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CHEITA Benchmarking Project

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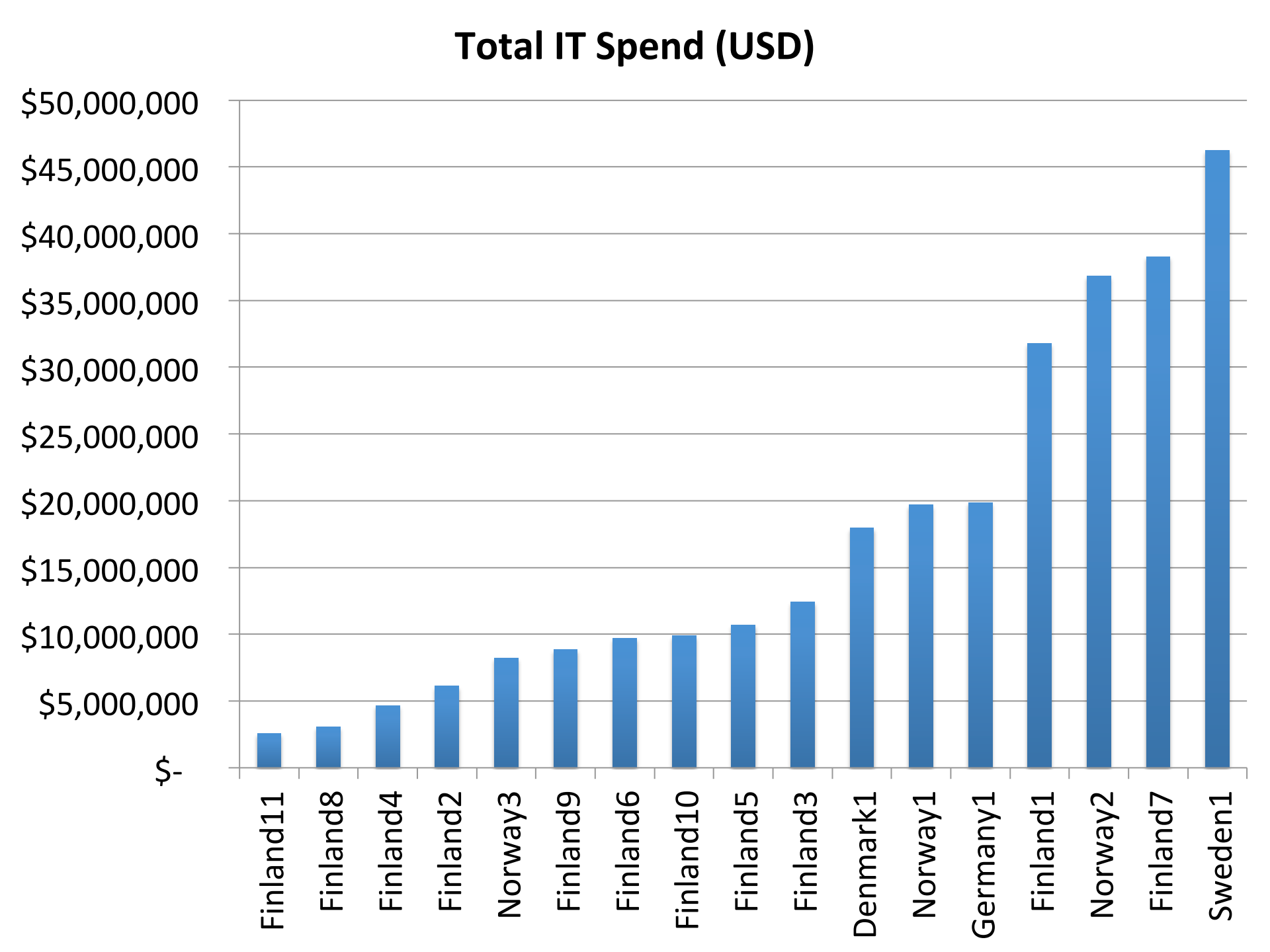
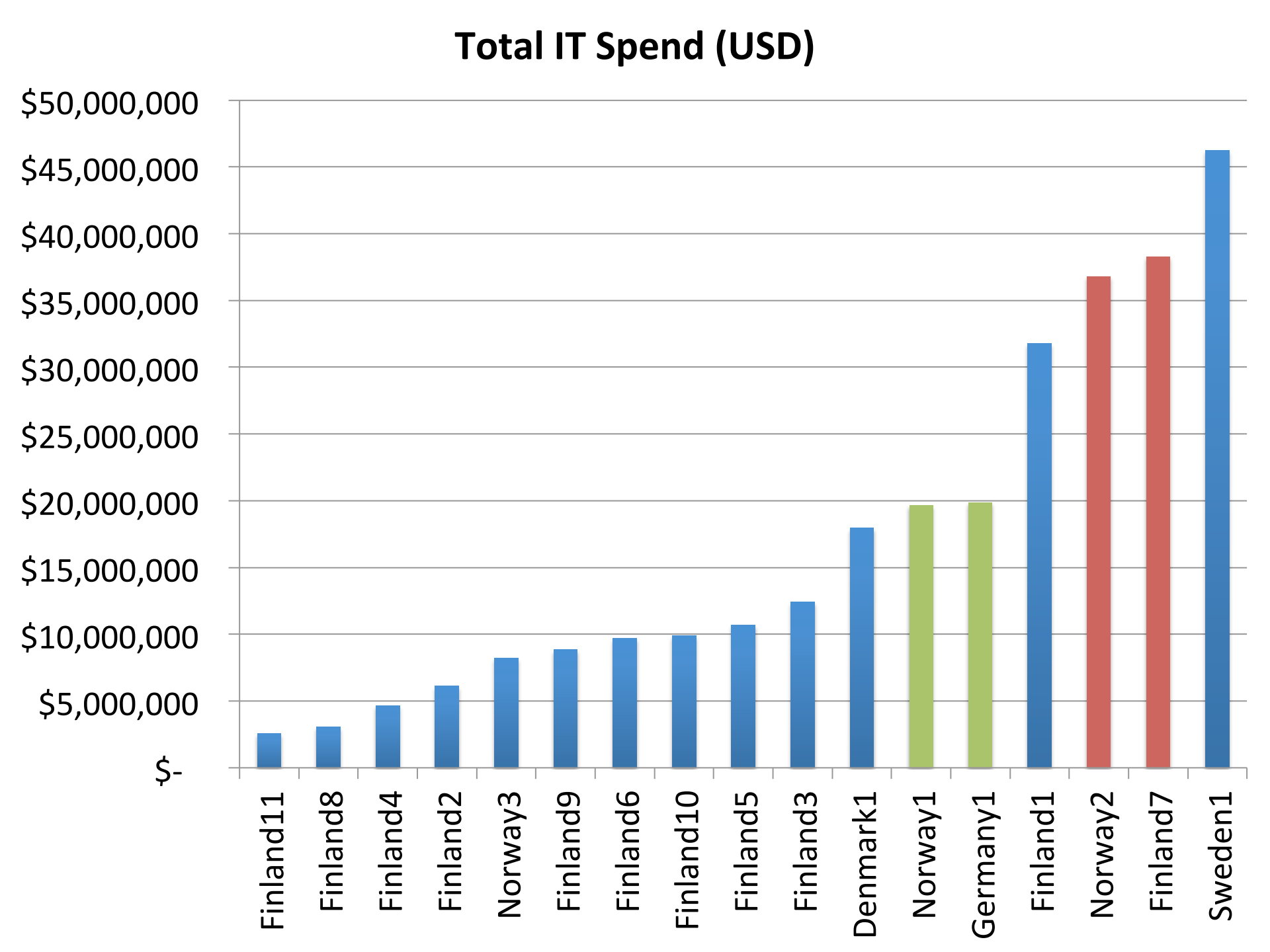
Why is the Complexity Index needed?


Total IT Spend (USD)
$50,000,000
$45,000,000
$40,000,000
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$-
Finland11
Finland8
Finland4
Finland2
Norway3
Finland9
Finland6
Finland10
Finland5
Finland3
Denmark1
Norway1
Germany1
Finland1
Norway2
Finland7
Sweden1

How does the Complexity Index facilitate comparisons?


Total IT Spend (USD)
$50,000,000
$45,000,000
$40,000,000
$35,000,000
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$15,000,000
$10,000,000
$5,000,000
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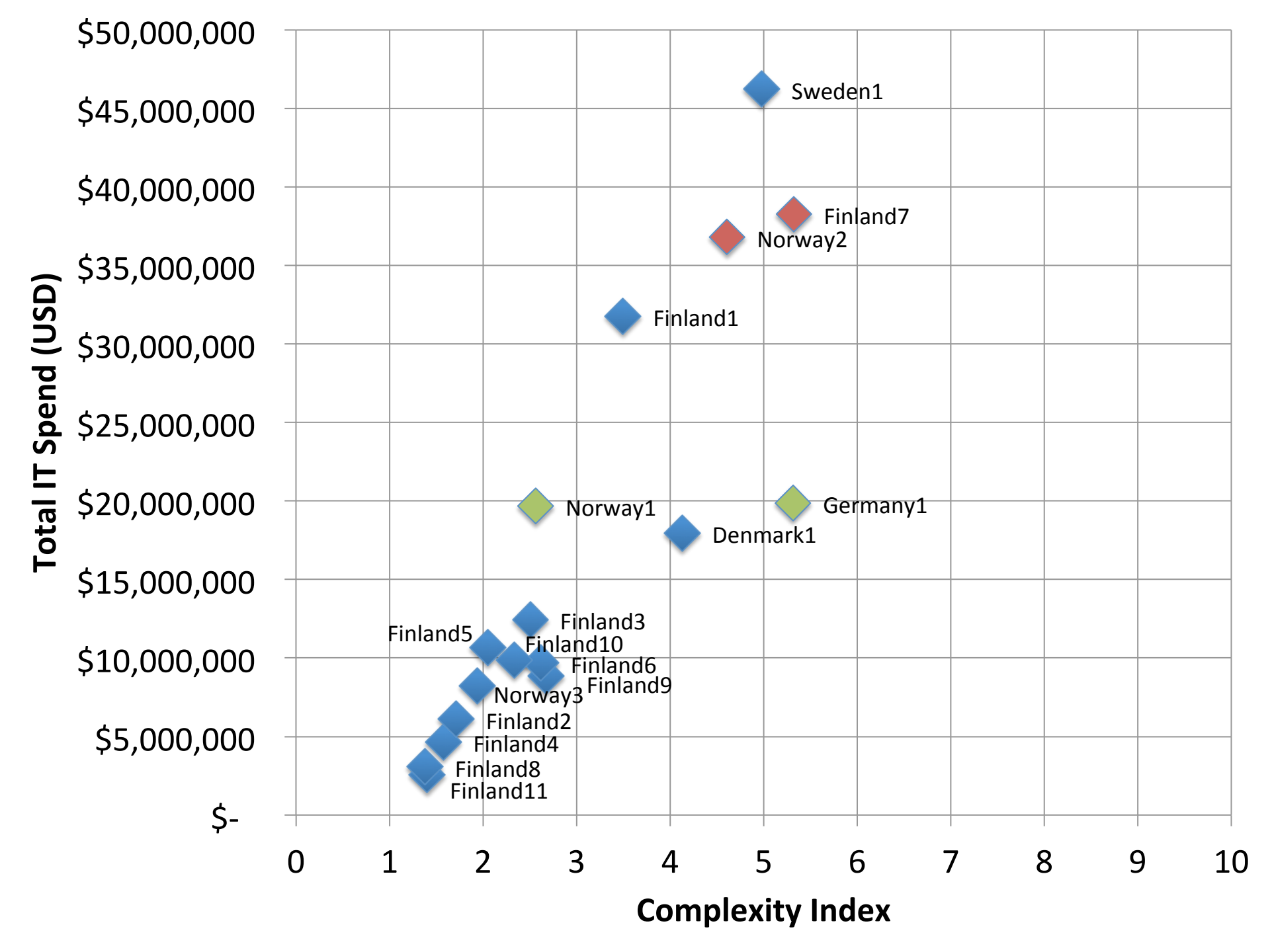
Finland11
Finland8
Finland4
Finland2
Norway3
Finland9
Finland6
Finland10
Finland5
Finland3
Denmark1
Norway1
Germany1
Finland1
Norway2
Finland7
Sweden1


$50,000,000
$45,000,000
$40,000,000
$35,000,000
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$10,000,000
$5,000,000
$-
Total IT Spend (USD)
0
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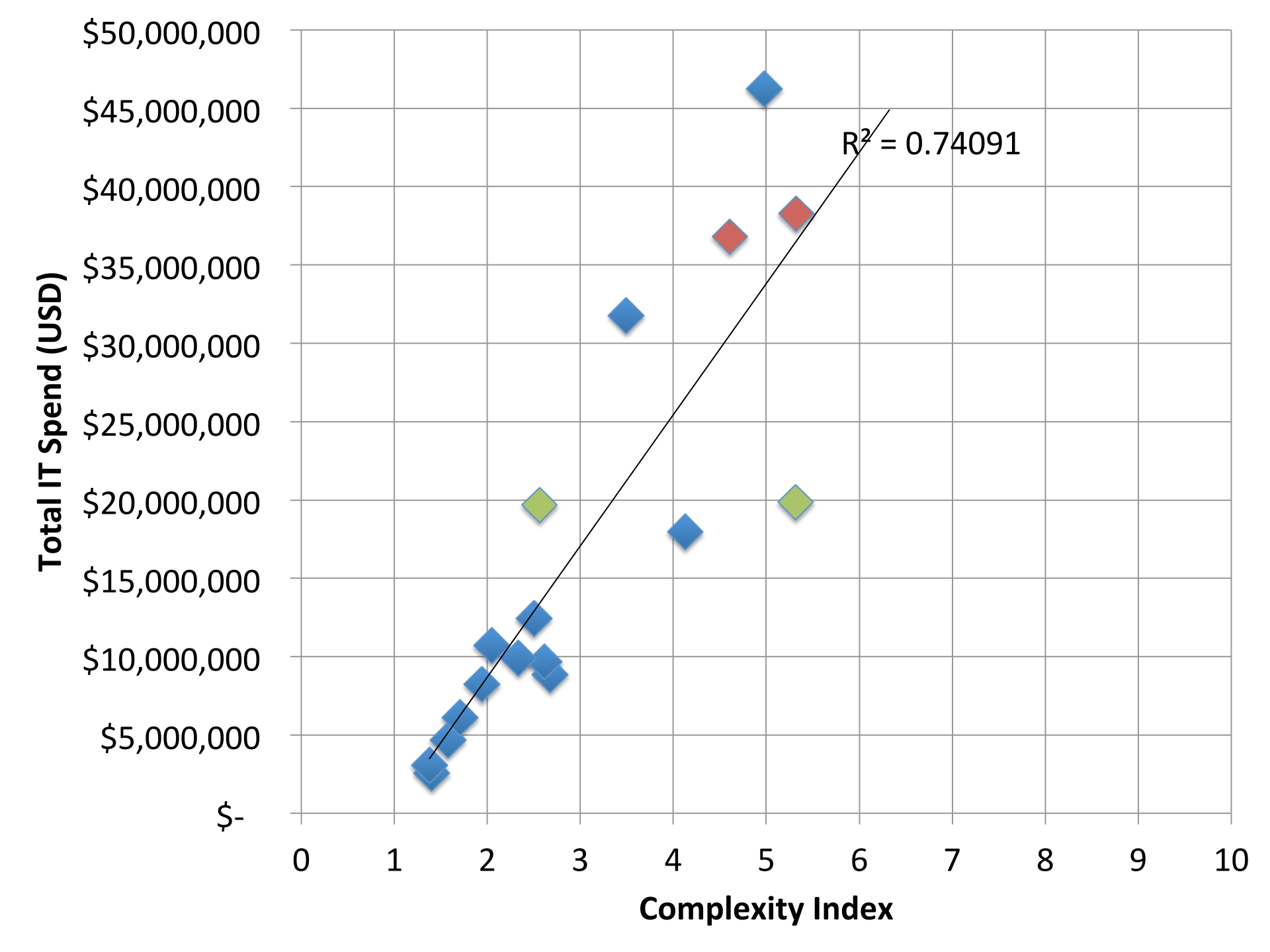
Complexity Index
Sweden1
Finland7
Norway2
Finland1
Norway1
Germany1
Denmark1
Finland3
Finland5
Finland10
Finland6
Finland9
Norway3
Finland2
Finland4
Finland8
Finland11


$50,000,000
$45,000,000
$40,000,000
$35,000,000
$30,000,000
$25,000,000
$20,000,000
$15,000,000
$10,000,000
$5,000,000
$-
Total IT Spend (USD)
R² = 0.74091
0
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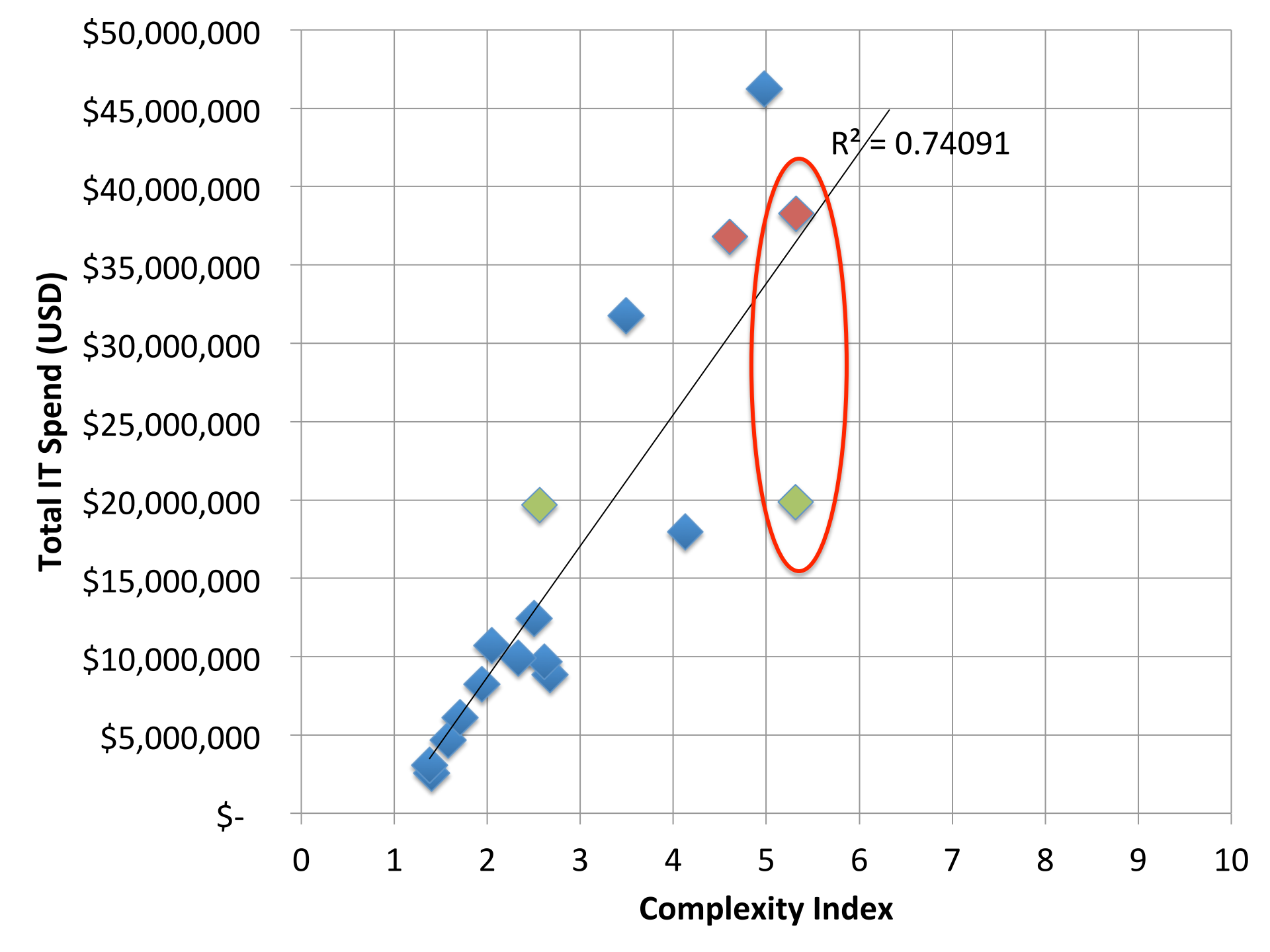
Complexity Index


$50,000,000
$45,000,000
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$35,000,000
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$15,000,000
$10,000,000
$5,000,000
$-
Total IT Spend (USD)
R² = 0.74091
0
1
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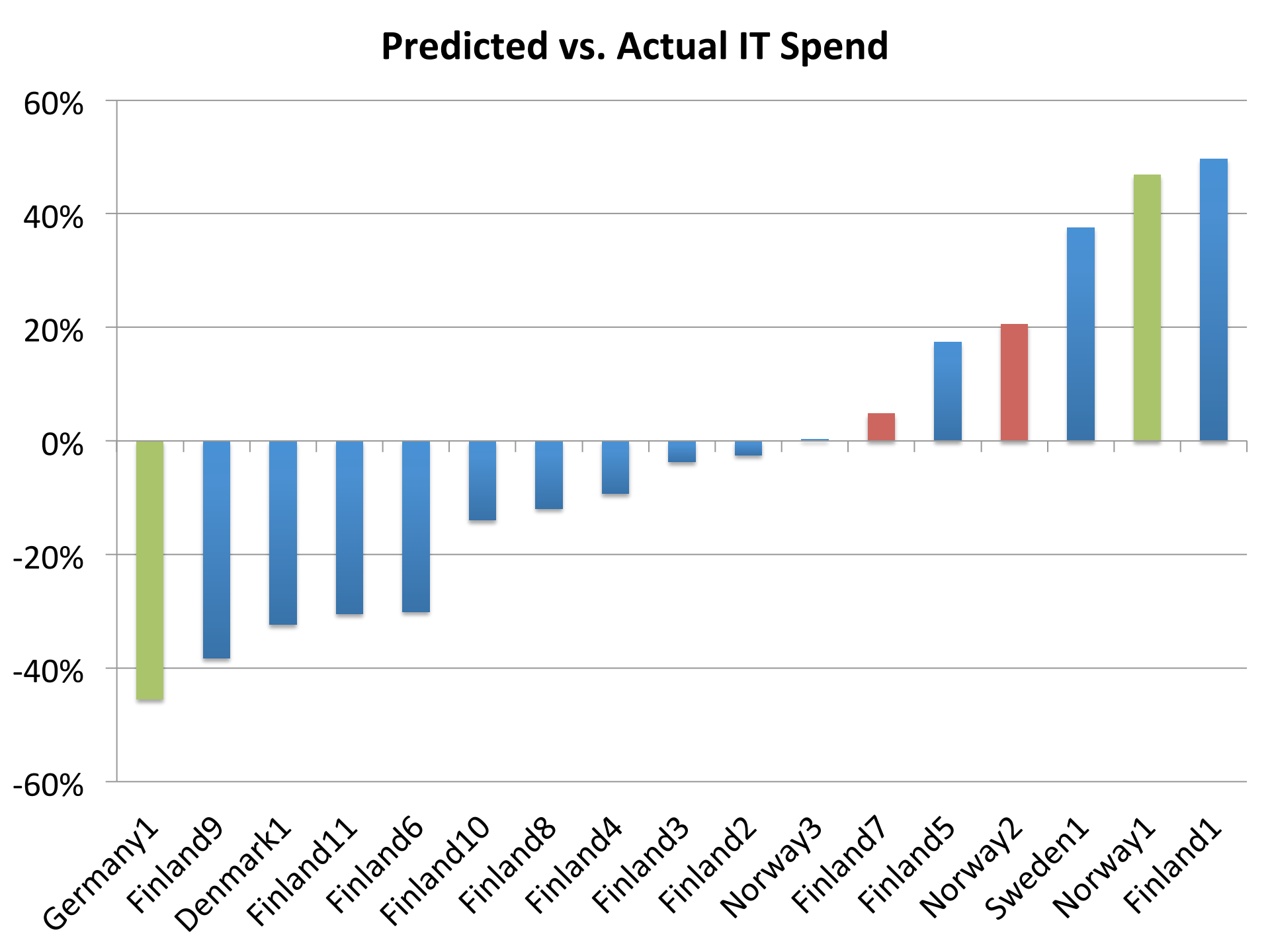
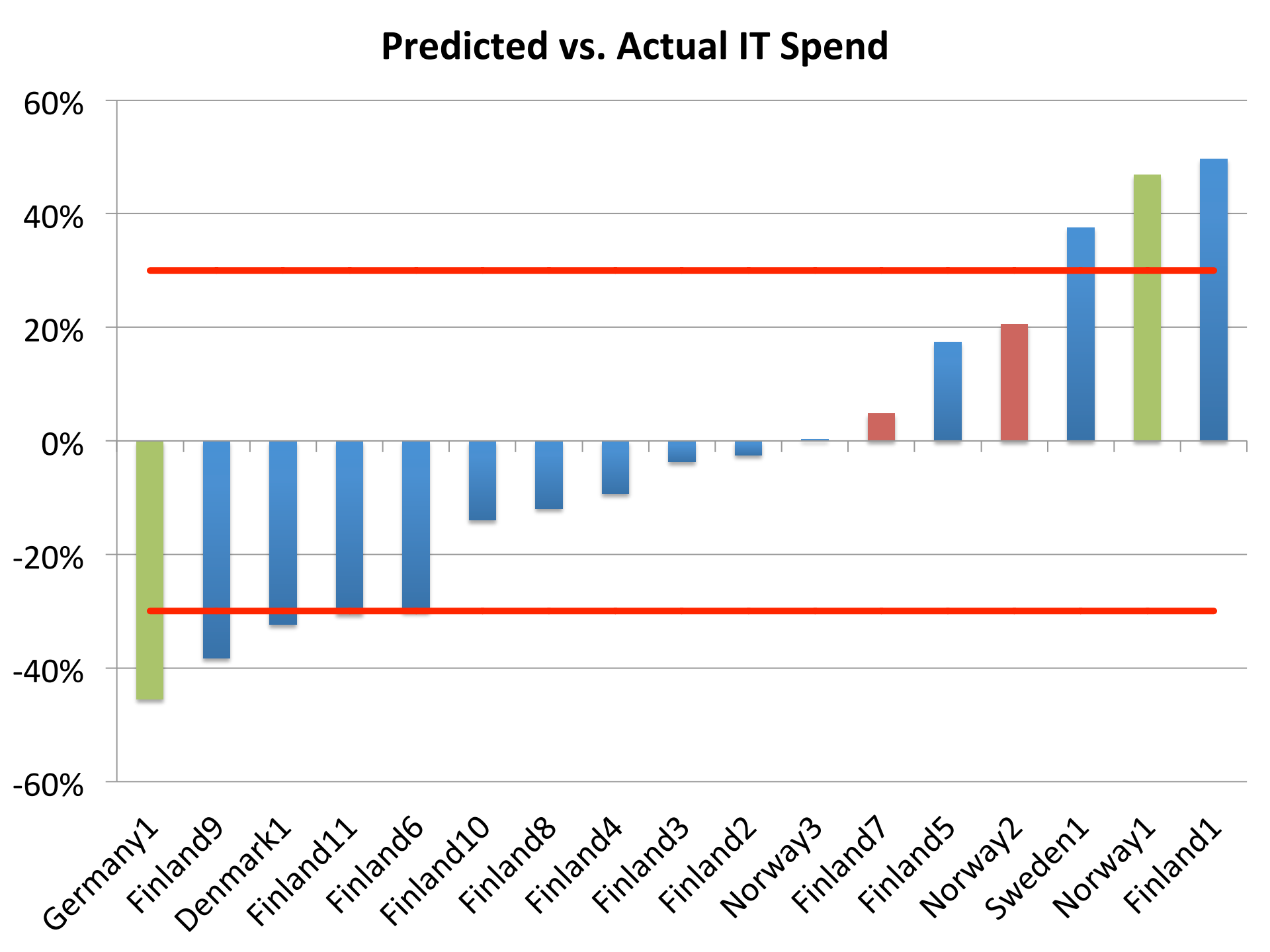
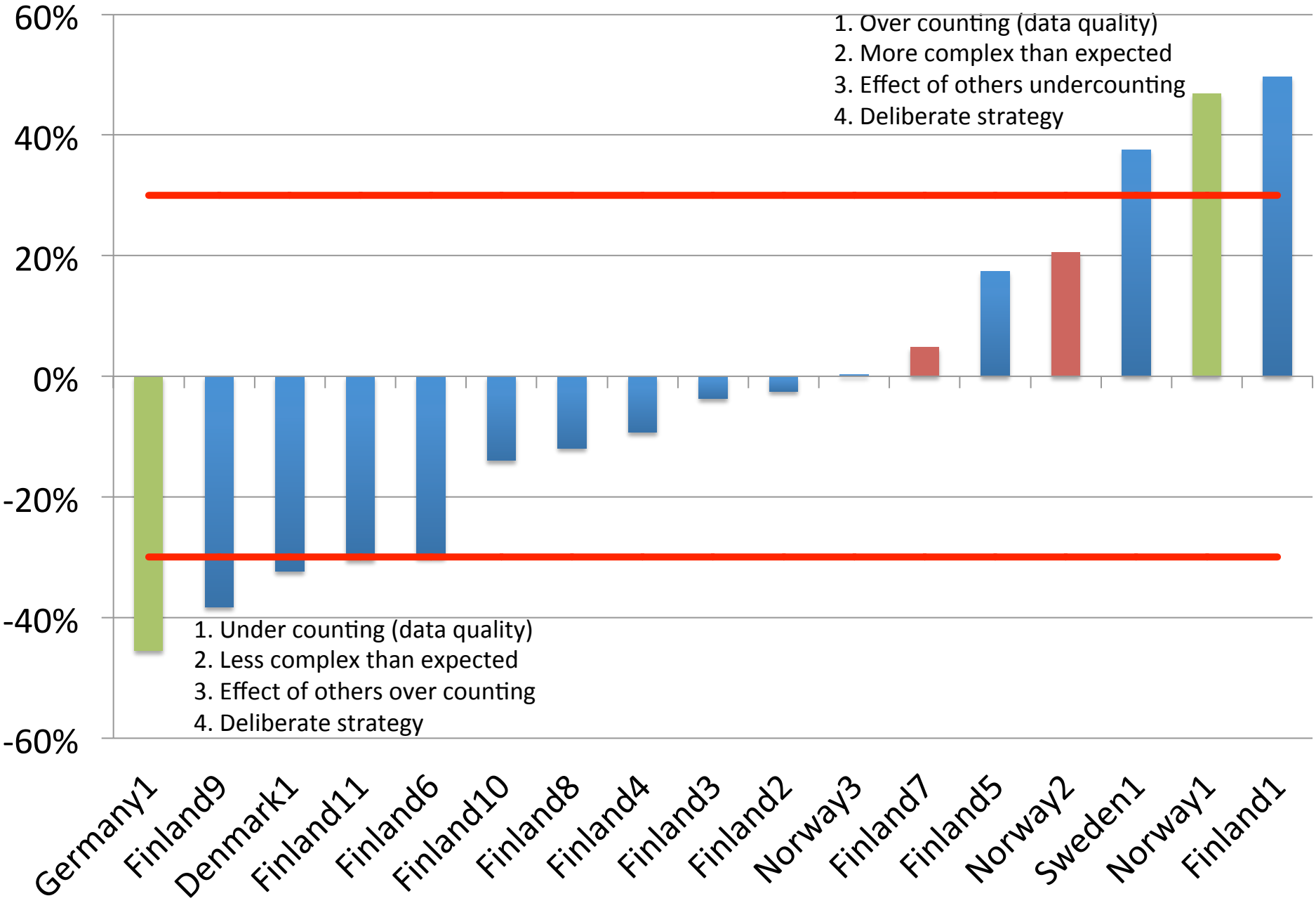
10
Complexity Index

How can the Complexity Index be used to identify outliers?


Predicted vs. Actual IT Spend
60%
40%
20%
0%
-20%
-40%
-60%
Germany1
Finland9
Denmark1
Finland11
Finland6
Finland10
Finland8
Finland4
Finland3
Finland2
Norway3
Finland7
Finland5
Norway2
Sweden1
Norway1
Finland1


Predicted vs. Actual IT Spend
60%
40%
20%
0%
-20%
-40%
-60%
Germany1
Finland9
Denmark1
Finland11
Finland6
Finland10
Finland8
Finland4
Finland3
Finland2
Norway3
Finland7
Finland5
Norway2
Sweden1
Norway1
Finland1

Predicted vs. Actual IT Spend



How is the Complexity Index calculated?

The complexity index has three components based on the following data:

1. Number of students (EFTSL)
2. Number of staff (FTE)
3. Research income ($)

The complexity index is calculated by:

1. Obtaining the raw measurement
2. Scaling the raw measurement (using a linear algorithm) between 1 and 10 based on the max and min values for the sector
3. Applying a weighting to the scaled measurement based on the relative importance of the underlying measure (35% for students, 35% for staff, and 30% for research income).
4. Adding up the 3 weighted measurements to get the final result

An Example (University R)

1. Student EFT=21,378
2. Using max = 40,429 (University N) and min = 402 (University B) University R's scaled student measurement becomes 5.61. University N = 10 and University B =1.
3. Weighted student measurement is 35% of 5.61 = 1.97.
4. Adding this to the weighted measurements for research (0.86) and staff (1.41) gives a total of 4.24

What is the CHEITA Benchmarking Project?

CHEITA Benchmarking group members

Organization	Name	Title
Council of Australian University Directors of Information Technology (CAUDIT)	Paul Sherlock	CIO, University of South Australia
Cineca	Michele Mennielli	External Relations and International Affairs Manager
Canadian University Council of Chief Information Officers (CUCCIO)	Lori MacMullen	Executive Director
EDUCAUSE	Leah Lang	Manager, Core Data Service
	Karen Wetzel	Program Manager, ECAR Working Groups
	Eden Dahlstrom	Director of Research
EUNIS	Johan Bergström	Head of International Cooperation
	Pekka Kähkipuro	Director of IT, Aalto University
	Ilkka Siissalo	CIO and Director of Information Technology, University of Helsinki
	Teemu Seesto	IT secretary of FUCIO Network of Finnish Universities' Chief IT Officers
UCISA	Peter Tinson	Executive Director
Zentren fur Kommunikation und Informationsverarbeitung e.V. (ZKI)	Reiner Schmidt	CIO, Hochschule Ansbach
	Markus von der Heyde	Management Representative

Goals of the CHEITA Benchmarking Project

- Determine a way to find international peer institutions.
  - Explore whether the Complexity Index can help compare institutions internationally (In progress).
  - Develop international Complexity Index for benchmarking.
- Develop a small set of metrics which can be used to benchmark internationally.

235 data points from 11 countries

- Australia
- Canada
- Denmark
- Finland
- Germany
- Norway
- New Zealand
- Sweden
- South Africa
- UK
- US

Normalized financial data to USD using Purchasing Power Parity

Calculating the CHEITA Complexity Index

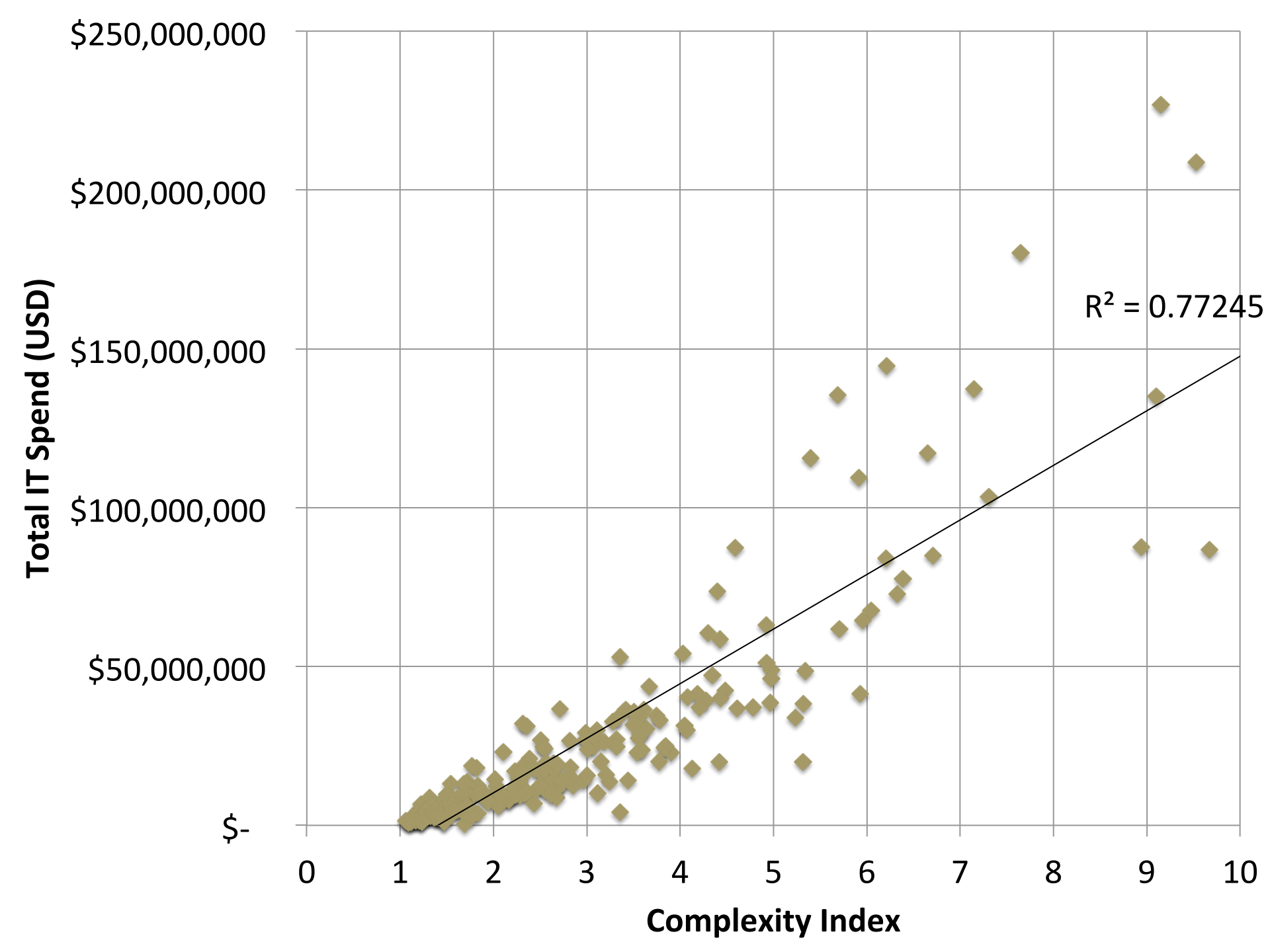
	Min	Max
Number of students (EFTSL)	0	45,000
Number of staff (FTE)	0	18,000
Research income ($)	0	$750,000,000

eftsl_ind = min(10,1+9*(student FTE/45,000))

fte_ind = min(10,1+9*(staff FTE/18,000))

res_ind = min(10,1+9*(research income/750,000,000))

comp_ind = eftsl_ind*.35 + fte_ind*.35 + res_ind*.30


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
R² = 0.77245
0
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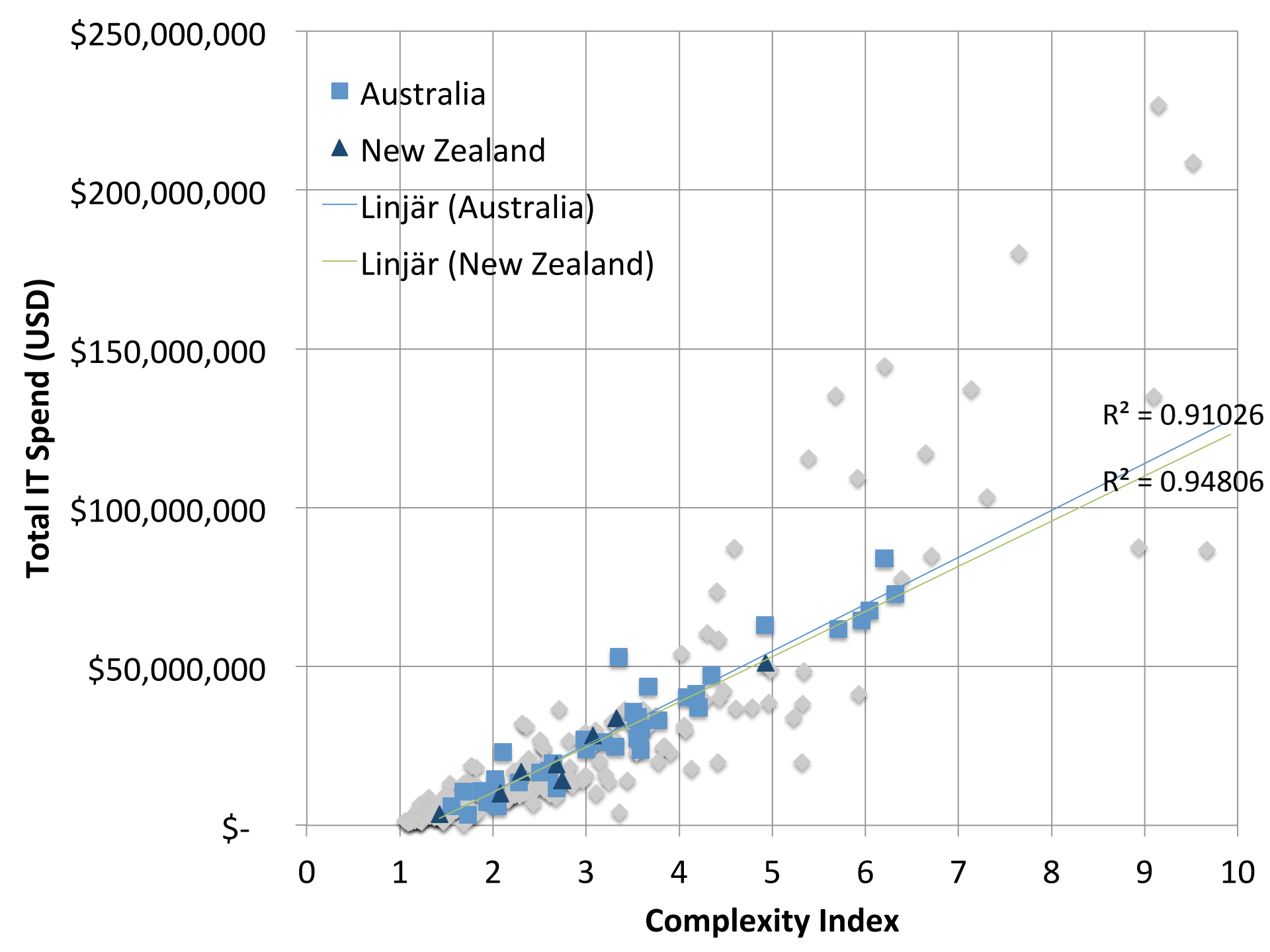
Complexity Index


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
Australia
New Zealand
Linjär (Australia)
Linjär (New Zealand)
R² = 0.91026
R² = 0.94806
0
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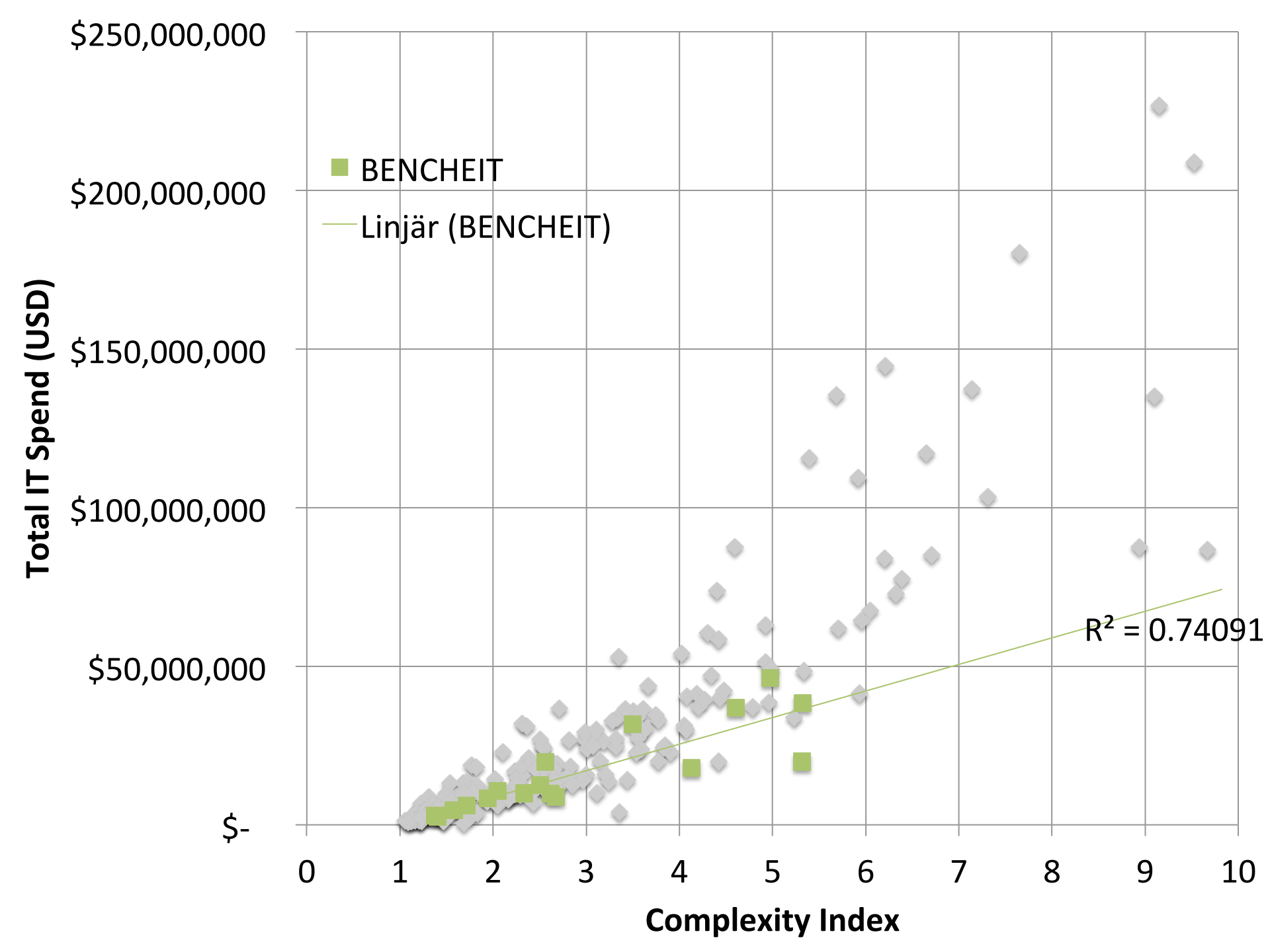
Complexity Index


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
BENCHEIT
Linjär (BENCHEIT)
R² = 0.74091
0
1
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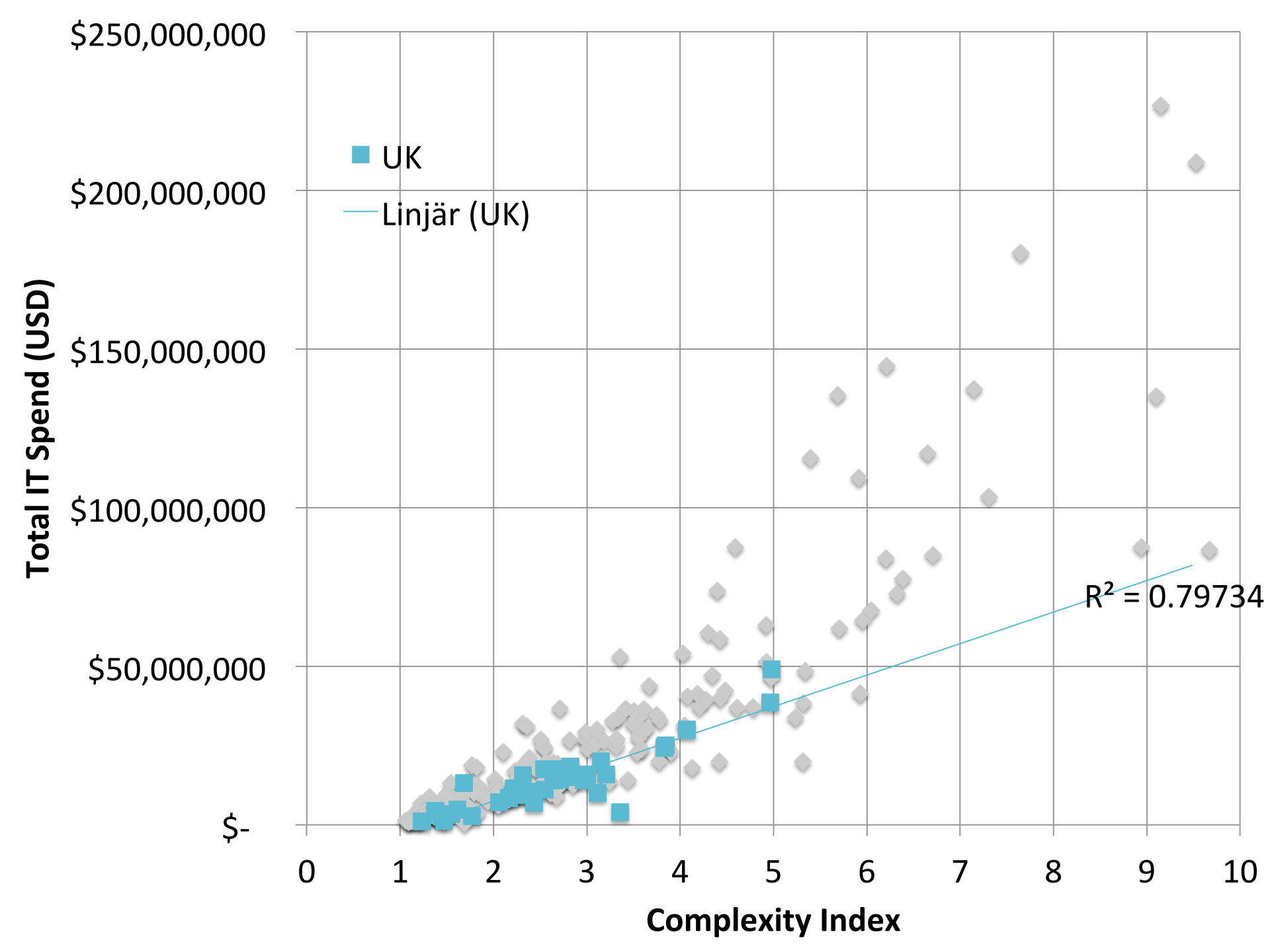
Complexity Index


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
UK
Linjär (UK)
R² = 0.79734
0
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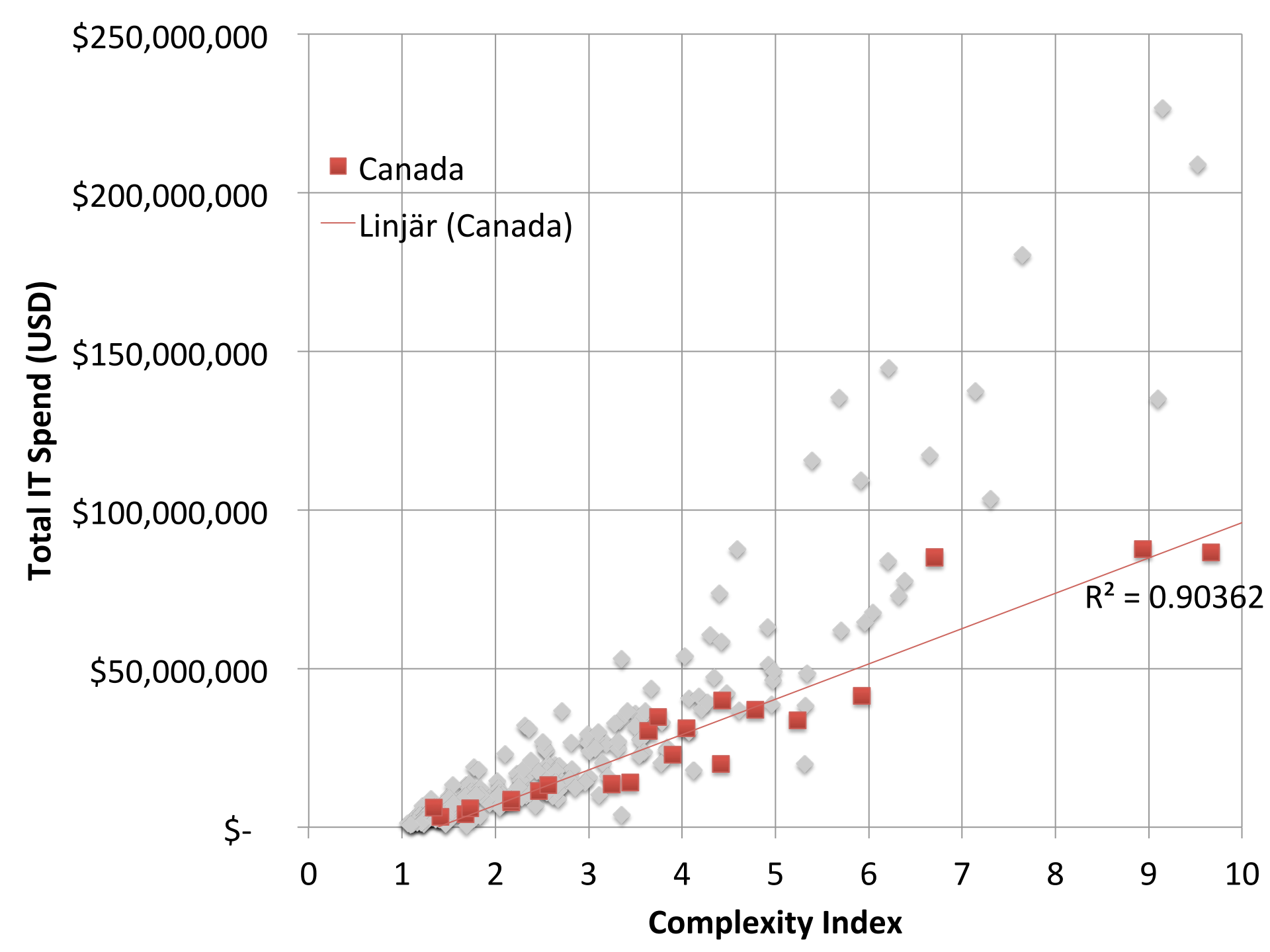
Complexity Index


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
Canada
Linjär (Canada)
R² = 0.90362
0
1
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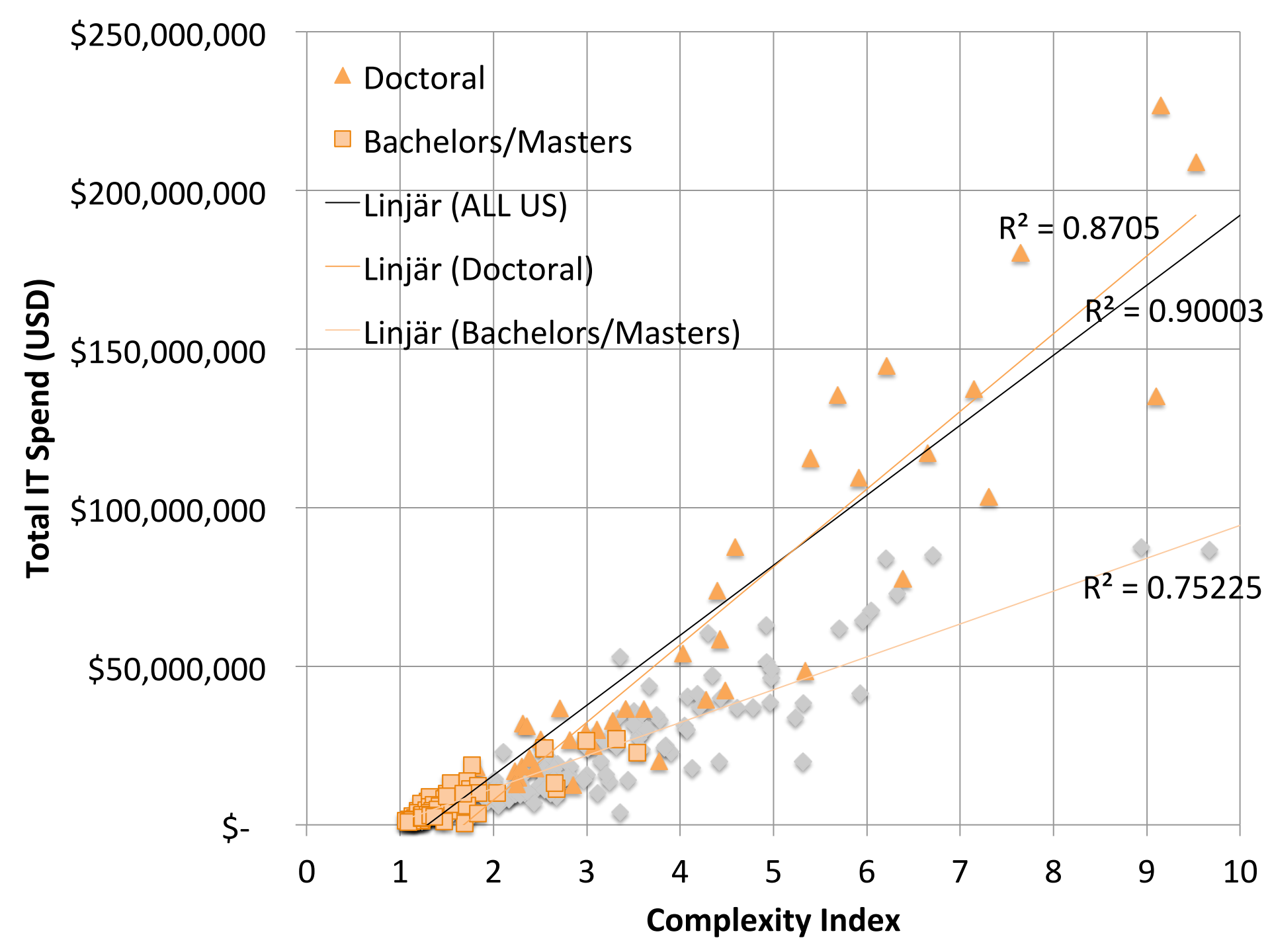
Complexity Index


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
0
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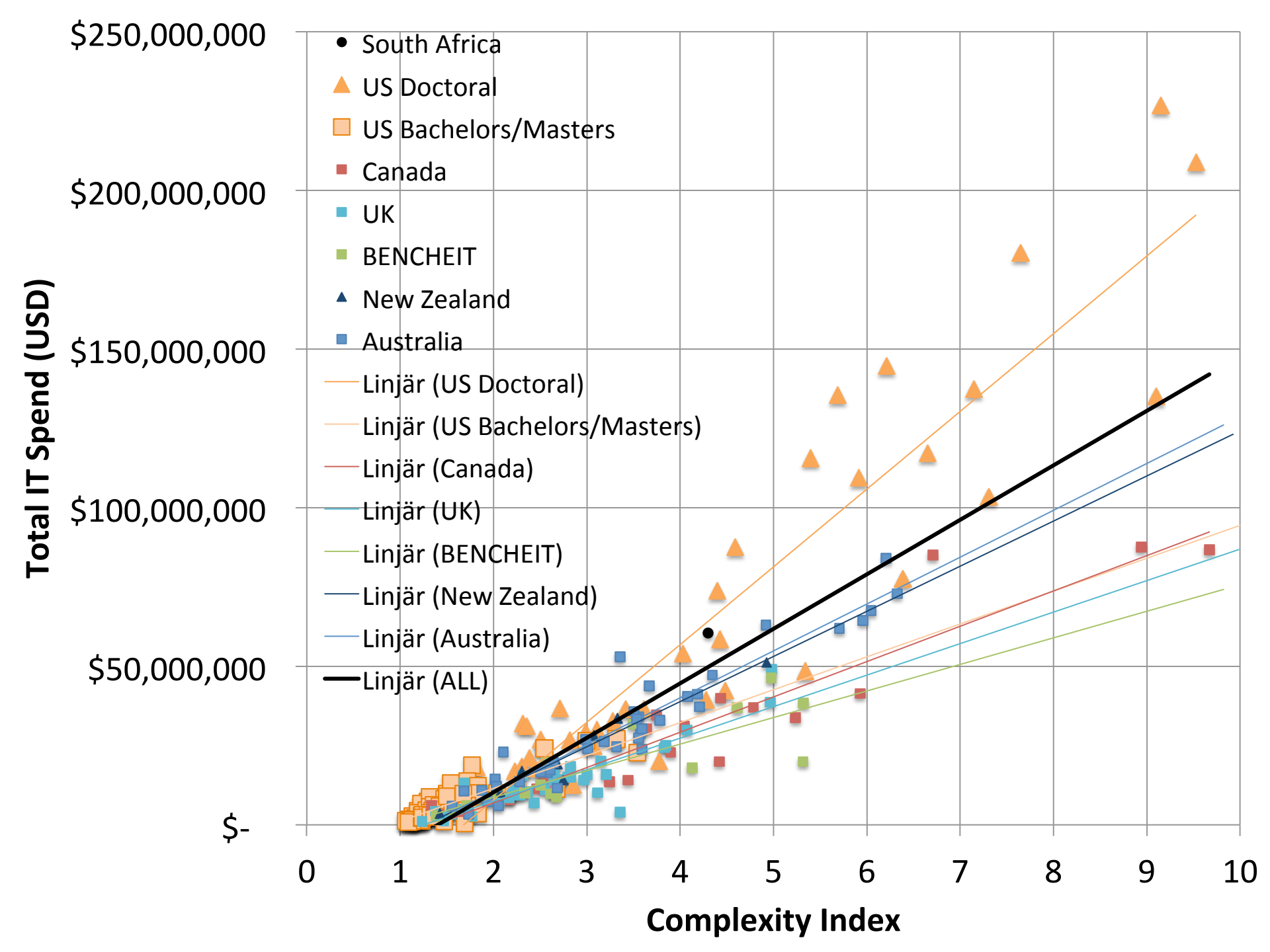
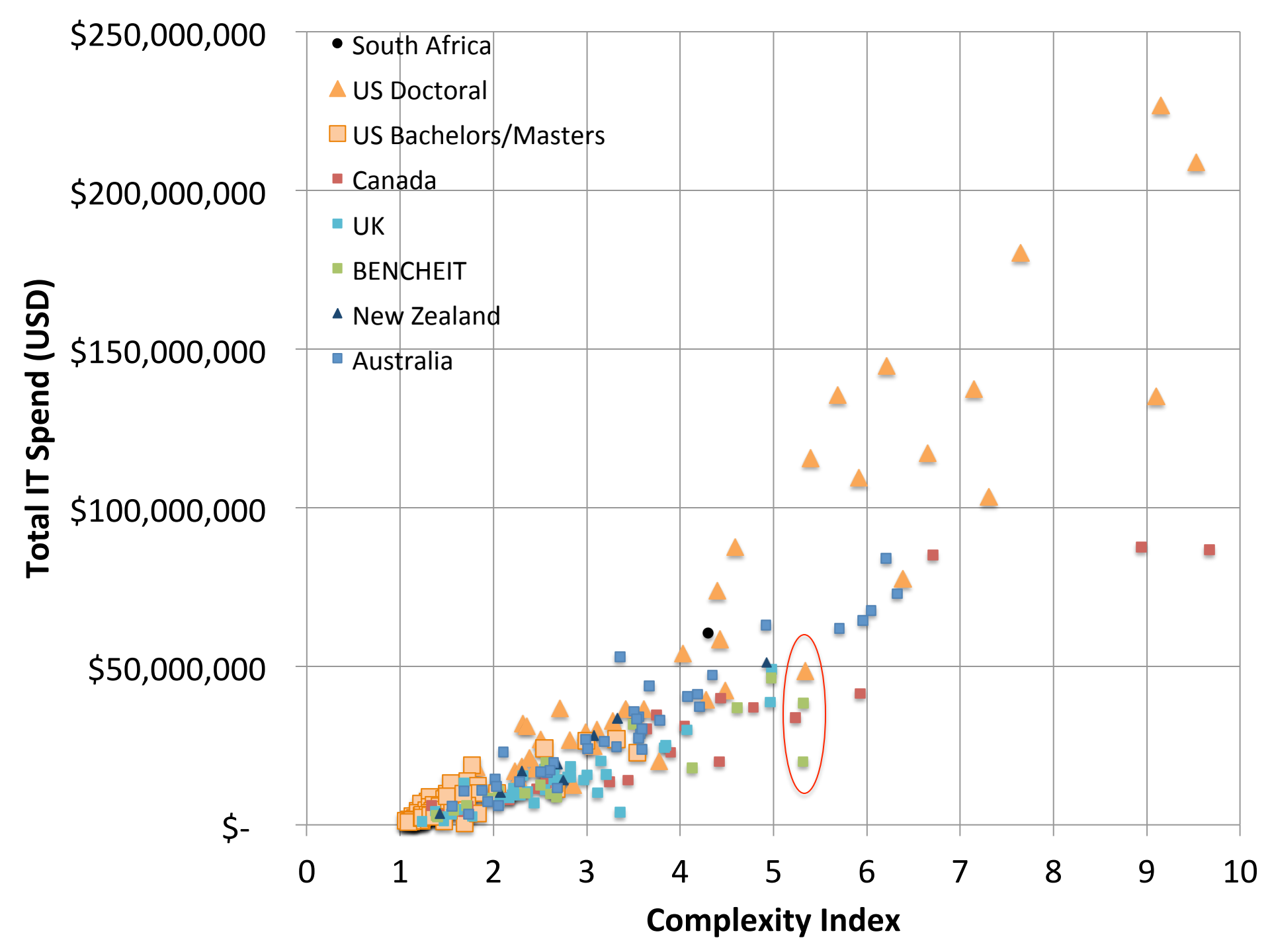
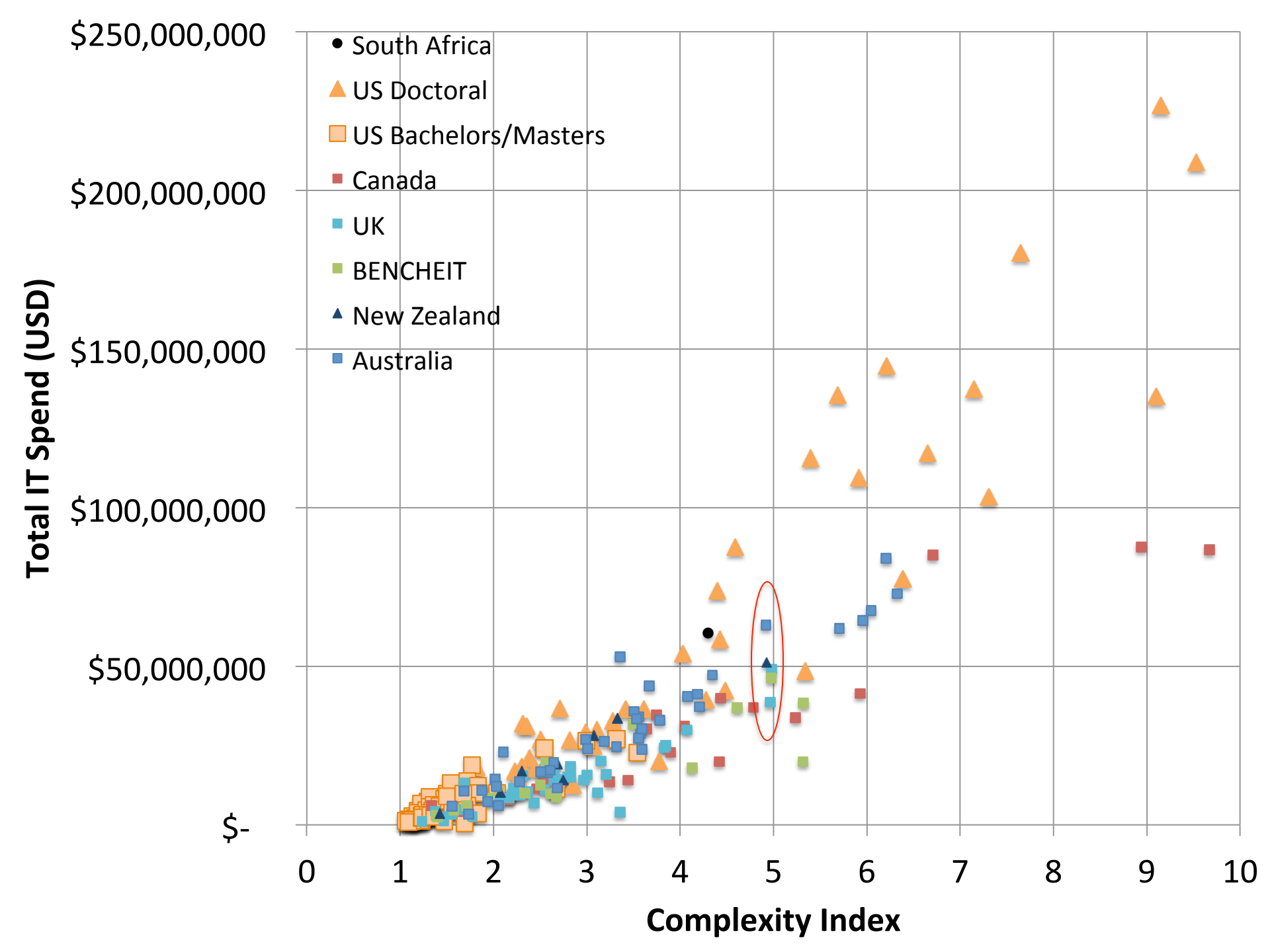
10
Complexity Index
Doctoral
Bachelors/Masters
Linjär (ALL US)
Linjär (Doctoral)
Linjär (Bachelors/Masters)
R² = 0.8705
R² = 0.90003
R² = 0.75225


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
0
1
2
3
4
5
6
7
8
9
10
Complexity Index
South Africa
US Doctoral
US Bachelors/Masters
Canada
UK
BENCHEIT
New Zealand
Australia
Linjär (US Doctoral)
Linjär (US Bachelors/Masters)
Linjär (Canada)
Linjär (UK)
Linjär (BENCHEIT)
Linjär (New Zealand)
Linjär (Australia)
Linjär (ALL)


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
South Africa
US Doctoral
US Bachelors/Masters
Canada
UK
BENCHEIT
New Zealand
Australia
0
1
2
3
4
5
6
7
8
9
10
Complexity Index


$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Total IT Spend (USD)
South Africa
US Doctoral
US Bachelors/Masters
Canada
UK
BENCHEIT
New Zealand
Australia
0
1
2
3
4
5
6
7
8
9
10
Complexity Index

Limitations

- Acquiring data may be difficult
- Complexity Index may not account for all institutional complexity (medical school, federal funding/programs, etc.)
- Inconsistencies in the definition of IT
- US data:
  - Total staff, not staff FTE
  - Research expenditures, not income
  - Estimates of central IT expenditures are more reliable than total IT expenditures

Next Steps:

- Identify and analyze outliers by country
- Refine model
- Draft a short white paper on the Complexity Index
- Develop a small set of metrics which can be used to benchmark internationally

CHEITA Benchmarking Project

Leah Lang

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Manager, Core Data Service

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