G20
SOUTH AFRICA 2025

Solidarity
Equality
Sustainability

South African Reserve Bank

Committee on Payments and Market Infrastructures | BIS

Send me money ASAP: Assessing the impact of Fast Payment Systems on the Cost of Remittances

Marco Brandi, **Alberto Di Iorio**, Andrea Nobili
Directorate General for Payments and Market Infrastructures
Bank of Italy

Advancing Cross-Border Payments: Opportunities and Challenges for Sub-Saharan Africa

South African Reserve Bank, Pretoria

22 Oct 2025

The views expressed in this presentation are those of the authors and do not necessarily reflect those of the Bank of Italy. Any remaining errors are the authors' own.

Background

Globalisation of trade, capital and migration increased the demand for cross-border payments

In 2020 the G20 endorsed the Roadmap for enhancing cross-border payments

Specific attention has been paid to the remittance segment:

- Cost up to 14% in some corridors according to WB
- Delays in fund transfer impact recipients
- Reduction in access due to bank de-risking

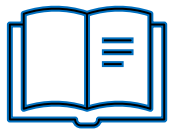
Focus on Fast Payment Systems as a tool to improve domestic and cross-border payments:

- Benefits to end-users (increased financial inclusion, less reliance on cash, additional financial services)
- Interlinking arrangement to expand domestic benefits to cross-border dimension

Committee on Payments and Market Infrastructures | BIS

South African Reserve Bank

Research question



The literature already found some benefits:

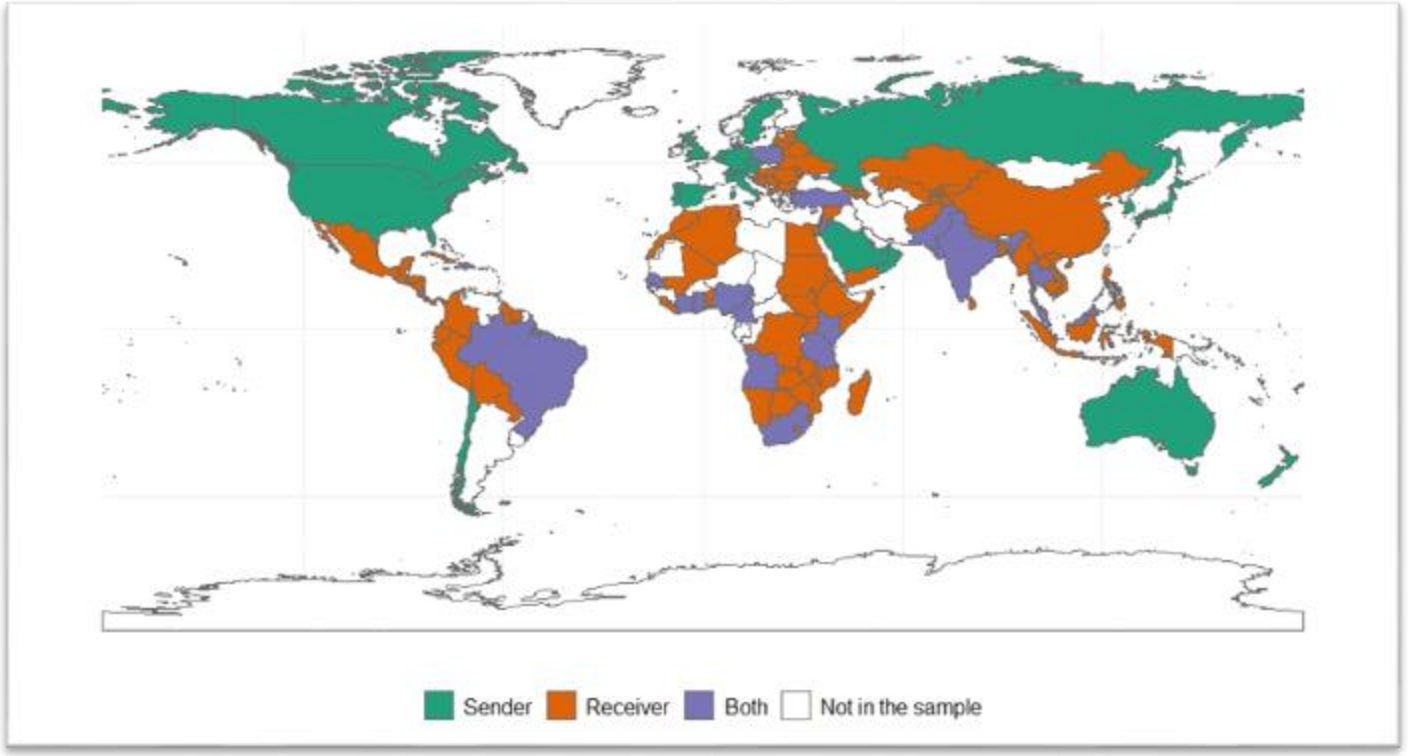
- FPS improve efficiency, transparency and competition in the market and can act as a catalyst for technological innovation
- FPS are associated with a reduction in cash usage and an increase in the number and frequency of small-value digital payments
- The adoption of FPS is associated with improvements in financial inclusion indicators

Does the implementation of an FPS in a jurisdiction have an impact on the cost of remittances received by that jurisdiction?

Data overview

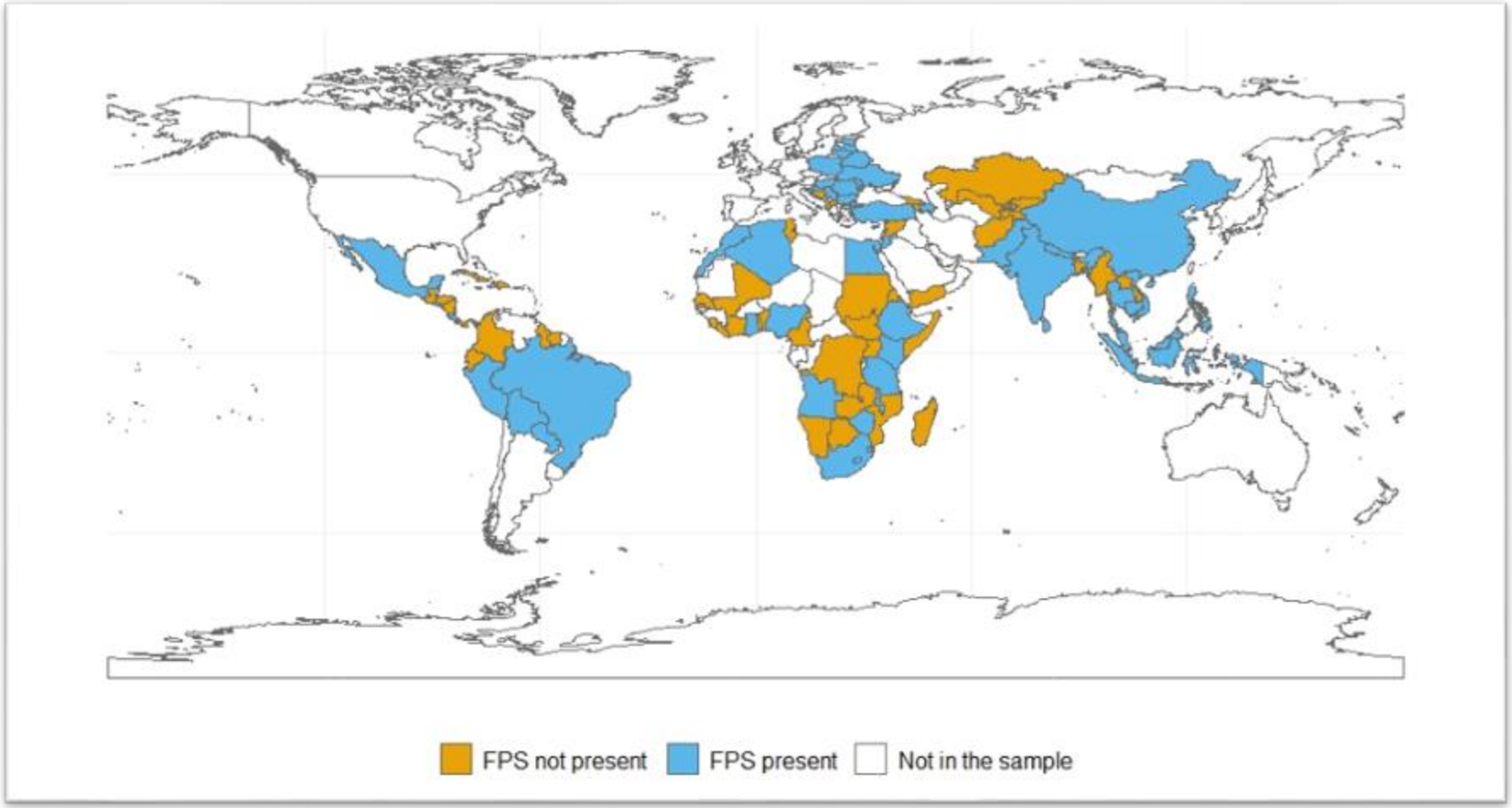
Remittance Prices Worldwide (RPW) by the World Bank:

- Quarterly, from Q2-2016 to Q3-2024
- Granularity at the firm level; info on speed, payment instrument etc
- Cost for $200 and $500 split into Fee and FX component
- 49 Sending and 105 receiving countries summing to 368 corridors worldwide



Data overview - 2

We complemented WB data with information on the presence of an FPS

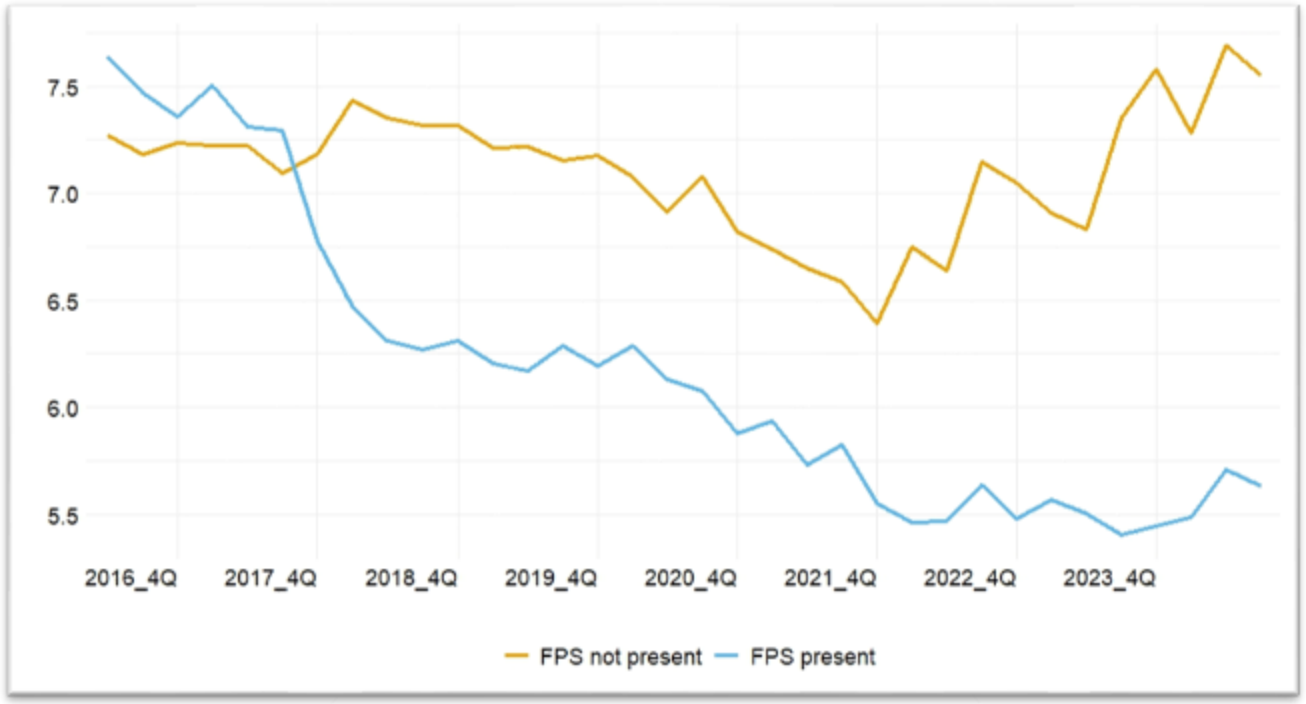


Descriptives

	Min	Mean	Max	Std. Dev.	N. Obs
Remittances Cost					
Payment 200 USD	-0.06	6.46	31.44	4.87	182825
Firm-Type					
Bank	-0.06	10.02	31.44	7.28	28810
Money Transfer Operator	-0.06	5.75	31.44	3.88	148190
Other	-0.02	6.72	30.86	4.92	5825
Region					
East Asia & Pacific	-0.06	6.67	31.31	4.99	46569
Europe & Central Asia	-0.06	6.21	31.33	4.62	24335
Latin America & Caribbean	-0.05	5.96	30.29	3.61	23114
Middle East & North Africa	-0.05	6.60	30.49	4.63	16612
South Asia	-0.06	5.00	31.44	4.33	36075
Sub-Saharan Africa	-0.05	8.05	31.44	5.65	36120
Pickup Method					
Bank account	-0.06	6.78	31.44	6.18	67532
Cash	-0.06	6.37	31.33	3.93	107512
Mobile wallet	-0.05	4.73	28.30	3.07	7653
Other	-0.06	4.00	12.47	2.75	128
Speed Category					
Less than one hour	-0.06	6.14	31.33	3.88	90409
Same day	-0.06	5.83	30.86	4.24	25097
Next day	-0.06	5.65	31.12	4.50	21784
2 days	-0.06	7.17	31.31	6.10	23167
3-5 days	-0.06	8.23	31.44	6.84	20315
6 days or more	0.00	10.91	31.07	7.81	2053
Negative values	-0.06	-0.03	-0.01	0.02	94

Note: Min, Max, Mean and Std. Dev. are expressed in percentage. The breakdown of cost by region refers to the cost of sending a remittance to that region. As for Firm-Type, the category "Other" includes categories for which it was difficult to attribute a unique label. As for the Pickup Method, the category "Other" includes: *ATM Network, Bank account/Cash, Home Delivery, Debit card.*

Average cost of a $200 remittances by FPS presence



Committee on Payments and Market Infrastructures | BIS | South African Reserve Bank

Methodology

$$Cost_{C_{ijptm}} = \beta_0 \cdot \mathrm{FPS}_{jt}^{year} + \beta_1 \cdot \mathrm{Speed}_{C_{ijptm}} + \mathrm{Z}_{jt}^{year} + \delta_{C_{ij*q}} + \gamma_p + \omega_m + \tau_t + \epsilon_{C_{ijptm}}$$

The quarterly cost, expressed as percentage of the amount sent, for sending a remittance from country *i* to country *j* through PSP *p* at time *t* collected using method *m*

Methodology

$$Cost_{C_{ijptm}} = \beta_0 \cdot \mathrm{FPS}_{jt}^{year} + \beta_1 \cdot \mathrm{Speed}_{C_{ijptm}} + \mathrm{Z}_{jt}^{year} + \delta_{C_{ij*q}} + \gamma_p + \omega_m + \tau_t + \epsilon_{C_{ijptm}}$$

Binary variable indicating whether receiving jurisdictions *j* has an FPS at time t. This variable varies only across years and not quarters.

Methodology

$$Cost_{C_{ijptm}} = \beta_0 \cdot \mathrm{FPS}_{jt}^{year} + \beta_1 \cdot \mathrm{Speed}_{C_{ijptm}} + \mathrm{Z}_{jt}^{year} + \delta_{C_{ij*q}} + \gamma_p + \omega_m + \tau_t + \epsilon_{C_{ijptm}}$$

Numeric variable representing the number of hours required for the remittance to be credited to the recipient (in logarithm). In the original dataset, this variable is categorical: “Less than 1 hour” is 0 hours. “same day” is 24 hours”, “next day” is 48 etc

Methodology

$$Cost_{C_{ijptm}} = \beta_0 \cdot \text{FPS}_{jt}^{year} + \beta_1 \cdot \text{Speed}_{C_{ijptm}} + Z_{jt}^{year} + \delta_{C_{ij*q}} + \gamma_p + \omega_m + \tau_t + \epsilon_{C_{ijptm}}$$

Set of control variable,namely: per capita GDP and remittance inflows. These variables varies at a yearly frequency.

Methodology

$$Cost_{C_{ijptm}} = \beta_0 \cdot \text{FPS}_{jt}^{year} + \beta_1 \cdot \text{Speed}_{C_{ijptm}} + \text{Z}_{jt}^{year} + \delta_{C_{ij*q}} + \gamma_p + \omega_m + \tau_t + \epsilon_{C_{ijptm}}$$

Set of fixed effects namely: corridor x calendar quarter, PSP, collection method, time (year and quarter).

Results - 1

Regressions on the "treated" sample

	(1)	(2)	(3)	(4)	(5)	(6)
FPS dummy	-0.950***	-1.023***	-0.629***	-0.581***	-0.302***	-0.009
	(0.030)	(0.056)	(0.048)	(0.047)	(0.051)	(0.056)
Speed (log)	0.130***	0.068***	-0.183***	-0.117***	-0.120***	-0.120***
	(0.006)	(0.025)	(0.011)	(0.010)	(0.010)	(0.010)
Fixed Effects						
Corridor × quarter		✓	✓	✓	✓	✓
Firm			✓	✓	✓	✓
Pickup method				✓	✓	✓
Time						✓
Control Variables						
GDP					✓	✓
Remittances In					✓	✓
Observations	131,859	131,859	131,859	131,859	126,256	126,256
RMSE	4.743	4.011	3.096	3.063	3.042	3.035
Adj. R^2	0.011	0.287	0.574	0.583	0.589	0.591
Within R^2		0.009	0.013	0.007	0.011	0.004

Note: Standard errors clustered at the corridor × quarter level in parentheses.

Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The dependent variable is the percentage cost of sending a $200 remittance.

- Regressions ran only on the set of jurisdictions where there is an FPS
- Reduction of cost after the implementation of FPS
- The extent of the reduction diminishes as the set of control increases
- Negative relationship between cost and speed
- Time fixed effects erode the FPS dummy effect

Results - 2

Regressions on the "treated+control" sample

	(1)	(2)	(3)	(4)	(5)	(6)
FPS dummy	-1.284***	-1.023***	-0.659***	-0.621***	-0.592***	-0.249***
	(0.023)	(0.056)	(0.048)	(0.047)	(0.055)	(0.062)
Speed (log)	0.231***	0.145***	-0.140***	-0.095***	-0.093***	-0.089***
	(0.006)	(0.021)	(0.009)	(0.008)	(0.008)	(0.009)
Fixed Effects						
Corridor × quarter		✓	✓	✓	✓	✓
Firm			✓	✓	✓	✓
Pickup method				✓	✓	✓
Time						✓
Control Variables						
GDP					✓	✓
Remittances In					✓	✓
Observations	182,825	182,825	182,825	182,825	171,156	171,156
RMSE	4.810	4.057	3.181	3.156	3.118	3.109
Adj. R^2	0.026	0.301	0.569	0.575	0.583	0.586
Within R^2		0.010	0.008	0.005	0.006	0.003

Note: Standard errors clustered at the corridor × quarter level in parentheses.

Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The dependent variable is the percentage cost of sending a $200 remittance.

- Regressions ran on an extended sample, including jurisdictions without FPS
- Previous results are confirmed
- Time fixed effects do not impact significance of results

Results - 3

Geographical heterogeneity

	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
FPS dummy	-0.615***	-0.655***	0.077	-0.626***	-0.588***	-0.335*
	(0.100)	(0.149)	(0.153)	(0.124)	(0.152)	(0.186)
Speed (log)	-0.036***	-0.098***	-0.046**	-0.023*	-0.033**	-0.037**
	(0.011)	(0.015)	(0.014)	(0.013)	(0.011)	(0.014)
Observations	85,447	64,413	55,877	56,641	75,080	65,943
RMSE	3.032	3.313	3.042	3.018	2.967	3.281
Adj. R^2	0.615	0.542	0.595	0.599	0.628	0.607
Within R^2	0.0039	0.0067	0.0068	0.0076	0.0042	0.0063

Note: Standard errors in parentheses. Significance levels: * p< 0.10, ** p< 0.05, *** p< 0.01. The dependent variable is the percentage cost of sending a $200 remittance. GDP and Remittances inflows are included as control variables as well as the complete set of fixed effects: *corridor* × *quarter*, *Firm and Time*.

- Model with the largest set of control applied to regional observations
- Treatment is regional, control is global for comparability
- Significant heteroegeneity across regions
- LATAM no effect, SSA smallest effect

Results - 4

Testing the competition channel

	Global	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
First Stage (FirmNum)							
FPS dummy	0.249**	0.347*	0.019	0.118	-0.748***	0.617*	0.874***
	(0.101)	(0.188)	(0.164)	(0.279)	(0.197)	(0.244)	(0.224)
Second Stage (Cost)							
FirmNum (fitted)	-1.001*	-1.772*	-33.739	0.651	0.837**	-0.953*	-0.384*
	(0.511)	(1.065)	(285.177)	(1.630)	(0.287)	(0.454)	(0.211)
Speed (log)	-0.101***	-0.074**	-0.310	-0.039*	-0.021	-0.040**	-0.039**
	(0.012)	(0.027)	(1.809)	(0.022)	(0.014)	(0.014)	(0.014)
Observations	171,156	85,447	64,413	55,877	56,641	75,080	65,943
RMSE	3.435	3.882	39.100	3.135	3.186	3.253	3.317
Adj. R^2	0.494	0.369	-62.900	0.570	0.554	0.553	0.599
Within R^2	-0.217	-0.633	-137.600	-0.055	-0.106	-0.197	-0.015
F-test (1st stage)	338.4***	245.3***	0.60	12.7***	589.7***	345.8***	714.4***
Wu-Hausman	74.3***	155.1***	82.0***	0.78	66.0***	69.1***	15.4***

Note: Standard errors in parentheses. Significance levels: * p< 0.10, ** p< 0.05, *** p< 0.01.
The first stage regresses the number of firms on the FPS dummy and controls. The second stage estimates the effect of the fitted number of firms on remittance cost. GDP and Remittances inflows are included as control variables as well as the complete set of fixed effects: *corridor* × *quarter*, *Firm and Time*.

- Largest set of controls considered
- Treatment is regional, control is global for comparability
- Average number of firms per corridor with a fixed receiving country
- General increase of the number of operators after implementing FPS
- Strongest effect SSA

Wrap up

- Jurisdiction which have an FPS show a reduction in cost of received remittances which ranges between 0.2 to 1.3 percentage points of the amount sent
- This effect is geographically heterogeneous
- Instrumental variable approach show that the reduction in the cost of remittances seems to be driven by an increased number of PSPs supporting the idea that the domestic implementation of an FPS stimulates competition
- Speed and cost of remittances are in a negative relationship. Improving both can be challenging
- Arrangements such as interlinking can amplify benefits of FPS to cross-border payments

G20
SOUTH AFRICA 2025

Solidarity
Equality
Sustainability

South African Reserve Bank

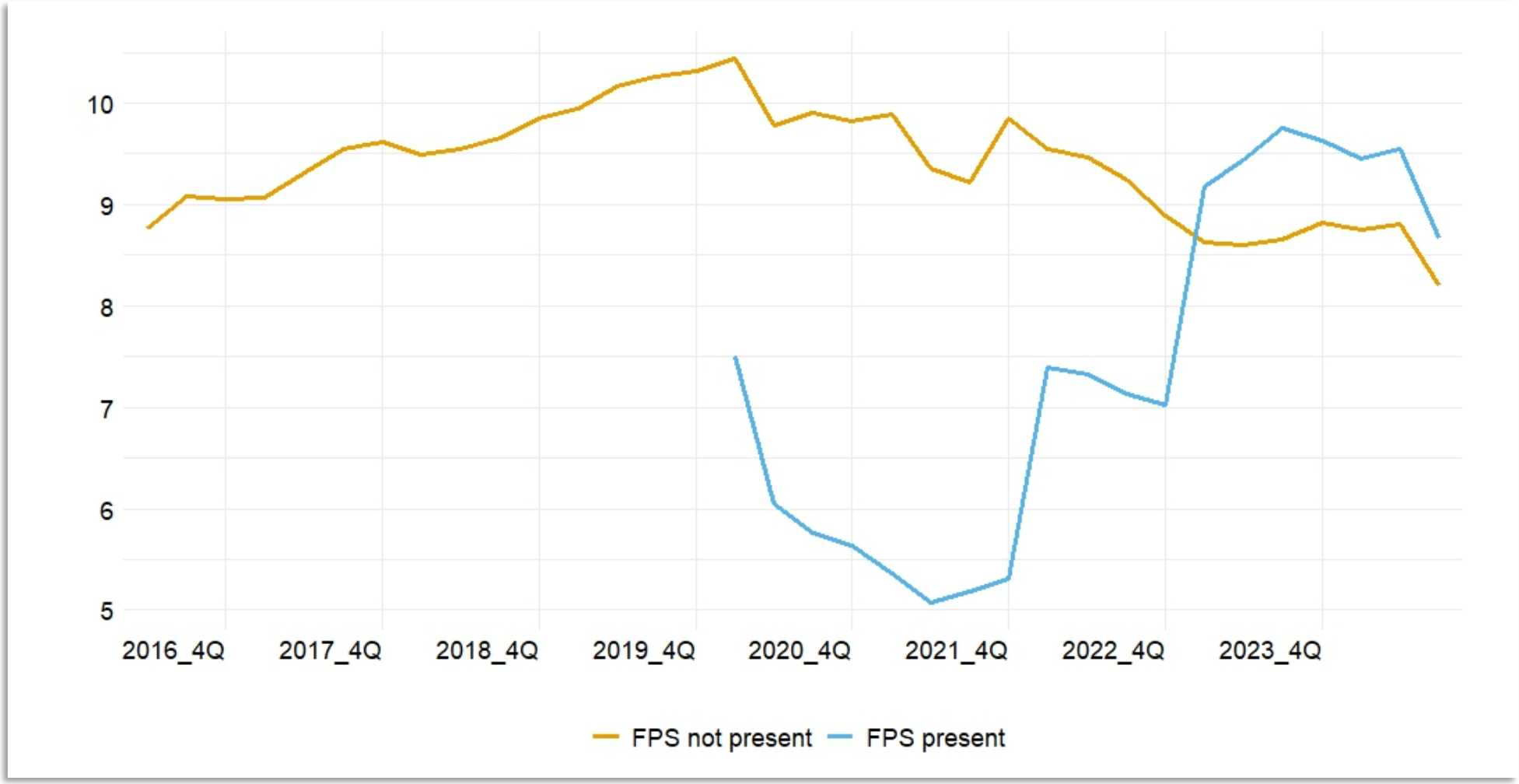
Committee on Payments and Market Infrastructures | BIS

Thank you for your attention!

Alberto Di Iorio
alberto.diiorio@bancaditalia.it

Results - 6

Average number of PSPs serving corridors in MENA region



Results - 7

Estimates for 500$

	Full sample	Fixed Fee vs FX Margin		Payment Method Analysis		
	Cost	FX Margin	Fixed Fee	Cash	Mobile Wallet	Bank Account
FPS dummy	-0.168**	-0.163***	-0.005	-0.236***	-0.215	-0.017
	(0.051)	(0.044)	(0.028)	(0.062)	(0.192)	(0.059)
Speed (log)	-0.068***	-0.003	-0.065***	-0.030***	0.013	-0.038***
	(0.006)	(0.005)	(0.004)	(0.007)	(0.024)	(0.011)
Observations	170,303	170,303	170,303	99,008	6,312	64,886
RMSE	2.235	1.776	1.391	2.245	1.855	1.938
Adj. R^2	0.492	0.409	0.568	0.467	0.475	0.633
Within R^2	0.0032	0.0029	0.0052	0.0019	0.0031	0.0038

Note: Standard errors in parentheses. Significance levels: * p< 0.10, ** p< 0.05, *** p< 0.01.
Fixed effects: corridor × quarter, period, firm, pickup method (where applicable).
Standard errors clustered at the corridor × quarter level.

Results - 8

Heterogeneity across regions for $500 remittances

	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
FPS dummy	-0.448***	-0.656***	0.084	-0.567***	-0.218*	-0.337*
	(0.079)	(0.127)	(0.159)	(0.115)	(0.117)	(0.149)
Speed (log)	-0.031***	-0.071***	-0.043***	-0.026**	-0.025**	-0.038***
	(0.008)	(0.011)	(0.011)	(0.010)	(0.009)	(0.010)
Observations	85,065	64,088	55,500	56,284	74,550	65,431
RMSE	2.212	2.405	2.330	2.283	2.160	2.465
Adj. R^2	0.502	0.463	0.483	0.503	0.537	0.481
Within R^2	0.0049	0.0082	0.0092	0.0102	0.0054	0.0092

Note: Standard errors in parentheses. Significance levels: * p< 0.10, ** p< 0.05, *** p< 0.01. The dependent variable is the percentage cost of sending a $500 remittance. GDP and Remittances inflows are included as control variables as well as the complete set of fixed effects: *corridor* × *quarter*, *Firm*, *Period*, *and Pickup Method*.

Results - 9

Instrumental variable approach for $500 remittances

	Global	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
First Stage (FirmNum)							
FPS dummy	0.247*	0.342*	0.018	0.115	-0.743***	0.599*	0.867***
	(0.101)	(0.188)	(0.163)	(0.277)	(0.197)	(0.243)	(0.223)
Second Stage (Cost)							
FirmNum (fitted)	-0.681*	-1.309*	-36.241	0.733	0.763**	-0.364	-0.389*
	(0.363)	(0.776)	(326.492)	(1.946)	(0.263)	(0.245)	(0.184)
Speed (log)	-0.076***	-0.058**	-0.272	-0.036*	-0.026*	-0.028**	-0.040***
	(0.009)	(0.019)	(1.831)	(0.021)	(0.011)	(0.010)	(0.010)
Observations	170,303	85,065	64,088	55,500	56,284	74,550	65,431
RMSE	2.444	2.834	41.900	2.488	2.469	2.222	2.510
Adj. R^2	0.393	0.182	-162.300	0.410	0.418	0.510	0.462
Within R^2	-0.191	-0.634	-300.300	-0.129	-0.158	-0.052	-0.027
F-test (1st stage)	330.5***	237.0***	0.52	12.0***	578.8***	319.5***	698.9***
Wu-Hausman	64.2***	155.1***	156.1***	1.66	96.4***	18.4***	25.2***

Note: Standard errors in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.
The first stage regresses the number of firms on the FPS dummy and controls. The second stage estimates the effect of the fitted number of firms on remittance cost. GDP and Remittances inflows are included as control variables as well as the complete set of fixed effects: *corridor* × *quarter*, *Firm and Time*.