



“Space in the Emerging Economies of Latin America: An Investigation Through the Lens of a Macro-Environmental Framework”



Adriana Ordonez, Sophia Gustely, Dr. Tinoco
David B. O'Maley College of Business

Introduction

We investigate the emerging economies of Argentina, Brazil, Colombia, and Mexico and their space industry through the lens of the political/legal, economic, sociocultural, technological, and environmental (PESTEL) macro-environmental framework.



Methodology

Collection of primary and secondary data through interviews and literature review.

Examination of the space industry of selected countries through a PESTEL analysis to determine their positioning within one another.

Political/Legal

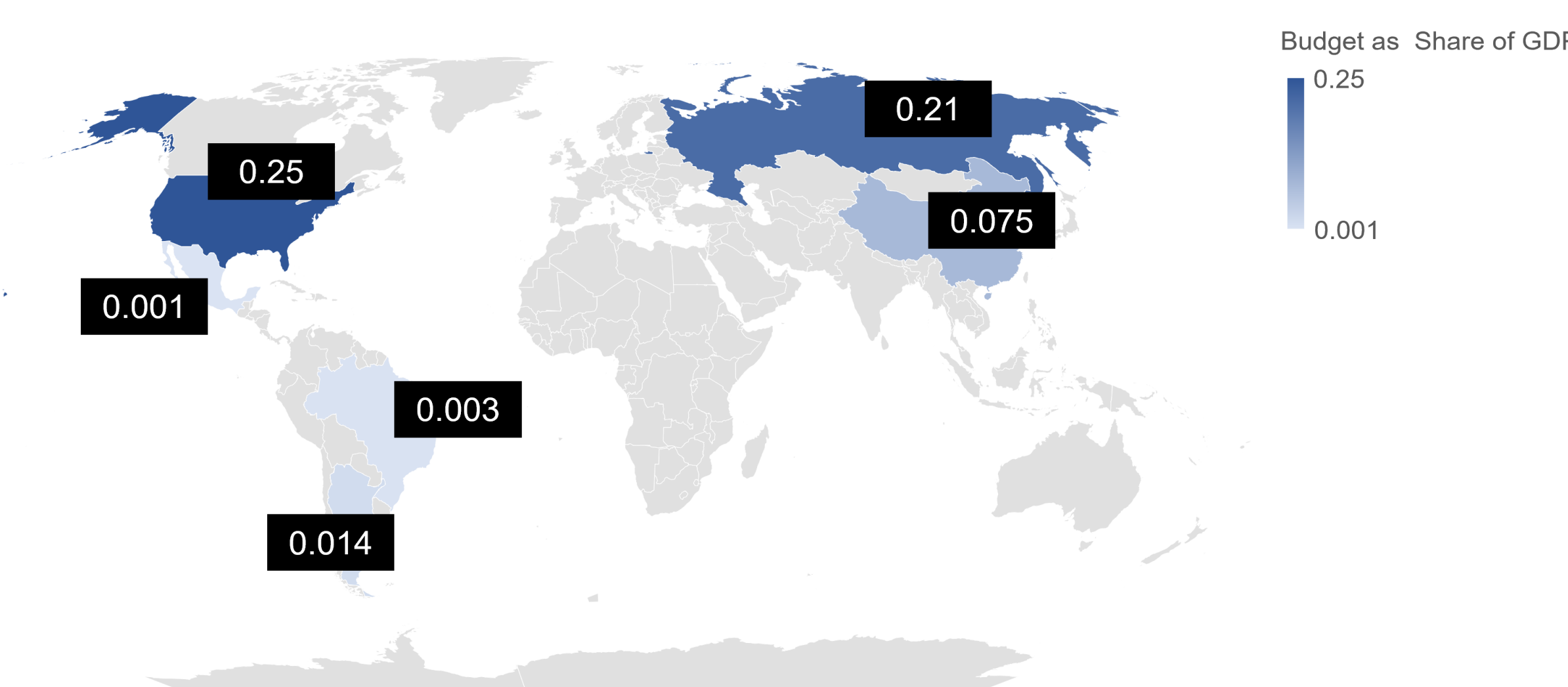
Country	Space Agency	Operational Level	Founded
Argentina	Argentina National Space Activities Commission (CONAE)	Level 2	1991
Brazil	Brazilian Space Agency (AEB)	Level 3	1994
Colombia	Colombian Space Commission (CCE)	Level 2	2006
Mexico	Mexican Space Agency (AEM)	Level 2	2010

Level 1	Level 2	Level 3
Countries focused on ground-based space activities	Countries that also operate satellites	Countries that conduct launches

Economic

Budgets as a share of GDP compared to power space nations (US, China, Russia).

Government Space Budgets for G20 Countries (2020)
As a share of GDP



Sociocultural

Communication satellites used by each country for societal benefit

Communication Satellites			
Argentina	Brazil	Colombia	Mexico
~6	~13	~0	~10
AARSAT 1 AARSAT 2 NAHUEL 1A LATINSAT A LATINSAT B CUBEBUG 2	PION BR1 STARONE D2 Al Yah 3 SES 14 AMAZONAS (1,2,3,4A,5) SGDC SKY BRASIL -1 Star One D1, C4 STARONE (C1,C2,C3) TELSTAR 14R BRAZILSAT (B2,B3,B4) MICROSAT 2 (Oscar17)		MORELOS (1,2,3) SOLIDARIDAD 2 SATMEX (6,8,9) QUETZAT 1 BICENTENARIO SKY MEXICO 1

Technological

Presence in space by number of satellites.

Presence in Space (Satellites)				
	Argentina	Brazil	Colombia	Mexico
Total	~15	~21	~1	~13
Communication	~6	~13	~0	~10
Earth Observation	~5	~2	~1	~2
Scientific/Research	~7	~6	~0	~3

Environmental

Satellites used for Earth Observation applications by country.

Earth Observation Satellites			
Argentina	Brazil	Colombia	Mexico
~5	~2	~1	~2
SAC C SAC D AQUARIUS SAOCOM 1A SAOCOM 1B MDQSAT 1	AMAZONIA 1 CBERS 4A	FACSAT-1	MORELOS 3 PAINANI 1

PESTEL Comparison Chart

Comparison of Argentina, Brazil, Colombia, and Mexico in terms of weighted PESTEL components.

Category	Topic	Weight	Argentina	W/A	Brazil	W/A	Colombia	W/A	Mexico	W/A
Political/Legal	National Space Agency	10%	10	1	10	1	10	1	10	1
	Space Policy	8%	10	0.8	10	0.8	2	0.16	4	0.32
	Commercial activity	4%	8	0.32	6	0.24	2	0.08	6	0.24
	Artemis accords and other international treaties	3%	6	0.18	8	0.24	6	0.18	10	0.3
Economic	Budget	15%	10	1	8	0.8	1	0.1	6	0.6
	Economic growth (GDP growth per capita)	5%	8	0.4	4	0.2	10	0.5	5	0.25
Socio-cultural	Communication (satellites)	10%	6	0.6	10	1	0	0	8	0.8
	University support	20%	10	0.6	10	0.6	3	0.18	7	0.42
	Community attitude over space	4%	0	0	0	0	0	0	0	0
Technology	Presence in Space (Satellites)	10%	8	0.8	10	1	1	0.1	6	0.6
	R&D of Space Development	25%	8	0.72	10	0.9	4	0.36	6	0.54
	Spaceport infrastructure	6%	0	0	10	0.6	0	0	0	0
Environment	Earth observation (satellites)	15%	10	1	6	0.6	2	0.2	6	0.6
	Earth applications from satellite data	5%	10	0.5	8	0.4	2	0.1	4	0.2
Total Score		100%	104	7.92	110	8.38	43	2.96	78	5.87



Next Steps

Finalize paper deliverable.

References

See authors for references.