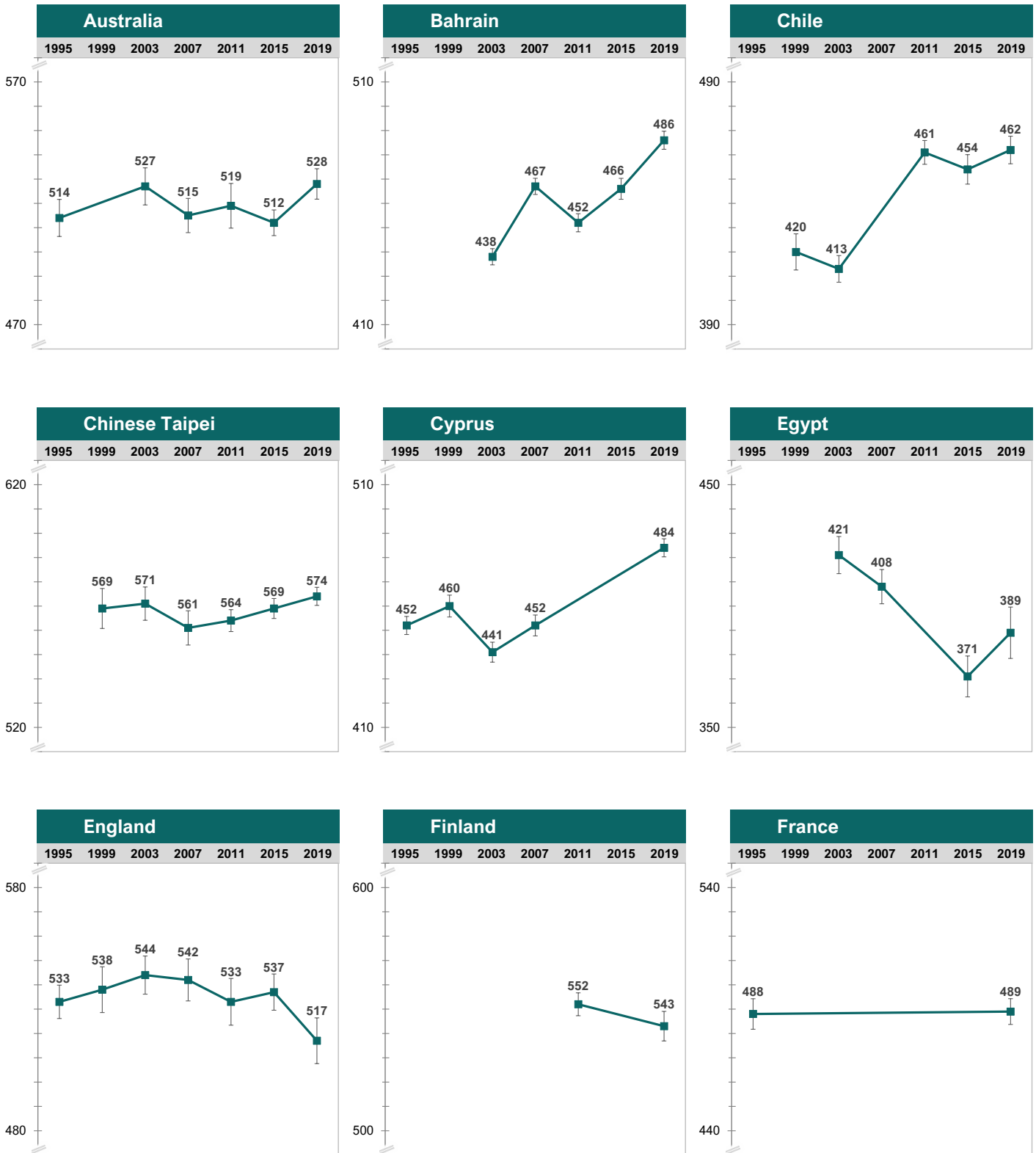


Exhibit 4.3: Trend Plots of Average Science Achievement Across Assessment Years

This exhibit displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 4.4) provides details, including statistical significance. See Appendix A for country participation in previous assessments.

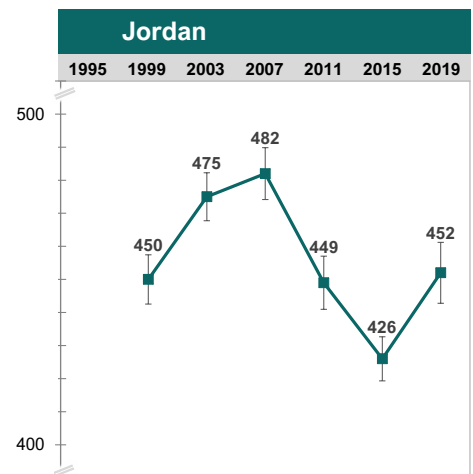
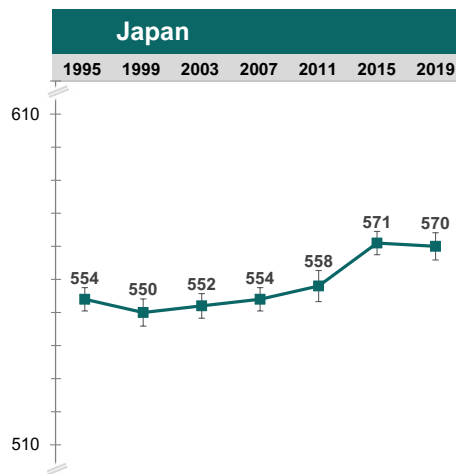
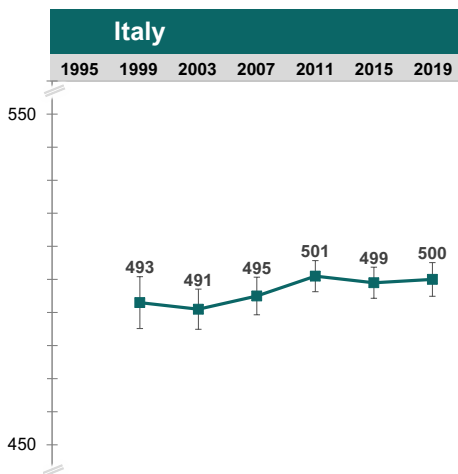
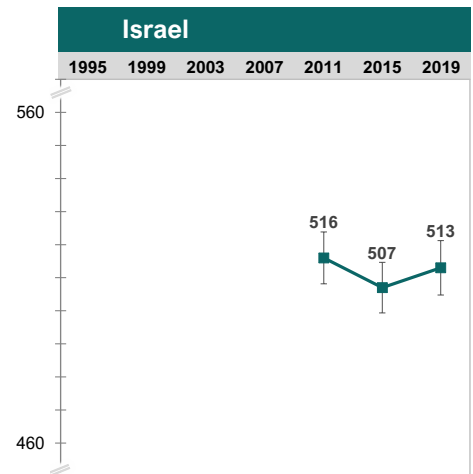
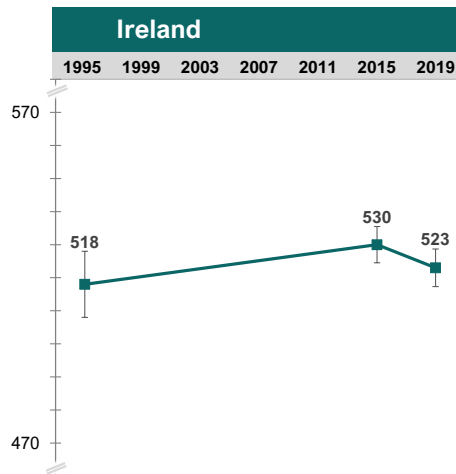
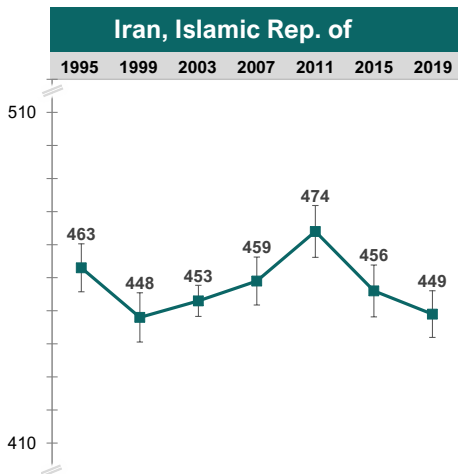
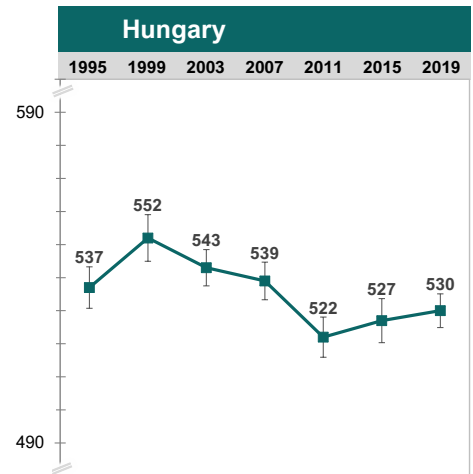
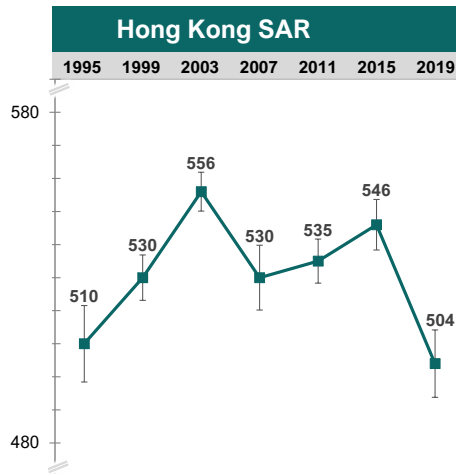
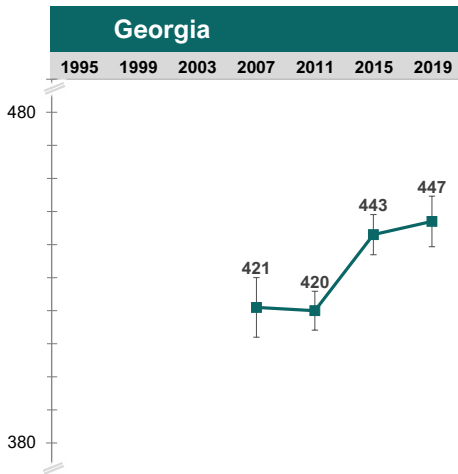


See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I. The black bars represent the 95% confidence interval.

Exhibit 4.3: Trend Plots of Average Science Achievement Across Assessment Years

(Continued)

This exhibit displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 4.4) provides details, including statistical significance. See Appendix A for country participation in previous assessments.

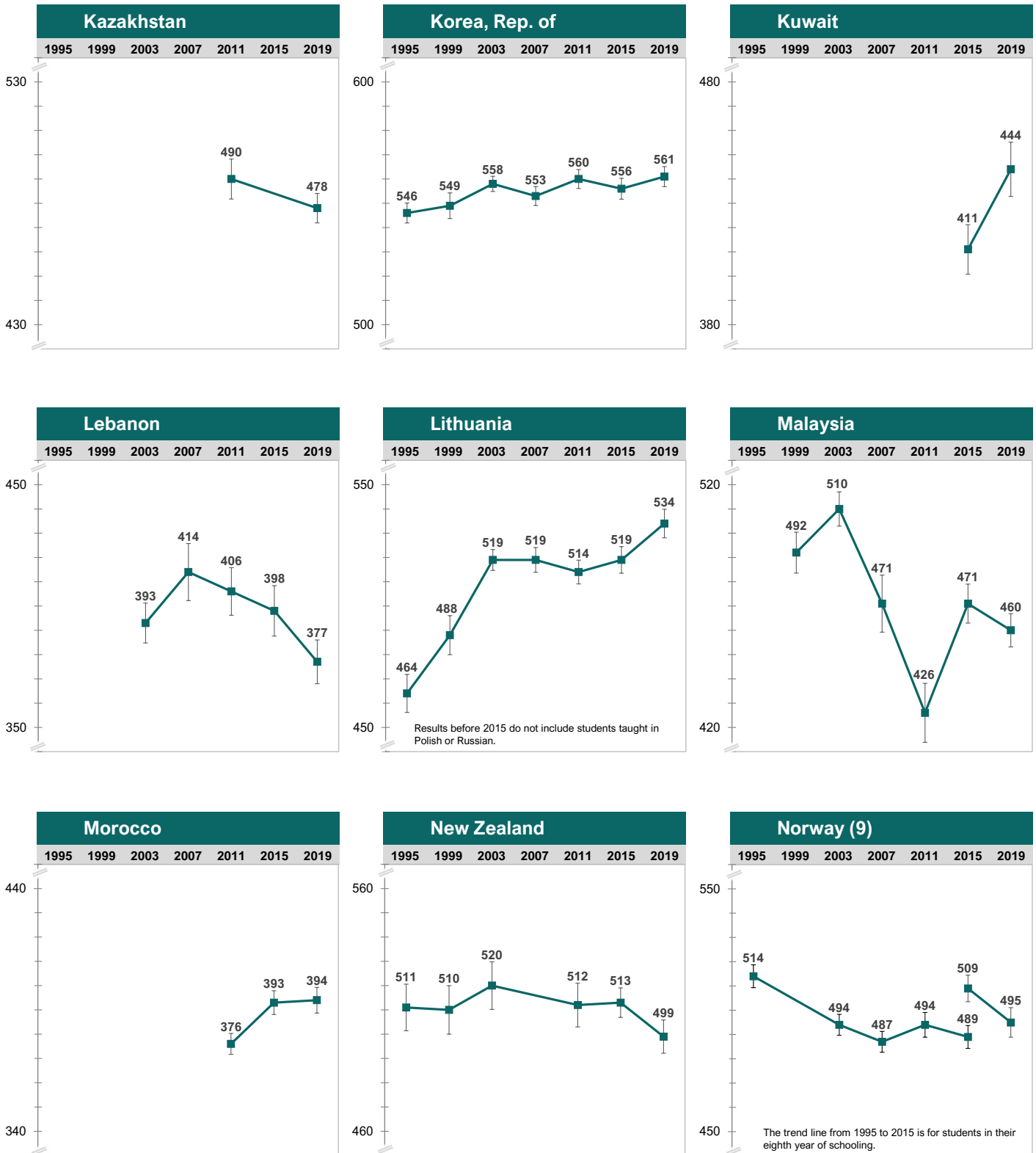


See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I. The black bars represent the 95% confidence interval.

Exhibit 4.3: Trend Plots of Average Science Achievement Across Assessment Years

(Continued)

This exhibit displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 4.4) provides details, including statistical significance. See Appendix A for country participation in previous assessments.

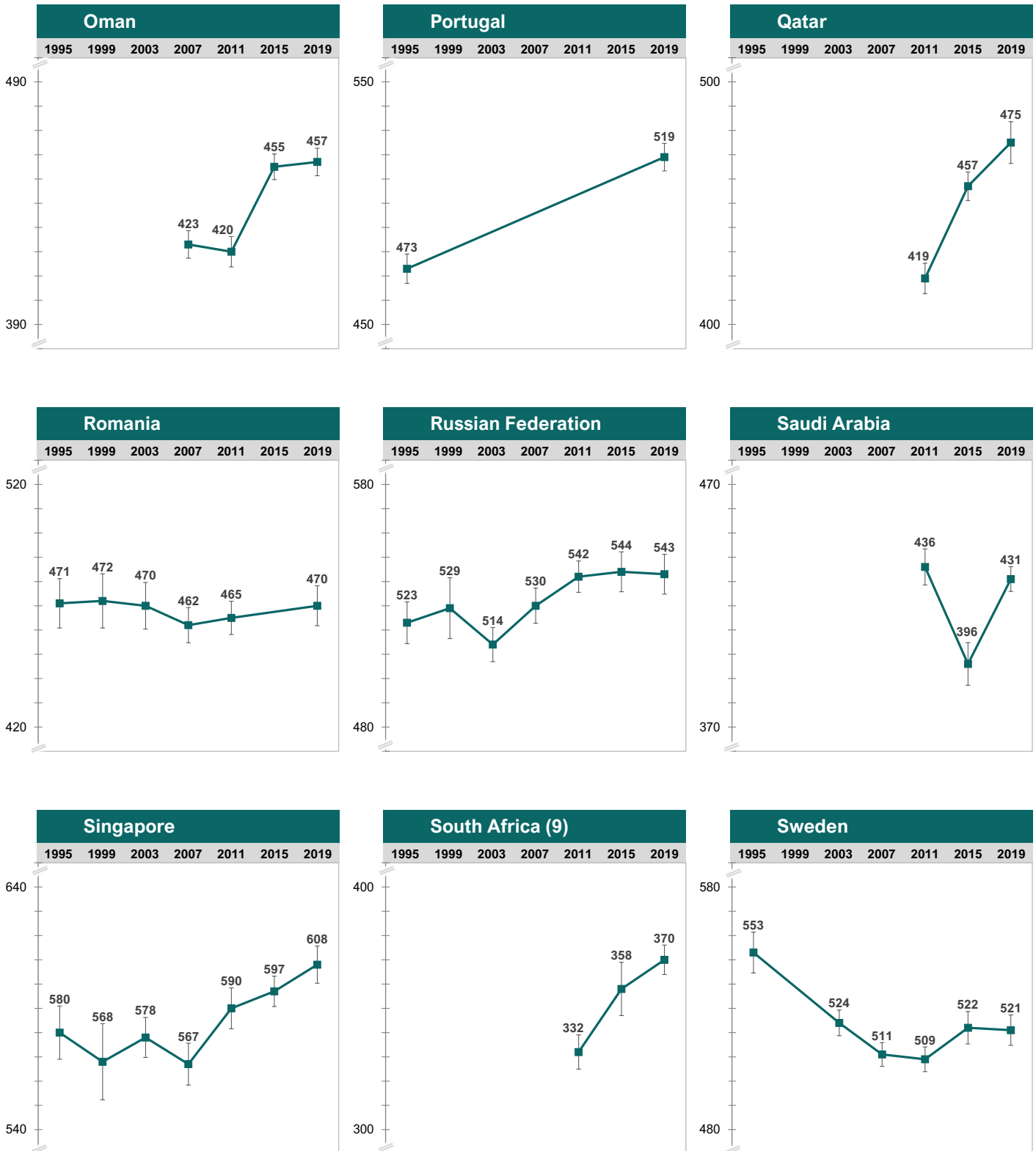


See Appendix A for country participation in previous TIMSS assessments. The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement. I. The black bars represent the 95% confidence interval.

Exhibit 4.3: Trend Plots of Average Science Achievement Across Assessment Years

(Continued)

This exhibit displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 4.4) provides details, including statistical significance. See Appendix A for country participation in previous assessments.

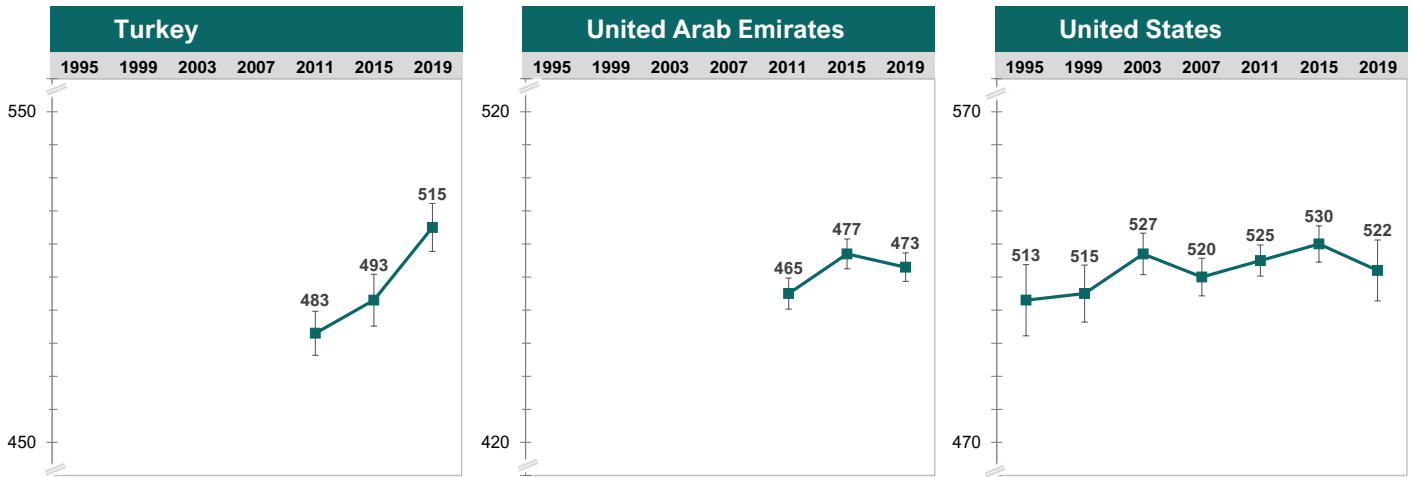


See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I. The black bars represent the 95% confidence interval.

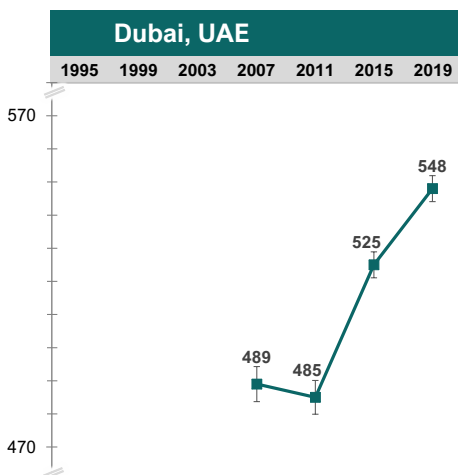
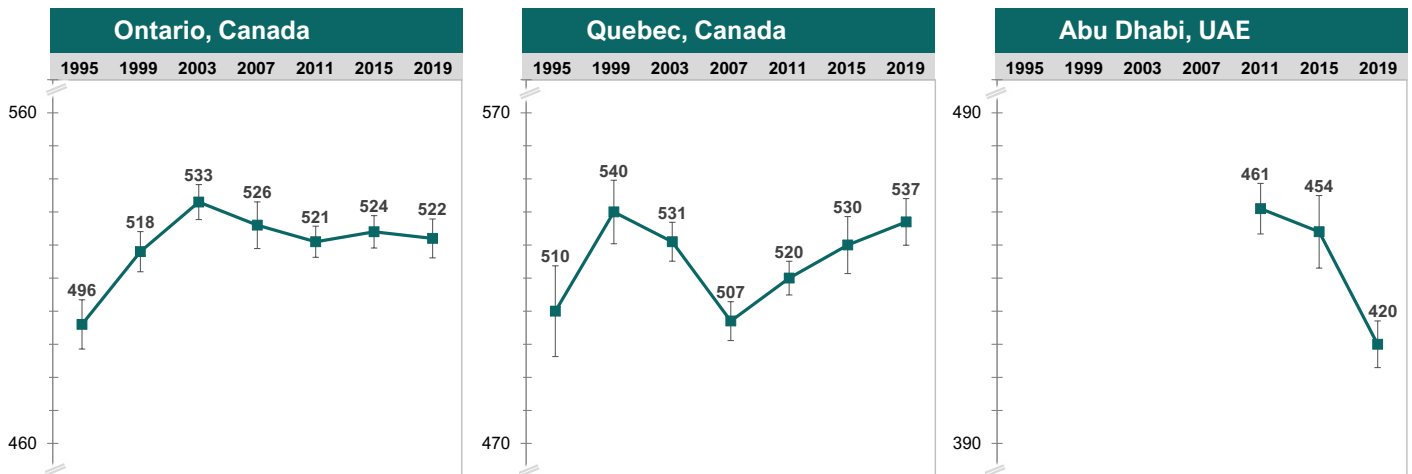
Exhibit 4.3: Trend Plots of Average Science Achievement Across Assessment Years

(Continued)

This exhibit displays changes in achievement for the countries and benchmarking participants that have comparable data from previous TIMSS assessments. The accompanying table (Exhibit 4.4) provides details, including statistical significance. See Appendix A for country participation in previous assessments.



Benchmarking Participants



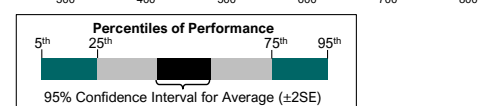
See Appendix A for country participation in previous TIMSS assessments.
 The scale interval is 10 points for each country, but a different part of the scale is shown according to each country's average achievement.
 I. The black bars represent the 95% confidence interval.

Exhibit 4.4: Differences in Average Science Achievement Across Assessment Years

Read across the row to determine if the performance in the row year is significantly higher (▲) or significantly lower (▼) than the performance in the column year.

Country	Average Scale Score	Differences Between Years						Science Achievement Distribution
		2015	2011	2007	2003	1999	1995	
Australia								
2019	528 (3.2)	16 ▲	9	14 ▲	1		15 ▲	
2015	512 (2.7)		-7	-3	-15 ▼		-2	
2011	519 (4.7)			4	-8		6	
2007	515 (3.6)				-12 ▼		1	
2003	527 (3.9)						13 ▲	
‡ 1995	514 (3.9)							
Bahrain								
2019	486 (1.9)	20 ▲	34 ▲	19 ▲	48 ▲			
2015	466 (2.2)		13 ▲	-2	28 ▲			
2011	452 (1.9)			-15 ▼	14 ▲			
2007	467 (1.7)				29 ▲			
2003	438 (1.7)							
Chile								
2019	462 (2.9)	8 ▲	1		49 ▲	42 ▲		
2015	454 (3.1)		-7		41 ▲	34 ▲		
2011	461 (2.5)				49 ▲	41 ▲		
2003	413 (2.8)					-8		
1999	420 (3.8)							
Chinese Taipei								
2019	574 (1.9)	5	11 ▲	13 ▲	3	5		
2015	569 (2.1)		6	8 ▲	-2	0		
2011	564 (2.3)			3	-7	-5		
2007	561 (3.6)				-10 ▼	-8		
2003	571 (3.5)					2		
1999	569 (4.2)							
Cyprus								
2019	484 (1.9)			32 ▲	42 ▲	23 ▲	32 ▲	
2007	452 (2.2)				10 ▲	-9 ▼	0	
2003	441 (2.1)					-19 ▼	-11 ▼	
1999	460 (2.3)						8 ▲	
1995	452 (1.9)							
Egypt								
² 2019	389 (5.4)	19 ▲		-19 ▼	-32 ▼			
2015	371 (4.3)			-37 ▼	-50 ▼			
2007	408 (3.6)				-13 ▼			
2003	421 (3.9)							
England								
2019	517 (4.8)	-20 ▼	-16 ▼	-25 ▼	-27 ▼	-22 ▼	-17 ▼	
2015	537 (3.8)		4	-5	-7	-2	3	
‡ 2011	533 (4.9)			-9	-11	-5	0	
† 2007	542 (4.4)				-2	3	8	
≡ 2003	544 (4.0)					5	11 ▲	
† 1999	538 (4.8)						5	
³ † 1995	533 (3.5)							
Finland								
2019	543 (3.1)		-10 ▼					
2011	552 (2.4)							
France								
2019	489 (2.7)						1	
1995	488 (3.2)							
Georgia								
¹ 2019	447 (3.9)	4	27 ▲	26 ▲				
^{1,2} 2015	443 (3.1)		23 ▲	22 ▲				
¹ 2011	420 (3.0)			-1				
¹ 2007	421 (4.6)							
Hong Kong SAR								
† 2019	504 (5.2)	-42 ▼	-32 ▼	-27 ▼	-53 ▼	-26 ▼	-6	
2015	546 (3.9)		11 ▲	16 ▲	-10 ▼	16 ▲	36 ▲	
2011	535 (3.4)			5	-21 ▼	6	25 ▲	
† 2007	530 (5.0)				-26 ▼	1	20 ▲	
† 2003	556 (3.0)					27 ▲	46 ▲	
† 1999	530 (3.5)						20 ▲	
1995	510 (5.9)							

▲ Average from more recent year significantly higher
▼ Average from more recent year significantly lower



See Appendix A for country participation in previous TIMSS assessments.

See Appendix B.7 for population coverage notes 1, 2, and 3. See Appendix B.10 for sampling guidelines and sampling participation notes †, ‡, and ≡.

() Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

Exhibit 4.4: Differences in Average Science Achievement Across Assessment Years

(Continued)

Country	Average Scale Score	Differences Between Years						Science Achievement Distribution
		2015	2011	2007	2003	1999	1995	
Hungary								
2019	530 (2.6)	2	7	-9 ▽	-13 ▽	-23 ▽	-7	
2015	527 (3.4)		5	-12 ▽	-16 ▽	-25 ▽	-9 ▽	
2011	522 (3.1)			-17 ▽	-20 ▽	-30 ▽	-14 ▽	
2007	539 (2.9)				-4	-13 ▽	2	
² 2003	543 (2.8)					-10 ▽	6	
1999	552 (3.6)						16 ▲	
1995	537 (3.2)							
Iran, Islamic Rep. of								
2019	449 (3.6)	-7	-25 ▽	-10	-4	1	-13 ▽	
2015	456 (4.0)		-18 ▽	-3	3	8	-6	
2011	474 (4.0)			15 ▲	21 ▲	26 ▲	12 ▲	
2007	459 (3.7)				6	11 ▲	-4	
² 2003	453 (2.4)					5	-9 ▽	
1999	448 (3.8)						-15 ▽	
1995	463 (3.7)							
Ireland								
2019	523 (2.9)	-7					5	
2015	530 (2.8)						12 ▲	
1995	518 (5.1)							
Israel								
³ 2019	513 (4.2)	7	-2					
³ 2015	507 (3.9)		-9					
³ 2011	516 (4.0)							
Italy								
2019	500 (2.6)	2	-1	5	10 ▲	7		
² 2015	499 (2.4)		-2	4	8 ▲	6		
2011	501 (2.4)			6	10 ▲	8		
2007	495 (2.9)				4	2		
2003	491 (3.1)					-2		
² 1999	493 (4.0)							
Japan								
2019	570 (2.1)	-1	12 ▲	16 ▲	17 ▲	20 ▲	15 ▲	
2015	571 (1.8)		13 ▲	17 ▲	19 ▲	21 ▲	16 ▲	
2011	558 (2.4)			4	6	8 ▲	3	
2007	554 (1.8)				2	4	-1	
2003	552 (1.9)					3	-2	
1999	550 (2.1)						-5	
1995	554 (1.8)							
Jordan								
2019	452 (4.7)	26 ▲	3	-30 ▽	-23 ▽	2		
2015	426 (3.4)		-23 ▽	-56 ▽	-49 ▽	-24 ▽		
2011	449 (4.1)			-33 ▽	-26 ▽	-1		
2007	482 (4.0)				7	31 ▲		
2003	475 (3.7)					25 ▲		
1999	450 (3.8)							
Kazakhstan								
² 2019	478 (3.1)		-12 ▽					
2011	490 (4.2)							
Korea, Rep. of								
2019	561 (2.1)	5	1	8 ▲	2	12 ▲	15 ▲	
2015	556 (2.2)		-5	2	-3	7 ▲	10 ▲	
2011	560 (2.0)			7 ▲	2	12 ▲	14 ▲	
2007	553 (2.0)				-5 ▽	4	7 ▲	
2003	558 (1.6)					10 ▲	13 ▲	
1999	549 (2.7)						3	
1995	546 (2.1)							
Kuwait								
2019	444 (5.7)	33 ▲						
2015	411 (5.2)							
Lebanon								
2019	377 (4.6)	-21 ▽	-29 ▽	-37 ▽	-17 ▽			
2015	398 (5.3)		-8	-15	5			
2011	406 (5.0)			-8	13			
2007	414 (6.0)				20 ▲			
2003	393 (4.2)							

▲ Average from more recent year significantly higher
 ▽ Average from more recent year significantly lower

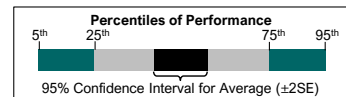


Exhibit 4.4: Differences in Average Science Achievement Across Assessment Years

(Continued)

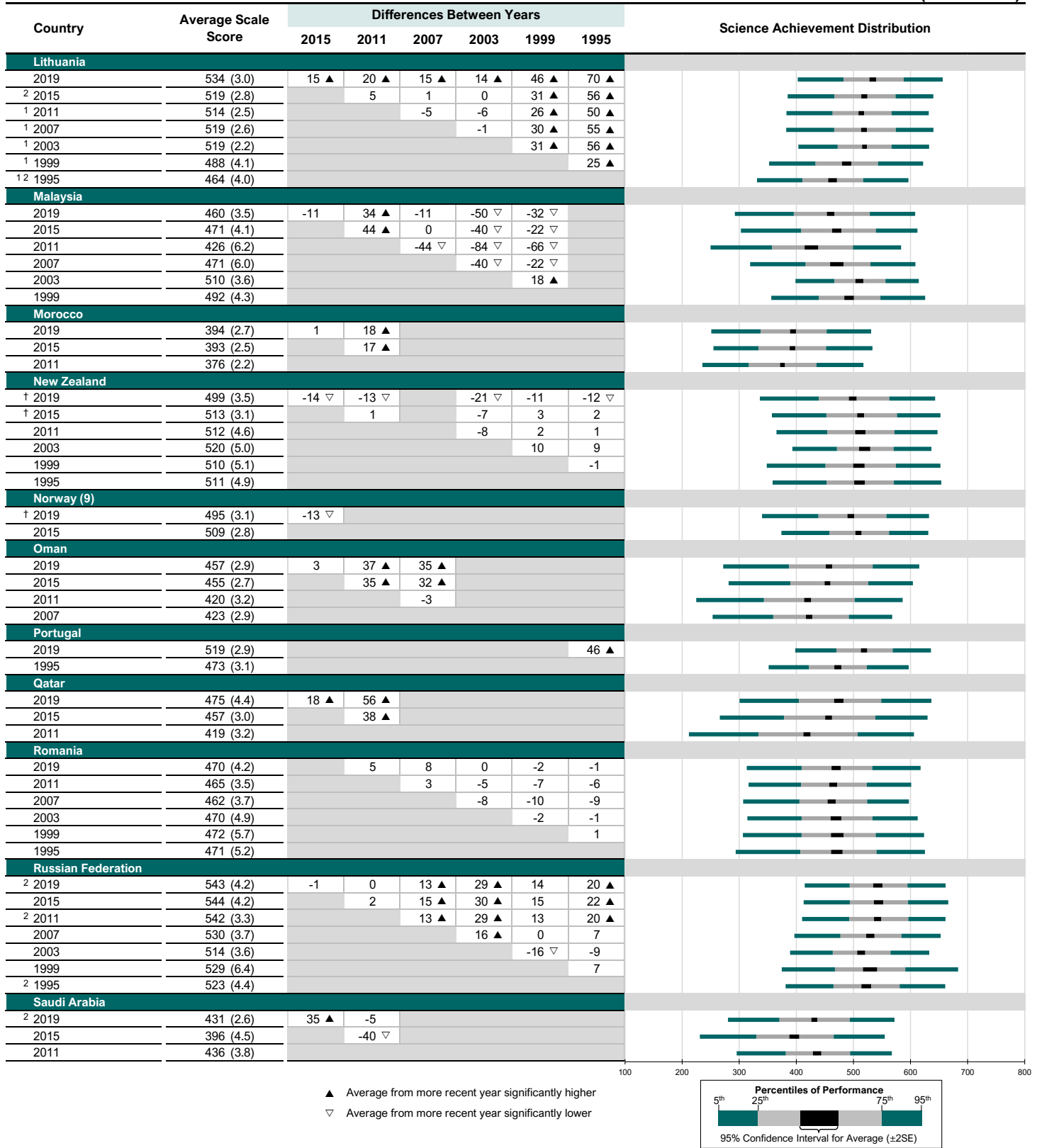
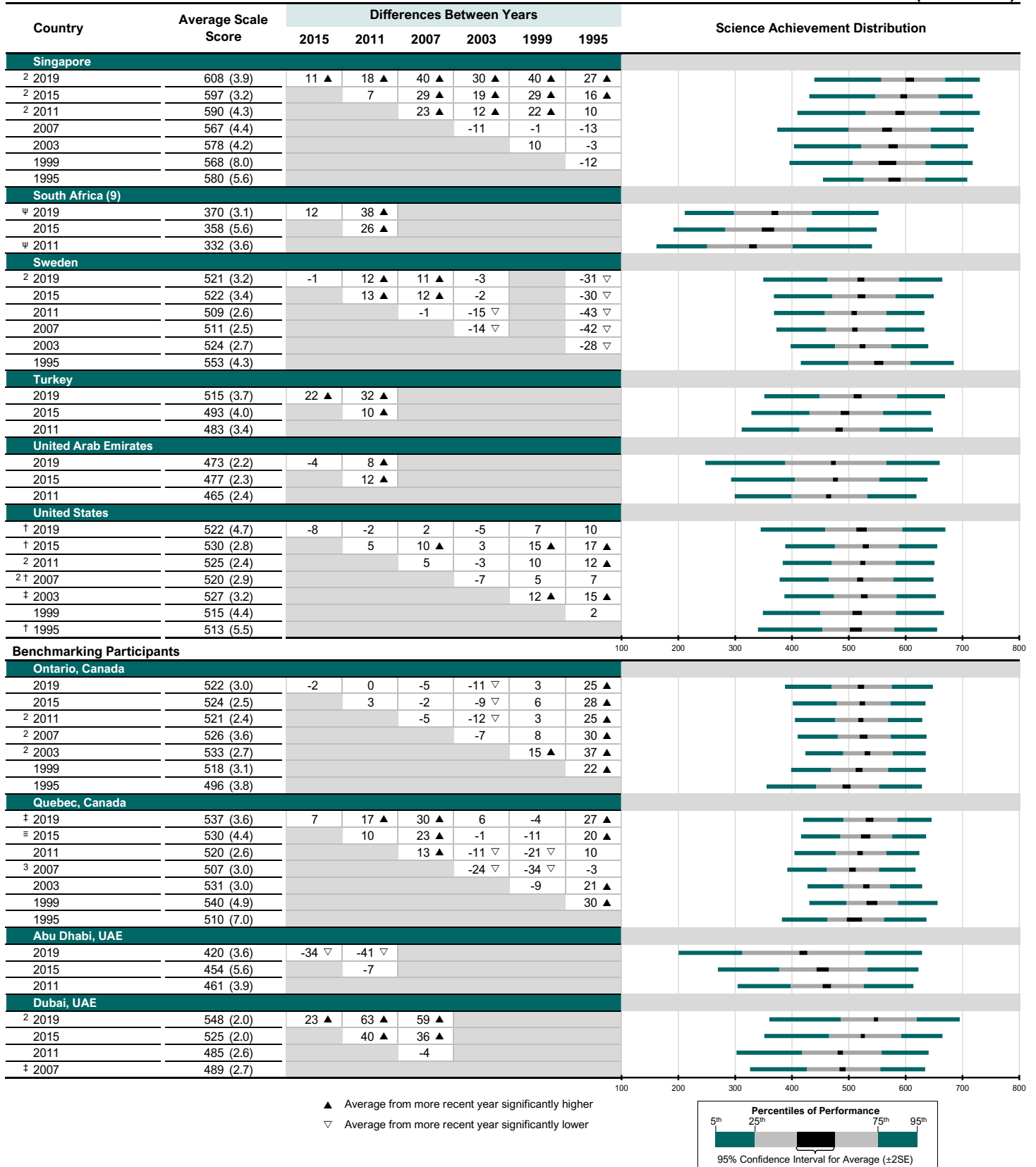
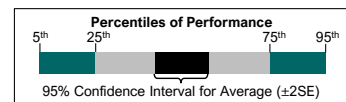


Exhibit 4.4: Differences in Average Science Achievement Across Assessment Years

(Continued)



▲ Average from more recent year significantly higher
 ▽ Average from more recent year significantly lower



ψ Reservations about reliability because the percentage of students with achievement too low for estimation exceeds 15% but does not exceed 25%.