

To News Editors

6 December 2016

CUHK Releases the Results of Programme for International Student Assessment 2015

The Hong Kong Centre for International Student Assessment of the Hong Kong Institute of Educational Research at The Chinese University of Hong Kong (CUHK) released the survey results of the Programme for International Student Assessment 2015 (PISA 2015) today (6 December). The survey reveals that Hong Kong 15-year-old students again stand in the top tier of 72 participating countries and economies.

During April to May 2015, about 5,000 students from 138 secondary schools were randomly selected for the computer-based assessment of student performance in science, reading (Chinese) and mathematics. Specifically, Hong Kong students rank ninth in science and second in both reading and mathematics (**Figure 1 and Appendix 1**).

As well as this, equality in education in terms of how students' socio-economic status (SES), gender, and immigrant status affect their academic performance is examined. It is found that students' SES, including occupation and education level of their parents, has a relatively small impact on their performance (**Figure 2 and Appendix 2**). Yet significant gender difference is still evident in student performance. Girls outperform boys by 28 points in reading whereas no significant gender difference is found in science and mathematics (**Figure 3**). Also, the performance of immigrant students, no matter they were born in or outside Hong Kong, is significantly poorer than that of native students, with a difference up to 6 to 17 points (**Figure 4**). It indicates that immigrant students need more support in their learning.

Various outcomes of students' self-related cognition and engagement in science activities are also examined. Results show that the extrinsic (instrumental) motivation and enjoyment of science of Hong Kong students are higher than the Organisation for Economic Co-operation and Development (OECD) average, but their science self-efficacy is lower than the OECD average. Students' extrinsic (instrumental) motivation in learning science has improved significantly from 2006 to 2015. Yet, their enjoyment of science and self-efficacy in science has declined significantly (**Figure 5**). Students' self-related cognition in science and engagement in science activities are found to have positive correlations with their science performance (**Figure 6**).

Regarding parental factors, parents' previous provision of science activities, current social communication with and emotional support for children are found to be correlated with their children's science performance. Parents' provision of science activities for the child at about age 10 (e.g., watching TV programmes about science) has a positive impact on the learning outcomes. If a parent communicates more with the child (e.g., spending time talking to the child) and provides more emotional support for

the child (e.g., supporting the child when he or she is facing difficulties at school), the child tends to perform better (**Figure 7**).

The survey has also collected data concerning other educational processes such as teaching strategies and school climate. These will be further studied and reported.

Initiated by OECD, PISA is a regular international study, with the aim of comparing and evaluating the effectiveness of education systems of the participating countries and economies by assessing how well 15-year-olds have acquired the knowledge and skills essential for participation in society. The assessment is conducted every three years.

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Figure 1-7 and Appendix 1,2

Figure 1: Comparison of Hong Kong Students’ Performance in Science, Reading and Mathematics in PISA from 2000+ to 2015

Cycle	Science		Reading		Mathematics	
	Mean	S.E.	Mean	S.E.	Mean	S.E.
2000+ ^Δ	541	3.0	525	2.9	560	3.3
2003	539	4.3	510	3.7	550	4.5
2006	542	2.5	536	2.4	547	2.7
2009	549	2.8	533	2.1	555	2.7
2012	555	2.6	545	2.8	561	3.2
2015	523 [#]	2.5	527 ^{##}	2.7	548 ^{###}	3.0

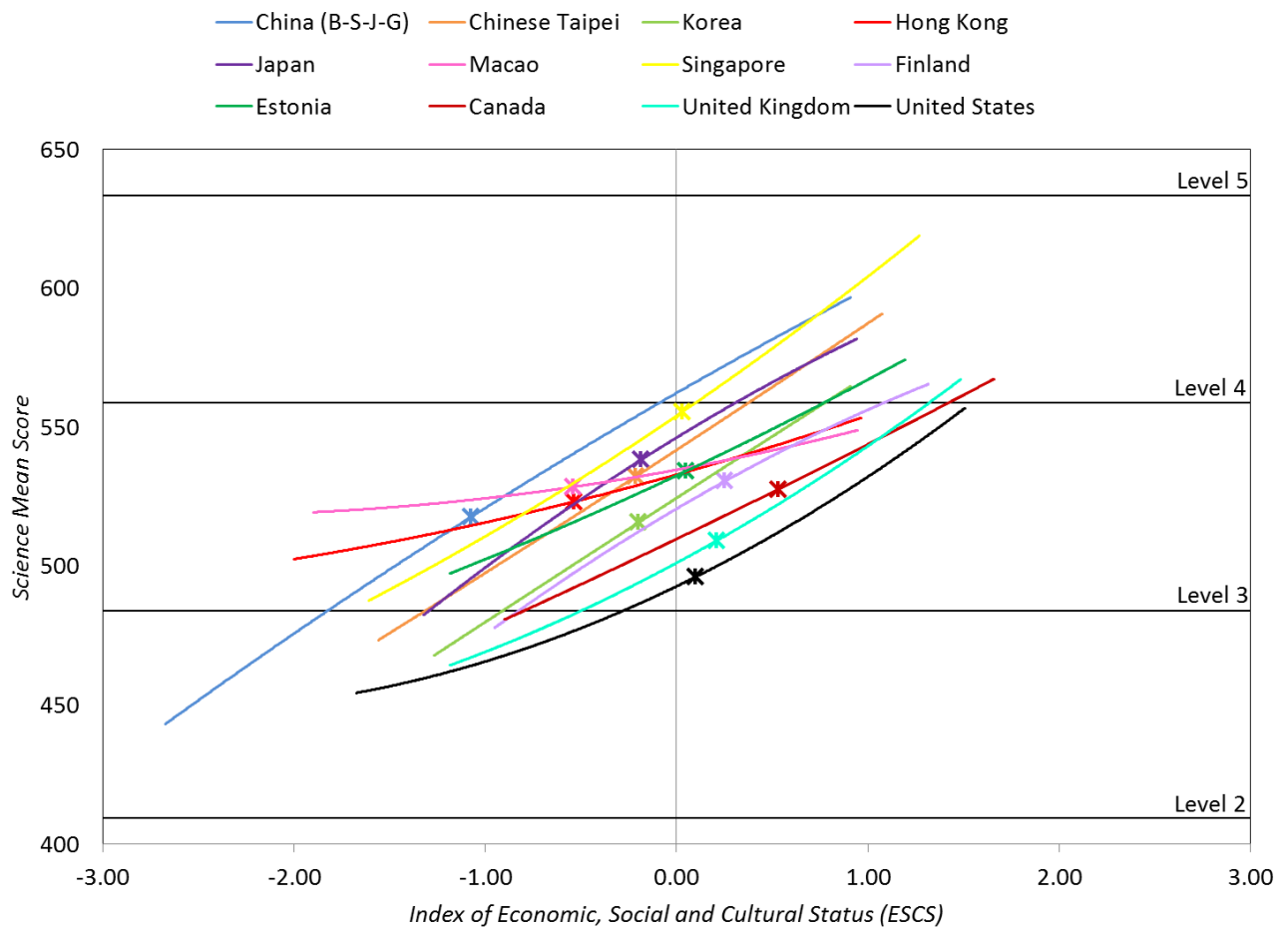
indicates significant differences in Science performance between 2015 and 2012, 2015 and 2009, 2015 and 2006.

indicates significant differences in Reading performance between 2015 and 2012, 2015 and 2003.

indicates significant difference in Mathematics performance between 2015 and 2012.

Δ Note: PISA 2000+ was administered in 2002.

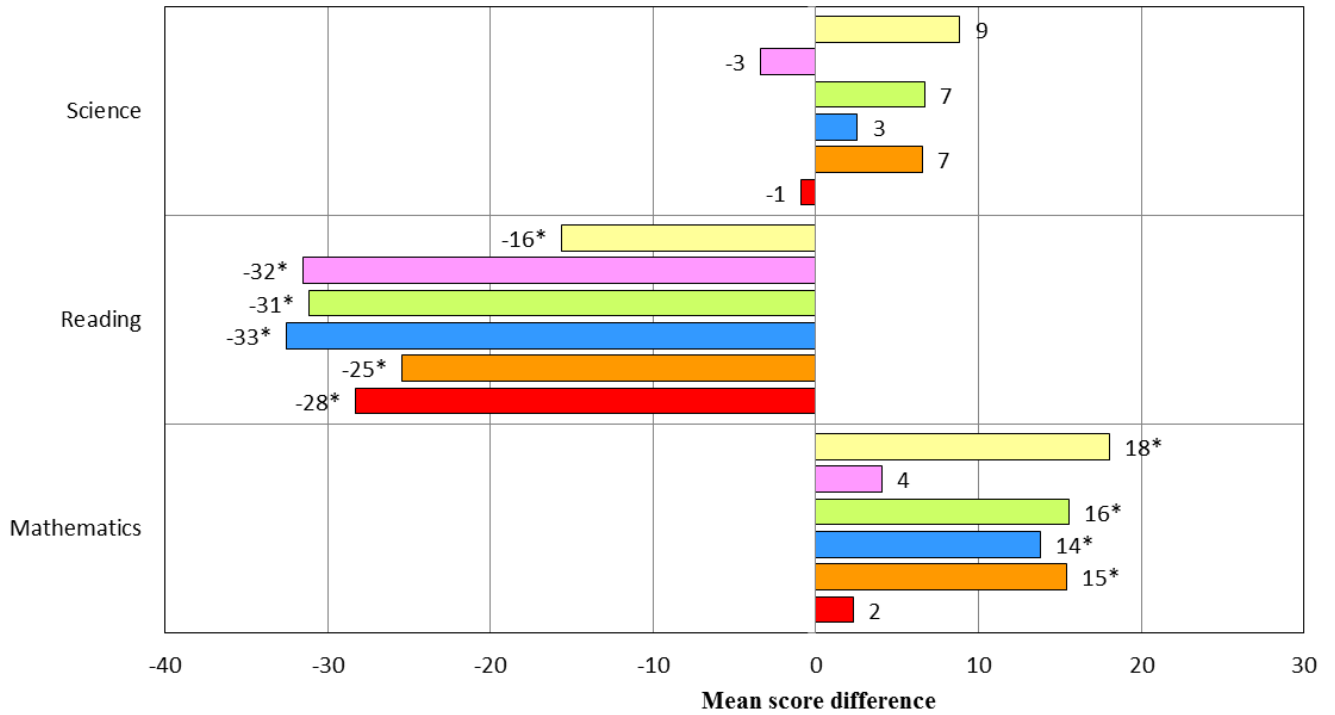
Figure 2: Relationship between Student Performance in Science and ESCS in Twelve Countries/Economies



Note: The four participating regions of Mainland China are Beijing, Shanghai, Jiangsu, and Guangdong.

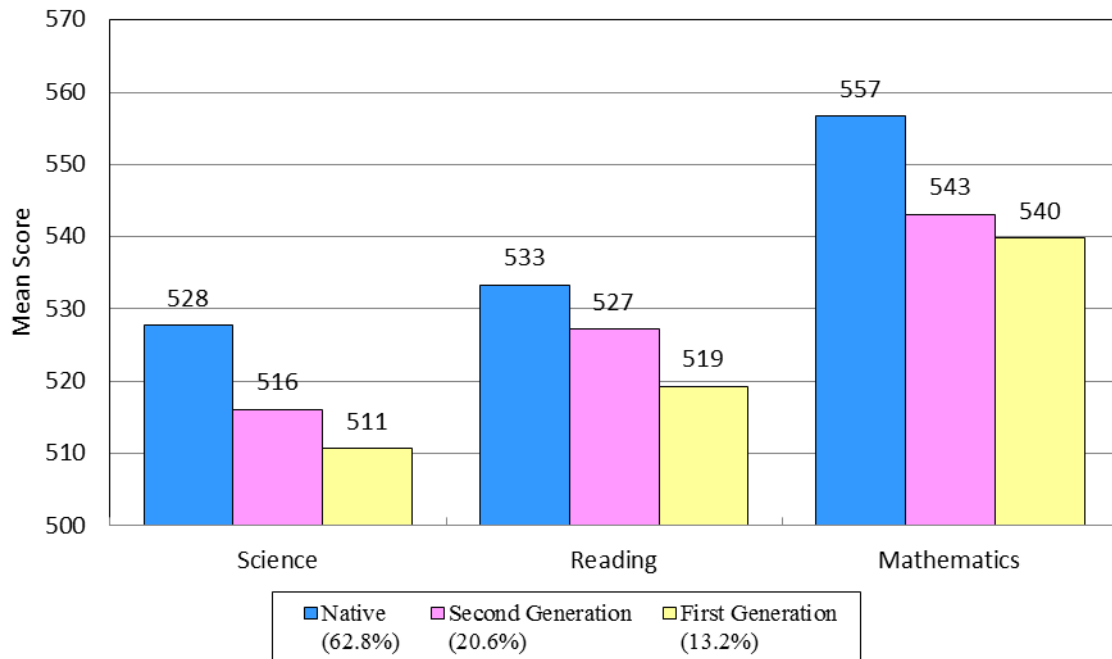
Figure 3: Gender Differences in Scientific, Reading and Mathematical Literacy in PISA in Hong Kong from 2000+ to 2015

HKPISA2000+ HKPISA2003 HKPISA2006 HKPISA2009 HKPISA2012 HKPISA2015



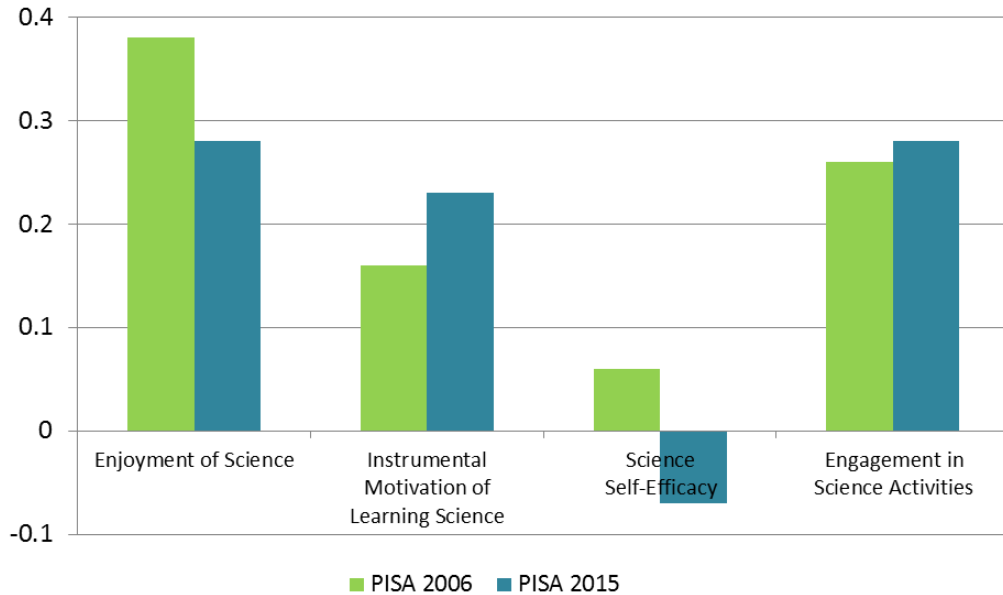
Girls perform better ← ————— → Boys perform better
 * indicates that the values are statistically significant

Figure 4: PISA 2015 Literacy Performance of Hong Kong Students by Immigrant Status^Δ



^Δ Note: Figures in parentheses indicate the percentages of students of different immigrant statuses.

Figure 5: Indices of Self-related Cognition and Engagement in Science Activities of Hong Kong Students in PISA 2015



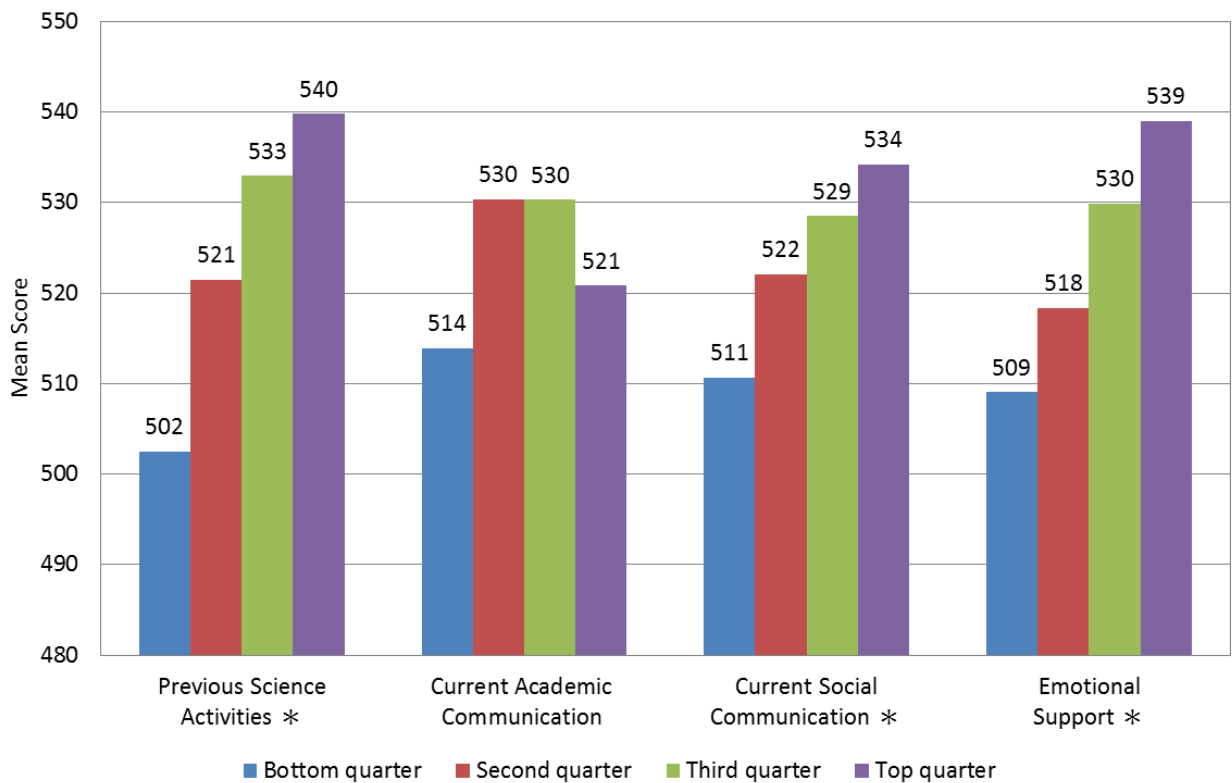
Note: OECD averages of the indices are set at 0.00.

Figure 6: Relationship between Students' Self-related Cognition, Engagement in Science Activities and Scientific Literacy Performance



Note: * indicates significant correlations between self-related cognition, engagement in science activities and Science performance.

Figure 7: Relationship between Parental Factors and Students' Scientific Literacy Performance



Note: * indicates significant correlations between parental factors and students' Science performance.

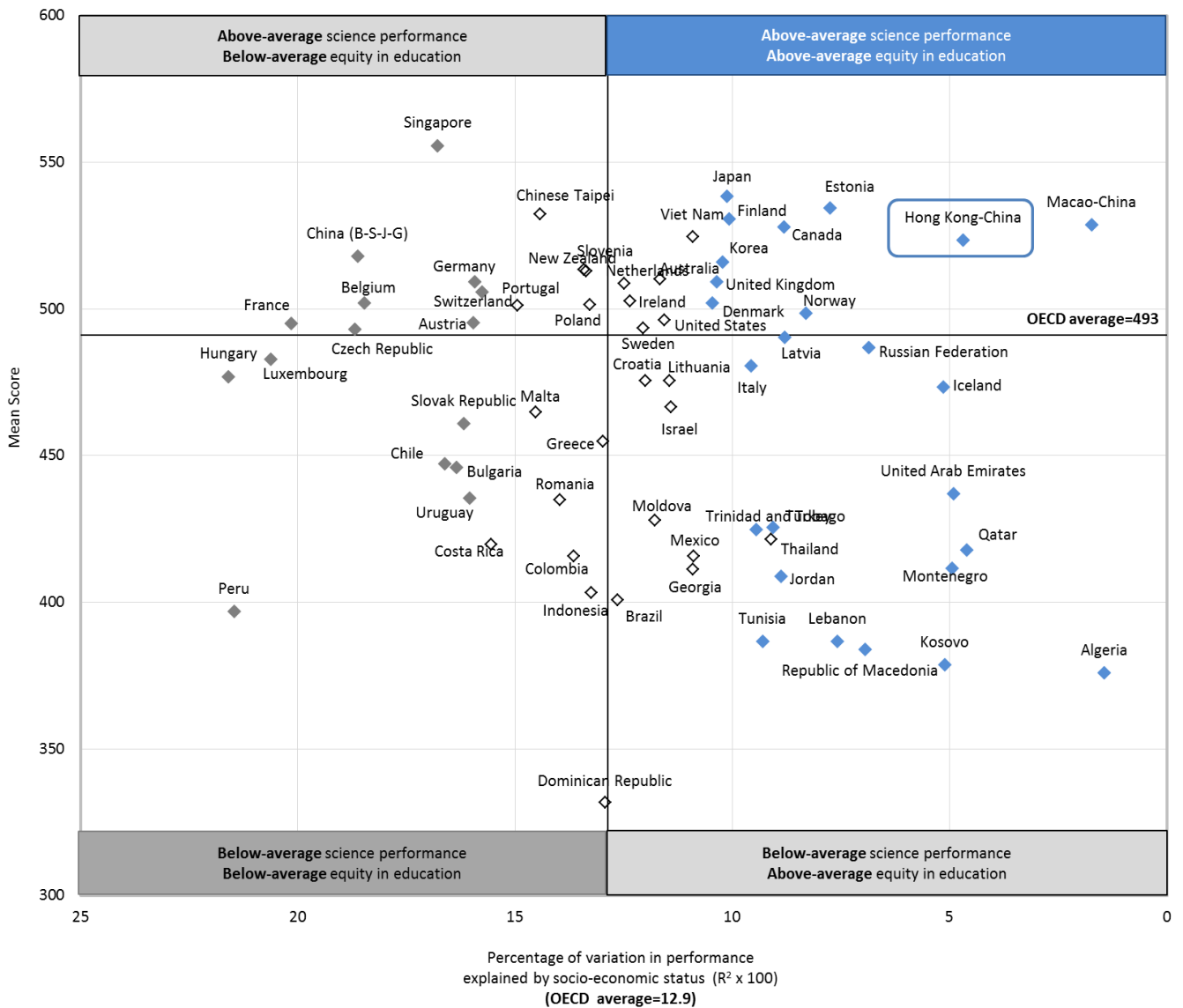
Appendix 1: Performance of 15-Year-Old Students in Scientific, Reading and Mathematical Literacy in PISA 2015

Science			Reading			Mathematics		
Countries/Economies	Mean	S.E.	Countries/Economies	Mean	S.E.	Countries/Economies	Mean	S.E.
Singapore	556	(1.2)	Singapore	535	(1.6)	Singapore	564	(1.5)
Japan	538	(3.0)	Hong Kong-China	527	(2.7)	Hong Kong-China	548	(3.0)
Estonia	534	(2.1)	Canada	527	(2.3)	Macao-China	544	(1.1)
Chinese Taipei	532	(2.7)	Finland	526	(2.5)	Chinese Taipei	542	(3.0)
Finland	531	(2.4)	Ireland	521	(2.5)	Japan	532	(3.0)
Macao-China	529	(1.1)	Estonia	519	(2.2)	China (B-S-J-G)	531	(4.9)
Canada	528	(2.1)	Korea	517	(3.5)	Korea	524	(3.7)
Viet Nam	525	(3.9)	Japan	516	(3.2)	Switzerland	521	(2.9)
Hong Kong-China	523	(2.5)	Norway	513	(2.5)	Estonia	520	(2.0)
China (B-S-J-G)	518	(4.6)	New Zealand	509	(2.4)	Canada	516	(2.3)
Korea	516	(3.1)	Germany	509	(3.0)	Netherlands	512	(2.2)
New Zealand	513	(2.4)	Macao-China	509	(1.3)	Denmark	511	(2.2)
Slovenia	513	(1.3)	Poland	506	(2.5)	Finland	511	(2.3)
Australia	510	(1.5)	Slovenia	505	(1.5)	Slovenia	510	(1.3)
United Kingdom	509	(2.6)	Netherlands	503	(2.4)	Belgium	507	(2.4)
Germany	509	(2.7)	Australia	503	(1.7)	Germany	506	(2.9)
Netherlands	509	(2.3)	Sweden	500	(3.5)	Poland	504	(2.4)
Switzerland	506	(2.9)	Denmark	500	(2.5)	Ireland	504	(2.1)
Ireland	503	(2.4)	France	499	(2.5)	Norway	502	(2.2)
Belgium	502	(2.3)	Belgium	499	(2.4)	Austria	497	(2.9)
Denmark	502	(2.4)	Portugal	498	(2.7)	New Zealand	495	(2.3)
Poland	501	(2.5)	United Kingdom	498	(2.8)	Viet Nam	495	(4.5)
Portugal	501	(2.4)	Chinese Taipei	497	(2.5)	Russian Federation	494	(3.1)
Norway	498	(2.3)	United States	497	(3.4)	Sweden	494	(3.2)
United States	496	(3.2)	Spain	496	(2.4)	Australia	494	(1.6)
Austria	495	(2.4)	Russian Federation	495	(3.1)	France	493	(2.1)
France	495	(2.1)	China (B-S-J-G)	494	(5.1)	United Kingdom	492	(2.5)
Sweden	493	(3.6)	Switzerland	492	(3.0)	Czech Republic	492	(2.4)
Czech Republic	493	(2.3)	Latvia	488	(1.8)	Portugal	492	(2.5)
Spain	493	(2.1)	Czech Republic	487	(2.6)	Italy	490	(2.8)
Latvia	490	(1.6)	Croatia	487	(2.7)	Iceland	488	(2.0)
Russian Federation	487	(2.9)	Viet Nam	487	(3.7)	Spain	486	(2.2)
Luxembourg	483	(1.1)	Austria	485	(2.8)	Luxembourg	486	(1.3)
Italy	481	(2.5)	Italy	485	(2.7)	Latvia	482	(1.9)
Hungary	477	(2.4)	Iceland	482	(2.0)	Malta	479	(1.7)
Lithuania	475	(2.7)	Luxembourg	481	(1.4)	Lithuania	478	(2.3)
Croatia	475	(2.5)	Israel	479	(3.8)	Hungary	477	(2.5)
Iceland	473	(1.7)	Lithuania	472	(2.7)	Slovak Republic	475	(2.7)
Israel	467	(3.4)	Hungary	470	(2.7)	Israel	470	(3.6)
Malta	465	(1.6)	Greece	467	(4.3)	United States	470	(3.2)
Slovak Republic	461	(2.6)	Chile	459	(2.6)	Croatia	464	(2.8)
Kazakhstan	456	(3.7)	Slovak Republic	453	(2.8)	Kazakhstan	460	(4.3)
Greece	455	(3.9)	Malta	447	(1.8)	Greece	454	(3.8)
Chile	447	(2.4)	Cyprus	443	(1.7)	Malaysia	446	(3.3)
Bulgaria	446	(4.4)	Uruguay	437	(2.5)	Romania	444	(3.8)
Malaysia	443	(3.0)	Romania	434	(4.1)	Bulgaria	441	(4.0)
United Arab Emirates	437	(2.4)	United Arab Emirates	434	(2.9)	Cyprus	437	(1.7)
Uruguay	435	(2.2)	Bulgaria	432	(5.0)	United Arab Emirates	427	(2.4)
Romania	435	(3.2)	Malaysia	431	(3.5)	Chile	423	(2.5)
Cyprus	433	(1.4)	Turkey	428	(4.0)	Turkey	420	(4.1)
Argentina	432	(2.9)	Costa Rica	427	(2.6)	Moldova	420	(2.5)
Moldova	428	(2.0)	Trinidad and Tobago	427	(1.5)	Uruguay	418	(2.5)
Albania	427	(3.3)	Kazakhstan	427	(3.4)	Montenegro	418	(1.5)
Turkey	425	(3.9)	Montenegro	427	(1.6)	Trinidad and Tobago	417	(1.4)
Trinidad and Tobago	425	(1.4)	Argentina	425	(3.2)	Thailand	415	(3.0)
Thailand	421	(2.8)	Colombia	425	(2.9)	Albania	413	(3.4)
Costa Rica	420	(2.1)	Mexico	423	(2.6)	Argentina	409	(3.1)
Qatar	418	(1.0)	Moldova	416	(2.5)	Mexico	408	(2.2)
Colombia	416	(2.4)	Thailand	409	(3.3)	Georgia	404	(2.8)
Mexico	416	(2.1)	Jordan	408	(2.9)	Qatar	402	(1.3)
Montenegro	411	(1.0)	Brazil	407	(2.8)	Costa Rica	400	(2.5)
Georgia	411	(2.4)	Albania	405	(4.1)	Lebanon	396	(3.7)
Jordan	409	(2.7)	Qatar	402	(1.0)	Colombia	390	(2.3)
Indonesia	403	(2.6)	Georgia	401	(3.0)	Peru	387	(2.7)
Brazil	401	(2.3)	Peru	398	(2.9)	Indonesia	386	(3.1)
Peru	397	(2.4)	Indonesia	397	(2.9)	Jordan	380	(2.7)
Lebanon	386	(3.4)	Tunisia	361	(3.1)	Brazil	377	(2.9)
Tunisia	386	(2.1)	Dominican Republic	358	(3.1)	Republic of Macedonia	371	(1.3)
Republic of Macedonia	384	(1.2)	Republic of Macedonia	352	(1.4)	Tunisia	367	(3.0)
Kosovo	378	(1.7)	Algeria	350	(3.0)	Kosovo	362	(1.6)
Algeria	376	(2.6)	Kosovo	347	(1.6)	Algeria	360	(3.0)
Dominican Republic	332	(2.6)	Lebanon	347	(4.4)	Dominican Republic	328	(2.7)
<i>OECD Average</i>	493	(0.4)	<i>OECD Average</i>	493	(0.5)	<i>OECD Average</i>	490	(0.4)

Note: Shaded area indicates scores significantly different from those of Hong Kong. The four participating regions of Mainland China are Beijing, Shanghai, Jiangsu, and Guangdong.

Appendix 2: Performance in Science and the Impact of Socio-economic Background

- ◆ Strength of the relationship between performance and socio-economic status is above the OECD average
- ◇ Strength of the relationship between performance and socio-economic status is not statistically significantly different from the OECD average
- ◆ Strength of the relationship between performance and socio-economic status is below the OECD average



Note: The four participating regions of Mainland China are Beijing, Shanghai, Jiangsu, and Guangdong.