Empirical Analysis of Software Usage to Drive Policy Recommendations

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USCD
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BSA | The Software Alliance

Outline

- Introduction to BSA
- Global Studies and their Methodology
  - 2014 BSA Global Software Survey
  - 2015 IDC Malware Study
- China Specific Study
  - Recent survey regarding software asset management (SAM)
- Conclusions

BSA | The Software Alliance

BSA | The Software Alliance (www.bsa.org) is the leading advocate for the global software industry before governments and in the international marketplace. Its members are among the world's most innovative companies, creating software solutions that spark the economy and improve modern life. With headquarters in Washington, DC, and operations in more than 60 countries around the world, BSA pioneers compliance programs that promote legal software use and advocates for public policies that foster technology innovation and drive growth in the digital economy.

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Intellectual Property and Enforcement

- Copyright
- Patents
- Trade Secrets
- Licensed Use of Software by Enterprises
  - Enforcement → Litigation and Prosecution
  - Compliance → Software Asset Management

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Market Access for Data Intensive Industries

- Cross-border Data Flows
- Data and Server Localization
- Privacy
- Security
- Standards
- Competition

Government Procurement

- Access
- Compliance

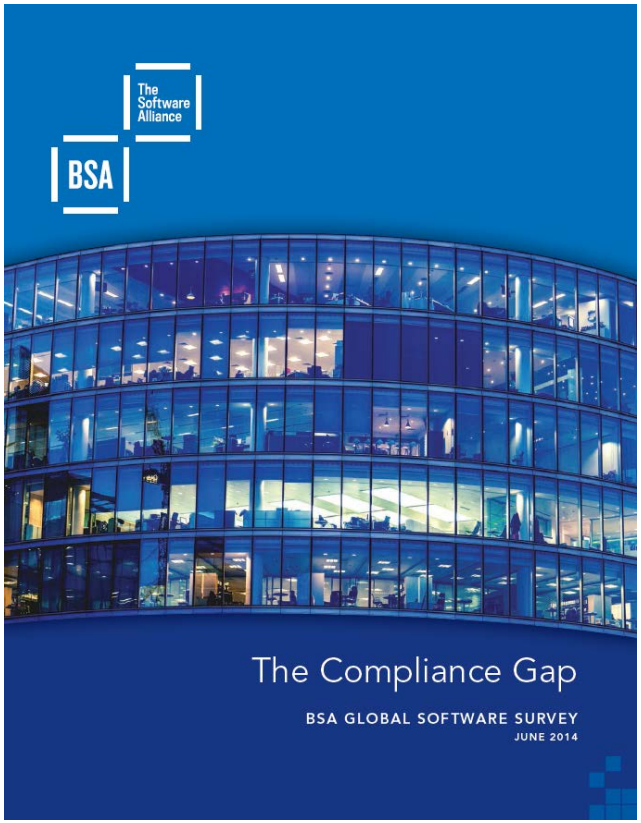
The Use of Data in Global Policy Advocacy

- Global Industry Studies
  - 2015 EU Cybersecurity Dashboard
  - 2014 Digital Trade Agenda
  - 2013 BSA Cloud Computing Score Card

- Empirical Studies on Software Use
  - 2014 Global Software Survey
  - 2015 Malware Study
  - 2015 China SAM Study
  - 2014 BSA Software Sales Survey

2014 Global Software Survey

http://globalstudy.bsa.org/2013/downloads/studies/2013GlobalSurvey_Study_en.pdf



2014 Global Software Survey

- **Purpose**
  - Quantifies the Volume and Value of Unlicensed Software Installed on PCs in a Given Year
  - Provide a Consistent Measure of the Use and Value of Unlicensed Software in Over 100 Markets Over a Period of Years to Identify Trends
  - Better Understand the Behaviors and Attitudes of Users Towards the Use of Unlicensed Software

2014 Global Software Survey

Methodology

- IDC Conducted Survey Global Survey of Home and Enterprise PC Users and IT Managers a Globally Representative Sample of Markets

Unlicensed Rate

Unlicensed Rate
=
Unlicensed Software Units/
Total Software Units Installed

PCs Getting Software
x
Software Units per PC
=
Total Software Units Installed

2014 Global Software Survey

Unlicensed Rate

Software Market Value/
Average Software Unit Price
=
Legitimate Software Units

Total Software Units Installed
–
Legitimate Software Units
=
Unlicensed Software Units

2014 Global Software Survey

Commercial Value of Unlicensed Software

Unlicensed Software Units
x
Average Software Unit Price
=
Commercial Value

2014 Global Software Survey

Definitions

- PC – Desktops, Laptops, and Ultra-Portables (e.g. Netbooks)
- Software includes:
  - Operating Systems, Systems Software (e.g. Databases and Security Packages), Business Applications, Consumer Applications (e.g. Games, Personal Finance, Reference Software)
  - Commercial Software, Open-Source, Free or Complementary Licenses
  - Cloud Computing Services that could Replace Installed Software (Saas, PaaS)
  - Software Sold as part of Legalization Programs (e.g. Bulk Sale for Government Distribution to Schools)
  - Does **NOT** include:
    - Software Loaded onto Tablets or Smart Phones
    - Software that Runs on Servers or Mainframes
    - Routine Device Drivers, Free Downloadable Utilities (e.g. Screen Savers)

2014 Global Software Survey

Conclusions

- **43%** of Software Installed on PCs Globally in 2013 was not Properly Licensed (Up from 42% in 2011)
- Commercial Value of Unlicensed Software Globally in 2013 was **$62.7 Billion**
- Only **35%** of Companies have Written Policies Requiring the Use of Properly Licensed Software
- Security is the Primary Reason Cited by Computer Users for Not Using Unlicensed Software
  - **64%** - Unauthorized Access (Hackers)
  - **59%** - Loss of Data

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2014 Global Software Survey

Top 20 Economies in Commercial Value of Unlicensed PC Software, 2013

Country	Unlicensed Value ($M)	Licensed Market ($M)	Unlicensed Rate
United States	$9,737	$44,357	18%
China	$8,767	$3,080	74%
India	$2,911	$1,941	60%
Brazil	$2,851	$2,851	50%
France	$2,685	$4,773	36%
Russia	$2,658	$1,629	62%
Germany	$2,158	$6,834	24%
United Kingdom	$2,019	$6,394	24%
Italy	$1,747	$1,970	47%
Indonesia	$1,463	$279	84%
Japan	$1,349	$5,751	19%
Mexico	$1,211	$1,032	54%
Canada	$1,089	$3,267	25%
Spain	$1,044	$1,276	45%
Venezuela	$1,030	$140	88%
Argentina	$950	$427	69%
Thailand	$869	$355	71%
Australia	$743	$2,795	21%
South Korea	$712	$1,162	38%
Vietnam	$620	$145	81%

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2014 Global Software Survey

	UNLICENSED SOFTWARE INSTALLATION RATES				COMMERCIAL VALUE OF UNLICENSED SOFTWARE ($M)			
	2013	2011	2009	2007	2013	2011	2009	2007
ASIA PACIFIC								
Australia	21%	23%	25%	28%	$743	$763	$550	$492
Bangladesh	87%	90%	91%	92%	$197	$147	$127	$92
Brunei	66%	67%	67%	67%	$13	$25	$14	$13
China	74%	77%	79%	82%	$8,767	$8,902	$7,583	$6,664
Hong Kong	43%	43%	47%	51%	$316	$232	$218	$224
India	60%	63%	65%	69%	$2,911	$2,930	$2,003	$2,025
Indonesia	84%	86%	86%	84%	$1,463	$1,467	$886	$411
Japan	19%	21%	21%	23%	$1,349	$1,875	$1,838	$1,791
Malaysia	54%	55%	58%	59%	$616	$657	$453	$311
New Zealand	20%	22%	22%	22%	$78	$99	$63	$55
Pakistan	85%	86%	84%	84%	$344	$278	$166	$125
Philippines	69%	70%	69%	69%	$444	$338	$217	$147
Singapore	32%	33%	35%	37%	$344	$255	$197	$159
South Korea	38%	40%	41%	43%	$712	$815	$575	$549
Sri Lanka	83%	84%	89%	90%	$187	$86	$77	$93
Taiwan	38%	37%	38%	40%	$305	$293	$227	$215
Thailand	71%	72%	75%	78%	$869	$852	$694	$468
Vietnam	81%	81%	85%	85%	$620	$395	$353	$200
Other AP	91%	91%	90%	91%	$763	$589	$303	$56
TOTAL AP	**62%**	**60%**	**59%**	**59%**	**$21,041**	**$20,998**	**$16,544**	**$14,090**

2014 Global Software Survey

Advantages of BSA's Global Software Survey

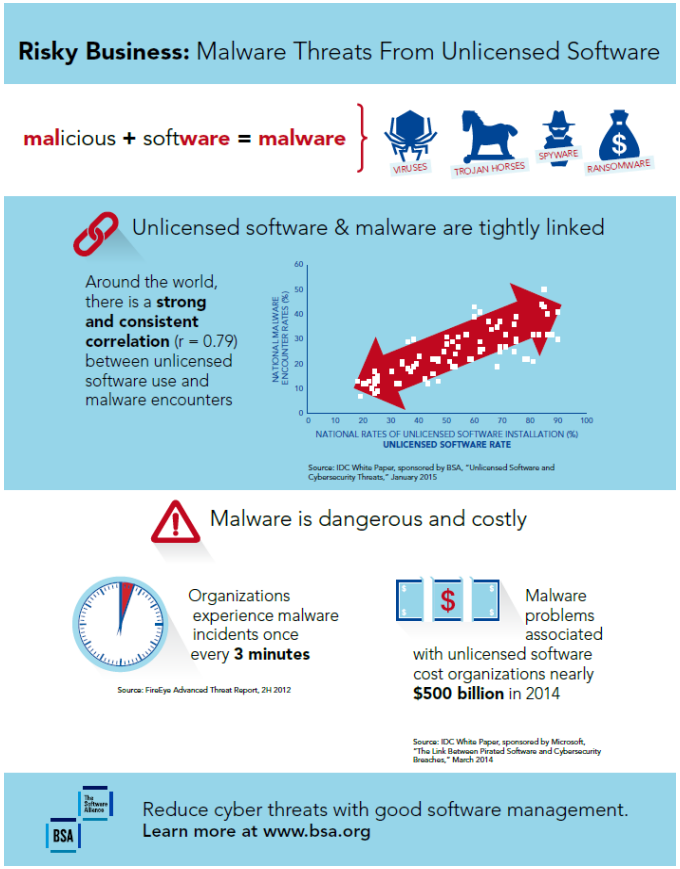
- Consistent Assessment Over Time to Identify Trends in Unlicensed Software Use
- Opportunity to Advocate for Policy and Enforcement Improvements to Address Empirically Observed Challenges
- Opportunity to Understand Behavioral Trends and Identify Persuasive Arguments for the Use of Licensed Software

Caveats

- Challenges Inherent to Survey Methodology (Reporting Biases – Can be Overcome to Some Extent with Independent Validation Measures)
- Evolving Business Models May Make Sample Criteria (e.g. PC-Installed Software) Less Relevant and Informative to Software Industry Concerns Over Time, but to Change Would Undermine Year-to-Year Consistency of Study and Trend Identification Efforts

2015 Malware Study

http://www.bsa.org/~/media/Files/Research%20Papers/IDCMalware/FinalIDCMalwareWPJan2015.pdf



2015 Malware Study

Purpose

Analyze the Relationship Between Unlicensed Software Use and Malware Encounters

Conclusions

- Strong Correlation Between Unlicensed Software Use and Malware Encounters
- Unlicensed Software Use is a Strong *Predictor* of Malware Encounters
- Empirical Evidence of Causation in this Correlation

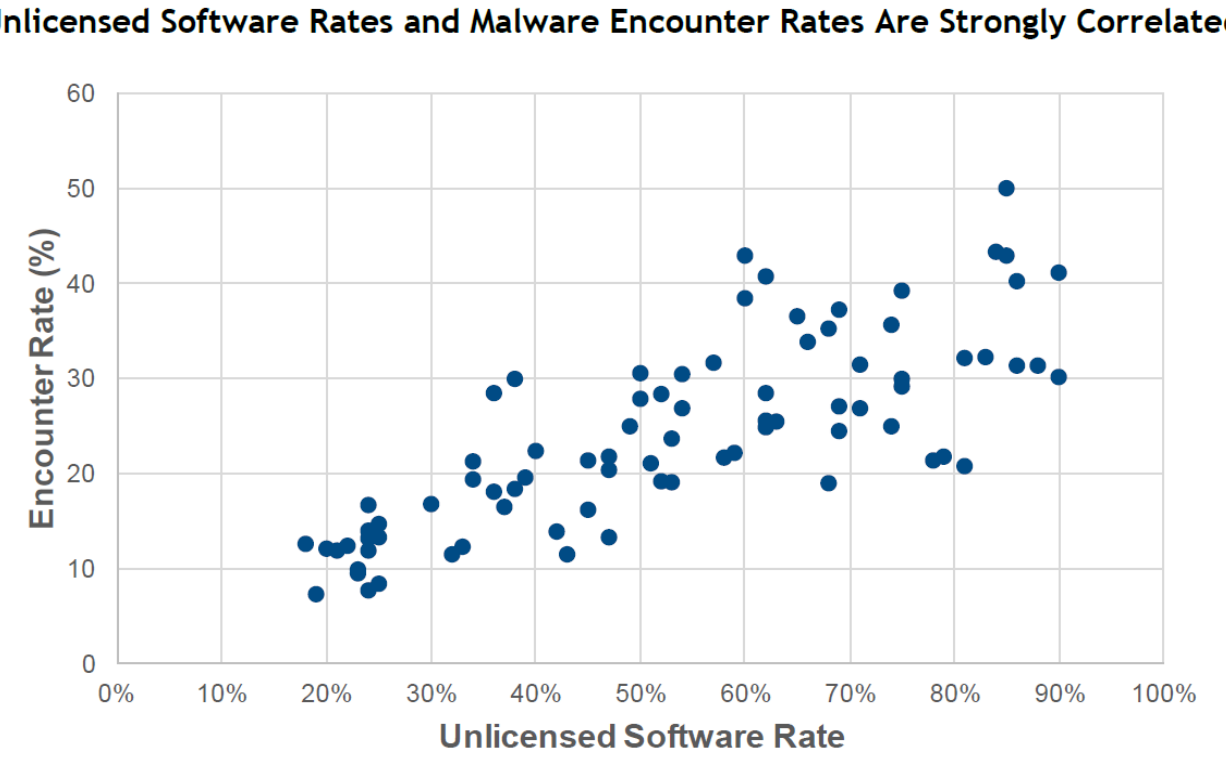
2015 Malware Study

Methodology

- Unlicensed Software Rates from 2014 BSA Global Software Survey
- Cybersecurity Threat Information from Microsoft's Security Intelligence Report http://www.microsoft.com/security/sir/default.aspx
- Malware Encounter Rate = Percentage of Computers Running Microsoft Real-Time Security Software that Reported Detecting Malware in a Quarter (~20% of PCs Worldwide per Quarter in 2013).

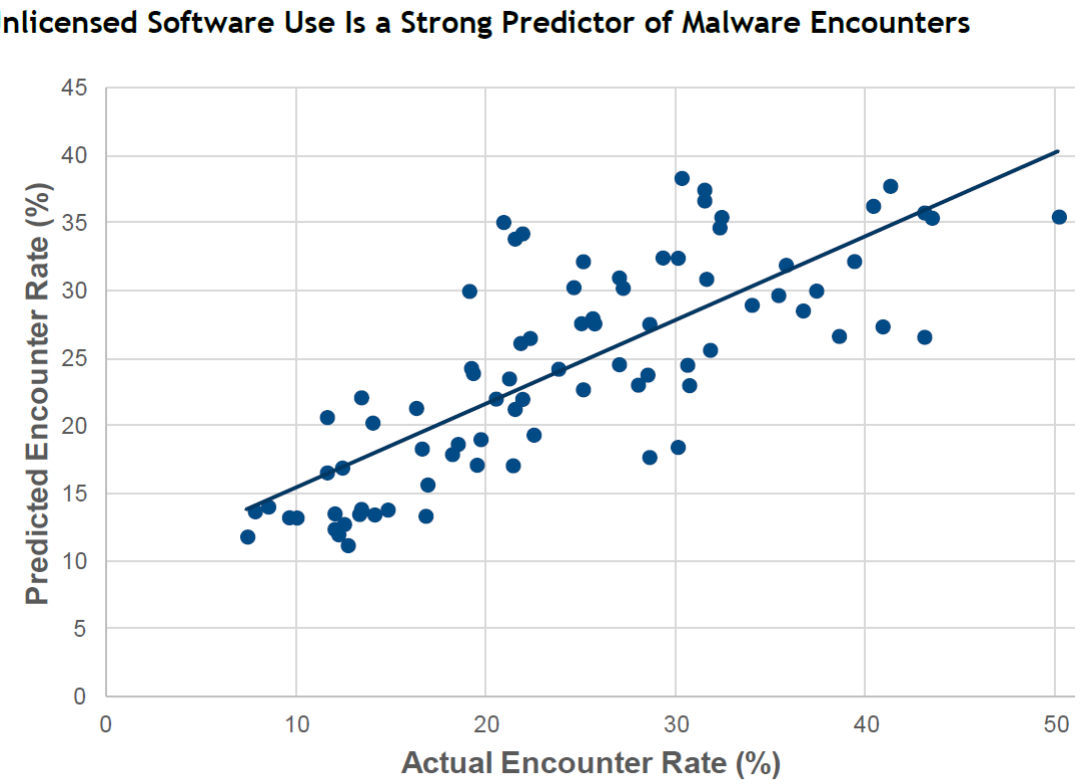
2015 Malware Study

Correlation: r = 0.79



2015 Malware Study

Prediction: $R^2 = 0.62$



2015 Malware Study

Evidence of Causation

- 2014 Study by IDC and National University of Singapore (NUS) Finding Frequent Malware in PCs Pre-Installed with Unlicensed Software, Unlicensed DVDs, and Unlicensed Downloaded Software and Activation Keys.
- Survey Results (Same Study):
  - 20% Stated Unlicensed Software had Infected Their PCs with Viruses
  - 40% Stated Unlicensed Software Slowed Their PCs
  - 10% State Unlicensed Software had Destroyed Files
- The Results Make Clear that Some Malware Comes from Unlicensed Software
- Most Malware Constitutes a Cybersecruity Threat (Separate Studies)

Software Asset Management (SAM) Promotes Software Legalization and Improves IT Efficiency

Purpose

- Assess the Adoption of Software Asset Management in China

Methodology

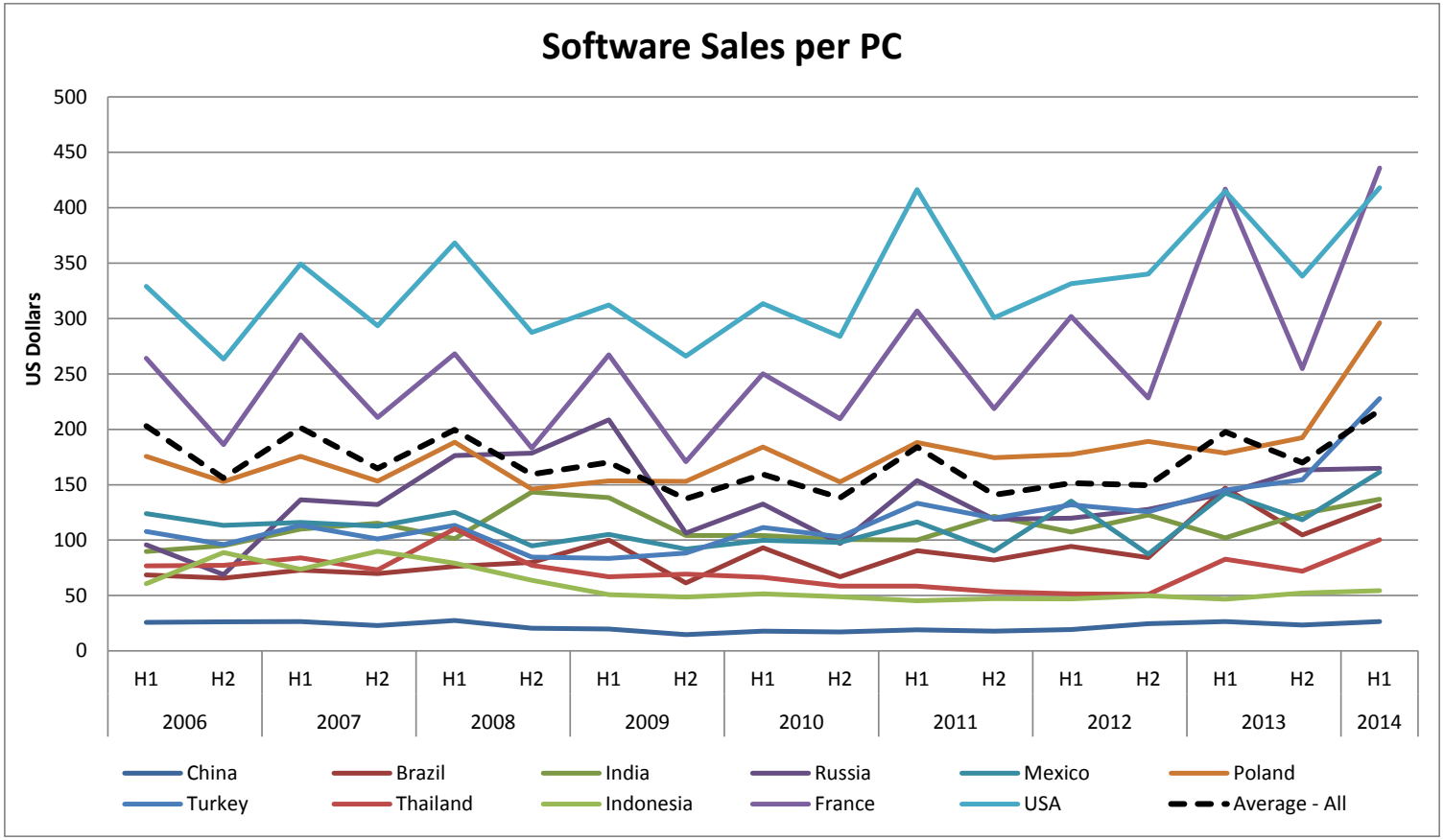
- Survey Over 120 Chinese Companies with more than 250 Employees in the Manufacturing and Financial Sectors

Software Asset Management (SAM) Promotes Software Legalization and Improves IT Efficiency

Results

- **98.3%** of the companies surveyed believed that SAM can **improve their enterprises' IT management and optimize their internal IT operational procedures.**
- **97.5%** believed that SAM **helps to ensure IT compliance** within an enterprise.
- **69.2%** believed that SAM **helps to improve operational efficiency**.
- **54.2%** believed that SAM can help them **meet the requirements of relevant national and international SAM standards such as ISO/IEC19770**.
- The **majority** of IT managers from the enterprises surveyed admitted that SAM was critical for their organizations: **68%** of respondents rated SAM as **important** for their organization; **29%** of responses were **neutral**; while **3%** believed it was **unimportant**.
- Yet, **only 3.4%** of the surveyed Chinese manufacturing and financial services companies **admitted to adopting a SAM policy and practice**.

2014 BSA Software Sales Survey



2014 BSA Software Sales Survey

TOTAL COUNTRIES

	2006		2007		2008		2009		2010		2011		2012		2013		2014
Sales per PC (USD)	**H1**	**H2**	**H1**	**H2**	**H1**	**H2**	**H1**	**H2**	**H1**	**H2**	**H1**	**H2**	**H1**	**H2**	**H1**	**H2**	**H1**
China	26	26	26	23	27	21	20	15	18	17	19	18	19	25	27	23	26
Brazil	69	66	73	70	76	80	100	61	93	67	90	82	94	84	147	105	131
India	90	95	110	115	101	143	138	104	104	100	100	122	107	123	102	124	137
Russia	96	69	136	132	176	178	208	106	133	97	154	119	120	128	142	163	165
Mexico	124	113	116	113	125	95	105	92	100	98	116	90	135	87	142	118	161
Poland	176	153	176	153	188	146	154	153	184	153	188	175	177	189	179	192	296
Turkey	108	96	113	101	113	85	84	88	111	103	133	120	132	126	145	154	228
Thailand	77	77	84	73	110	77	67	69	66	59	59	53	52	51	83	72	100
Indonesia	61	89	74	90	79	64	51	49	52	49	45	47	47	50	47	52	55
France	264	186	285	211	268	183	267	171	250	210	307	219	302	228	417	255	436
USA	329	263	349	293	368	288	312	266	313	284	417	301	332	340	415	338	418
Average - All	203	156	201	165	200	159	170	137	159	138	184	141	152	149	198	170	217

2014 BSA Software Sales Survey

Conclusions

- Software Sales per PC Vary Widely
- There Appears to be a Correlation Between Levels of Economic Development (e.g. Per Capita GDP) and Software Sales per PC
- However, the Correlation is Not High
- Some Countries with Relatively Low Per Capita GDP have Relatively Higher Software Sales per PC and Vice Versa

2014 BSA Software Sales Survey

Country	Per Capita GDP (2014)	Software Sales/PC (2014 H1)
India	$5,800	$137
Indonesia	$10,200	$55
China	$12,900	$26
Thailand	$14,400	$100
Brazil	$15,200	$131
Mexico	$17,900	$161
United States	$54,800	$418

Other Questions of Potential Interest to BSA

- What are the Factors that Facilitate Growth in the IT/Software Development Sector in a Country?
  - To What Extent do IP Rights (Copyright, Patents, Trade Secrets) Contribute?
  - To What Extent does Foreign Competition Help (or Hurt?) Domestic Development of this Sector?
- What is the Relationship Between the Availability of Computer-Enabled Inventions and Innovation in the IT-sector?
- To What Extent Does Freedom to Contract versus Regulatory Approaches to Employee-Inventor Reward and Remuneration Affect Investment and Outcomes in R&D (in Software, IT or Generally)?

Conclusions

- BSA Invests Significant Resources to Understand Market Trends and Behaviors to Inform our Policy Advocacy and Compliance Programs
- Quantitative, Verifiable Data Provides a Solid Foundation for Our Efforts Before the US and Foreign Governments
- We Have Found Such Efforts to Use Evidence-Based Arguments can be Persuasive
- Governments Naturally Attempt to Develop Policies that Accrue to Perceived National Interests
- We are Constantly Looking to Improve our Methodology and Address Valid Criticisms of Either the Findings or our Conclusions

BSA

Thank You!

2015 EU Cybersecurity Dashboard

http://cybersecurity.bsa.org/assets/PDFs/study_eucybersecurity_en.pdf

2014 Digital Trade Agenda

http://www.bsa.org/~/media/Files/Policy/Trade/DTA_study_en.pdf

2013 BSA Global Cloud Computing Scorecard

http://www.bsa.org/~/media/Files/Research%20Papers/GlobalCloudScorecard/BSA_Global%20Cloud%20Scorecard_021113.pdf