries in paper
- **Access to 14 further jurisdictions through collaboration with Banque de France:**
 - Analysis covers most international financial centres: a more comprehensive accounting of IFCs than the existing literature

ANALYSIS OF GLOBAL BANK DEPOSITS

Evolution of bank deposits in IFCs and Non-IFCs



Without Cayman Islands:

- Deposits in IFCs peaked at USD 1.7 trillion in Q1 of 2008
- Substantial fall since then by USD 410 billion or 24% by Q1 2019
- Strong reduction came in the immediate aftermath of the financial crisis with an 13% fall between Q2 2008 and Q2 2011
- Decrease has continued since then by a further 11%



3. ANALYSIS & RESULTS



REGRESSION SPECIFICATION

- Similar approach to Johannesen & Zucman (2014). **Regress EOI signatures on an unbalanced panel of cross-border bank deposits** to test the key hypothesis:

An EOI agreement between a given IFC and a given non-IFC should be associated with a reduction in bank deposits held in that IFC by residents of the non-IFC.

- This hypothesis could be tested using the following regression equation

$$\log(\text{Deposits}_{ijq}) = \alpha + \beta \text{EOI}_{ijq} + \gamma_{ij} + \theta_q + \epsilon_{ijq}$$

- EOI_{ijq} : Existence of an EOI agreement between countries i and j in quarter q
 - EOIR signature (incl. MAC),
 - Announcement to AEOI commitment,
 - AEOI commencement (with or without FATCA)
- **Country-pair and year-quarter fixed effects included**, with standard errors robust to linear correlation at the country-pair level

MAIN REGRESSION RESULTS

Impact of EOI variables on bank deposits in 16 IFCs owned by Non-IFCs

	EOIR only	EOIR and AEOI Announcement	EOIR and AEOI (incl. FATCA) Commencement	EOIR and AEOI (incl. FATCA) Announcement and Commencement	EOIR and AEOI Announcement and Commencement
EOIR Signature	-0.024 (0.044)	-0.028 (0.044)	-0.041 (0.045)	-0.042 (0.045)	-0.043 (0.044)
AEOI Announcement		-0.074 (0.066)		-0.041 (0.064)	-0.033 (0.064)
AEOI Commencement					-0.249*** (0.062)
AEOI (incl. FATCA) Commencement			-0.199*** (0.068)	-0.185*** (0.062)	
Observations	29.461	29.461	29.461	29.461	29.461
R ²	0.0001	0.0005	0.002	0.002	0.003
Jurisdiction-Pair Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes

* Note: R² does not include the explanatory power of the country-pair or time fixed effects, which drive much of the variation in the data

CHANGING IMPACT OF EOIR OVER TIME

Impact of the EOIR signature variable for different sub-sample lengths

- Johannesen & Zucman (2014) find significant reductions in IFC deposits of 11% upon EOIR signature in a pre-2012 sample

	EOIR only	Johannesen & Zucman (2014) sample time: 2003 Q4 – 2012 Q4	Johannesen & Zucman (2014) sample time: 2003 Q4 – 2013 Q4	Johannesen & Zucman (2014) sample time: 2003 Q4 – 2014 Q4
EOIR Signature	-0.024 (0.044)	-0.106* (0.055)	-0.095* (0.051)	-0.093* (0.049)
Observations	29.461	18.585	21.065	23.834
R ²	0.0001	0.002	0.001	0.001
Jurisdiction-Pair Fixed Effects	Yes	Yes	Yes	Yes
Year-Quarter Fixed Effects	Yes	Yes	Yes	Yes

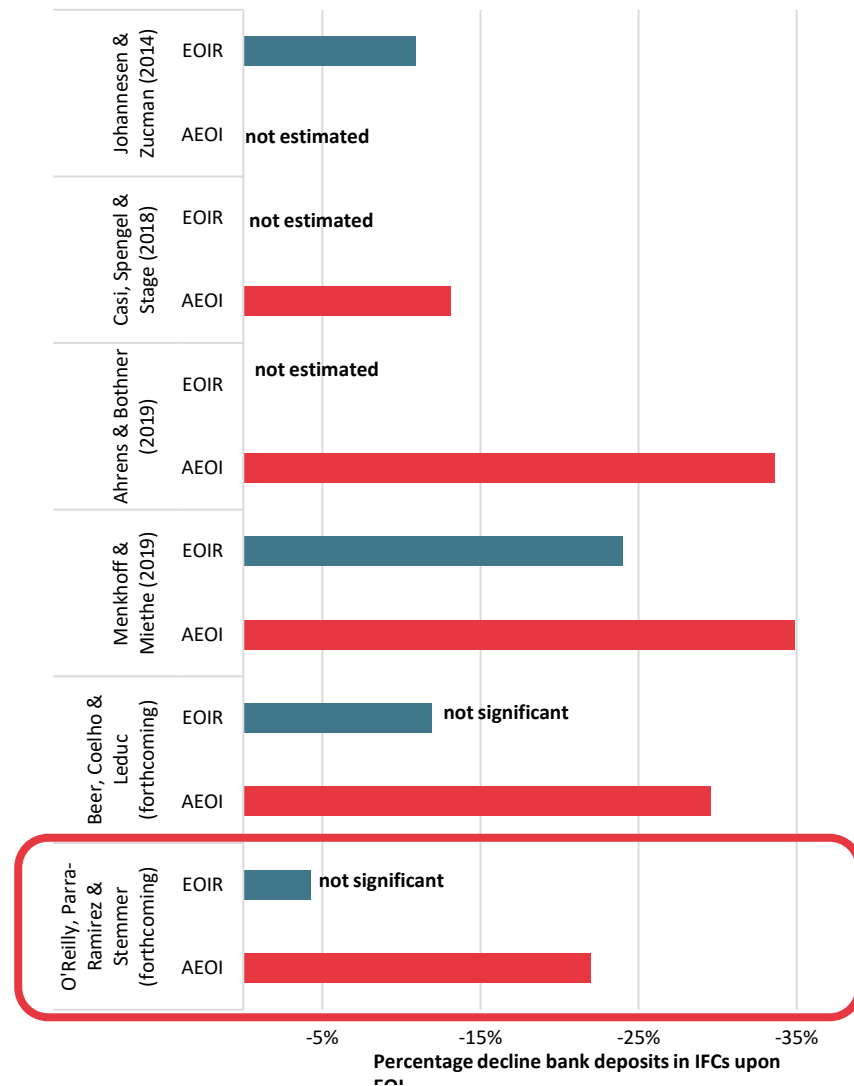
* Note: R² does not include the explanatory power of the country-pair or time fixed effects, which drive much of the variation in the data

- Our results do not find significant effect of EOIR – how to explain discrepancy? Test using differing sample lengths
- Result show decreasing effects of EOIR, suggesting that either the EOIR effect weakens over time
- MAC expansion potentially resulted in “less relevant” new EOIR relationships with the passing of time – reducing impact of additional relationships

RESULTS COMPARED TO EOIR & AEOI EFFECTS IN THE LITERATURE

■ Brief summary of regression results:

- AEOI commencement is associated with a 22% decrease in foreign-owned IFC deposits, ranging in the middle of estimates in the literature
- EOIR signatures show a muted significant impact until Q2 2014 and effects weaken over time – perhaps due to “less relevant” new bilateral EOIR relationships with expanded MAC network



MULTICOLLINEARITY ADDRESSED: DYNAMIC DIFFERENCE-IN-DIFFERENCES ESTIMATION

- We employ a dynamic Difference-in-Differences model similar to Johannesen (2014):

$$\log(\text{Deposits}_{ijq}) = \alpha + \beta_1 \gamma_{ij} + \beta_2 \theta_\tau + \beta_3 \theta_\tau * EA_{ij} + \epsilon_{ijq}$$

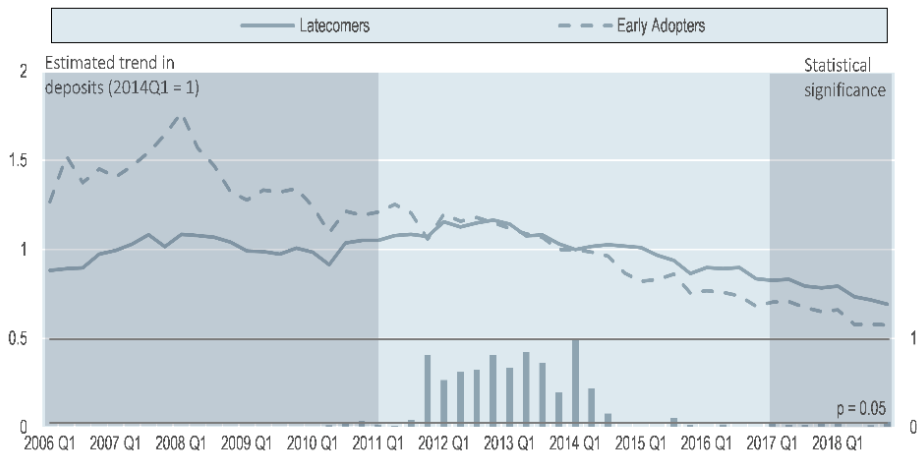
- **Estimation of time trends** in foreign deposits of the “Early Adopters” (our **treatment group** EA_{ij}) relative to the average time trend of all other jurisdictions (**control group** θ_τ) at every quarter
- Results are conditional on jurisdiction-pair and time fixed effects, i.e. we account for invariant country-pair factors (e.g. language) and common time trends (e.g. financial crises)
- **Treatment group:** country pairs that jointly announced the early adoption of AEOI in March 2014 → 2014 Q1 as reference quarter for regressions and scaled graphs
- **Control group:** all other country pairs
- **Sample:** deposits owned by non-IFCs in IFCs

- We employ the following sample pairs in the Difference-in-Differences estimation:

		IFCs	
		Early Adopters	Latecomers
Non-IFCs	Early Adopters		
	Latecomers		

- In March 2014, a joint statement was issued by the following Early Adopters to AEOI:
- Anguilla, Argentina, Belgium, **Bermuda**, British Virgin Islands, Bulgaria, **Cayman Islands**, Colombia, Croatia, **Cyprus**, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Gibraltar, Greece, **Guernsey**, Hungary, Iceland, **Isle of Man**, India, Ireland, Italy, **Jersey**, Latvia, Liechtenstein, Lithuania, Malta, Mexico, Montserrat, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Africa, Spain, Sweden, Turks & Caicos Islands, United Kingdom

MULTICOLLINEARITY ADDRESSED: DYNAMIC DIFFERENCE-IN-DIFFERENCES ESTIMATION



Note: Lines indicate trends in deposits as captured by coefficients on time dummies θ_τ and the interaction terms $\theta_\tau * EA_{ij}$, that is $\exp(\beta_2)$ for non-Early Adopters and $\exp(\beta_2 + \beta_3)$ for Early Adopters. Columns indicate statistical significance levels of interaction terms $\theta_\tau * EA_{ij}$.

- Results are based on the strict assumption that the treatment group only encounters deposit withdrawals upon early announcement → pre-treatment trend differentials should be rather small and insignificant
- Results show diverging trends between foreign-owned deposits in early-adopting country pairs and latecomers after the reference period 2014 Q1
- This is confirmed by the bars at the bottom, depicting statistical significance for the trend divergence of Early Adopters at the 5% levels
 - Trends significantly diverge with a slight lag after 2014 Q3
 - Statistical significant difference confirms Early Adopters faced deposit reductions post- AEOI announcement not faced by non-early-adopting IFCs
- **The estimated treatment effect on foreign deposits in the Early Adopters due to AEOI commitment amounts to about -11% on average between 2014 Q1 and 2015 Q1**



ROBUSTNESS CHECK #1: EFFECT ACROSS JURISDICTIONS PAIRS

- Negative impact of EOI changes on cross-border deposits appears confined to deposits from non-IFCs into IFCs
- Deposits between IFCs not affected
- Positive impact on deposits between non-IFCs

➔ Increasing shift in cross-border banking activity away from IFCs

	EOIR and AEOI (incl. FATCA) Announcement and Commencement	EOIR and AEOI Announcement and Commencement	EOIR and AEOI (incl. FATCA) Announcement and Commencement	EOIR and AEOI Announcement and Commencement
	Non-IFC from Non-IFC	Non-IFC from Non-IFC	IFC from IFC	IFC from IFC
EOIR Signature	-0.033	-0.034	-0.065	-0.065
	0.059	0.059	0.069	0.069
AEOI Announcement	0.272**	0.275**	-0.14	-0.14
	0.111	0.111	0.121	0.064
AEOI Commencement		-0.03		-0.133
		0.073		0.106
AEOI (incl. FATCA) Commencement	-0.014		-0.133	
	0.07		0.106	
R2	0.004	0.004	0.002	0.002
Num. obs.	23 860	23 860	15 645	15 645
Jurisdiction-pair FEs	Yes	Yes	Yes	Yes
Year-Quarter FEs	Yes	Yes	Yes	Yes

Note: The dependent variable is the stock of deposits held by savers of jurisdiction *i* in banks of either non-IFCs or IFC *j* at the end of quarter *q*. The unit of observation is the jurisdiction-pair (*i*, *j*) and the sample period goes from Q1 2006 to Q4 2018. Data are provided for non-bank counterparties only. Data are aggregated across currencies, sectors, reporting institutions, and instrument type. ***, **, and * represent statistical significance levels of 1%, 5% and 10% respectively.

Source: Authors' calculations based on LBS, BIS, and data on information exchange agreements provided by the Global Forum

ROBUSTNESS CHECK #2: EFFECT OF VOLUNTARY DISCLOSURE PROGRAMS

- The inclusion of a variable accounting for voluntary disclosure programmes validates the impact of AEOI on IFC deposits
- Sign of VDP:
 - Endogeneity?
 - Langenmayr (2017): effect on low risk-averse taxpayers
 - Johannesen et al. (2019): most disclosures happened outside of VDPs

	EOIR and AEOI (incl. FATCA) Announcement and Commencement	EOIR and AEOI Announcement and Commencement
	IFC from Non-IFC	IFC from Non-IFC
EOIR Signature	-0.043	-0.044
	0.044	0.044
AEOI Announcement	-0.51	-0.044
	0.064	0.064
AEOI Commencement		-0.230***
		0.062
AEOI (including FATCA) Commencement	-0.172***	
	0.061	
Voluntary Disclosure/ Amnesty	0.227***	0.219***
	0.064	0.064
R2	0.004	0.005
Num. obs.	29 461	29 461
Jurisdiction-pair FEs	Yes	Yes
Year-Quarter FEs	Yes	Yes

Note: The dependent variable is the stock of deposits held by savers of non-IFC jurisdiction i in banks of IFC j at the end of quarter q . The unit of observation is the jurisdiction-pair (i, j) and the sample period goes from Q1 2006 to Q4 2018. Data are provided for non-bank counterparties only. Data are aggregated across currencies, sectors, reporting institutions, and instrument type. ***, **, and * represent statistical significance levels of 1%, 5% and 10% respectively.

Source: Authors' calculations based on LBS, BIS, and data on information exchange agreements provided by the Global Forum

ROBUSTNESS CHECK #3: TESTING DIFFERENT DEFINITIONS OF IFCs

- Excluding one-by-one the IFCs that are BIS reporters to see if the impact of AEOI commencement is homogeneous across different samples
- The definition of IFCs affects the impact of AEOI commencement marginally**

Jurisdiction excluded	Coefficient for EOIR signature	Coefficient for AEOI commencement
Bahrain	-0.039	-0.254***
Bahamas	-0.029	-0.277***
Bermuda	-0.054	-0.240***
Cayman Islands	-0.034	-0.197***
Netherlands Antilles/Curaçao	-0.029	-0.256***
Cyprus	-0.035	-0.240***
Guernsey	-0.024	-0.267***
Hong Kong, China	-0.052	-0.256***
Isle of Man	-0.058	-0.281***
Jersey	-0.055	-0.292***
Luxembourg	-0.043	-0.276***
Macau, China	-0.047	-0.243***
Malaysia	-0.043	-0.266***
Panama	-0.047	-0.267***
Singapore	-0.043	-0.262***
Switzerland	-0.049	-0.277***

Note: The dependent variable is the stock of deposits held by savers of jurisdiction i in banks of IFC j at the end of quarter q .

Source: Authors' calculations based on BIS LBS, and data on information exchange agreements provided by the Global Forum.



4. CONCLUSION & ONGOING WORK

CONCLUSION AND ONGOING WORK

Summary of main results:

- Overall bank deposits in IFCs decreased by 24% since their peak in the second quarter of 2018, amounting to an equivalent of USD 410 billion
 - Finding validated through several new robustness checks
- AEOI commencement is associated with between 17-22% decrease in IFC deposits owned by non-IFC holders
- EOIR signatures only show a modestly significant impact (9 to 10%) under a reduced sample length, hinting at a weakening effect over time post-2012. This may be due to an increasingly global approach to tax transparency with an expanding MAC network.

Ongoing work:

- Using new and unique level of disaggregation that allows to distinguish non-bank counterparty sectors, ie households, corporates and general government.



Thank you!
Questions?