

Copyright Piracy: Measuring the Extent and Impact

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for

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Significance of Piracy

- IFPI (John Kennedy)
 - “The music industry fights piracy because if it did not, the music industry would quite simply not exist”
 - Reported piracy figures “reflect the real damage that this mass-scale copyright theft is doing ... to innovation and economic growth”
- BSA/IDC – piracy leads to
 - software industries crippled by competition
 - less software being produced and purchased
 - loss of tax revenues and jobs

BSA/IDC Economic Impact Study

- 10% decrease in worldwide piracy rate over 4 years would...
 - add 1.5 million new jobs, \$64 billion in taxes, and \$400 billion in economic growth
 - yield larger benefit for countries with higher piracy rates
- Piracy rate – measurement issue
- Impact – modeling and economic issue

Agenda

- Measuring the extent of piracy
 - BSA/IDC methodology
 - Our approach
- Assessing the economic impact of piracy
 - Industry estimates
 - Our findings for music CDs
- Supply of intellectual property?

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BSA/IDC Methodology

- Pirated quantity = total demand – total supply (legitimate purchases)
- Total demand = average no. of units of software installed on each PC × no. of PCs
- Total supply (legitimate) = software revenues ÷ unit price
- Separate estimates for
 - businesses / consumers
 - new computers / existing computers
 - each software category (PC gaming, utilities, etc.)

Limitations

- Demand (installed software):
 - Consumer and business surveys: Which are general productivity or office software, professional applications, personal finance, etc.?
 - Respondents must exclude open source or free software from their estimates
- Supply (legitimate sales):
 - Revenues include software outside the categories sampled in the demand survey
 - Only five categories of software are used to calculate the unit price of software

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General Challenges

- Data sources
 - Without access to industry sources or supplier estimates, most practical option → consumer and retailer surveys
- Accuracy of data

Data Sources

- Census and consumer survey
 - Software installation data
 - Purchase of new and replacement computers
 - New software installed on existing computers
- Surveys of software wholesaler and retailers
 - Direct estimation of unit shipment
 - Better source of information on site licenses and bundled software

Data Accuracy

- Count representative software in each software category, e.g.,
 - Office software: MS Office, Outlook, etc.
 - Professional Applications: AutoCAD, PhotoShop, etc.
 - Operating systems: Windows, MacOS, etc.

Advantages

- Demand side:
 - No ambiguity about which software to include
 - Explicit control for free or open source software
- Supply side:
 - Enable large-scale survey with software retailers (cf. using aggregate software revenues)
 - Not subject to biases due to inclusion of incomplete and inconsistent categories of software
- Account for: Bundled software, site licenses, software transfer from old to new PCs

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Impact of Piracy – 2004

- IFPI – world pirate music market worth US\$4.6 billion
- BSA – dollar losses due to software piracy > US\$30 billion

Industry Estimates

- 1 unit of pirated good = 1 unit of loss
- Limitations:
 - Absent piracy, some would simply not use / purchase a product
 - Piracy encourages sampling and sharing, which may raise sales
 - Piracy increases popularity of product due to word of mouth

Industry Estimates

- BSA/IDC Economic Impact Study (2003)
 - “While not every piece of formerly pirated software will be purchased if piracy rates go down – some will be substituted, some not used – at the same time lower piracy rates yield more economic activity that stimulates more software production and purchase. The two countervailing forces seem to cancel each other out. *This is the conventional assumption for most previously published piracy studies.*”

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Setting

- Music CD sales from 1994 to 1998 in 28 countries
- Data sources
 - CD sales and unit prices: GMID
 - Music piracy: IFPI

Methodology

- Economic modeling
 - Allow for both positive and negative impacts of piracy on legitimate sales
 - Control for income, ownership of CD players, and influence of music exposure
 - Net impact is derived empirically → data speak for themselves

Findings

- Absent piracy, the demand for legitimate music CD and price would be higher
- 1 unit of pirated CD = 0.42 unit loss in sale
 - By IFPI/BSA assumption, average loss in per-capita CD demand = 0.227 unit
 - Actual loss = 0.095 unit
- Revenue loss exceeded 6.6%
 - Price effect

Implications

- One-to-one assumption was not consistent with observed music data
- Other indicators?
 - Jobs increase, tax revenue, economic growth

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Broader Issues

- Do economic incentives affect the supply of creative work?
 - If yes, would extended duration of copyright increase innovation?

Movie Supply

- Similar methodology as music piracy study
- U.S. copyright extension – Sonny Bono Copyright Term Extension Act, 1998
 - Positive but not statistically significant effect on movie production

Supply of Intellectual Property

- Open questions:
 - Effect of copyright on production of creative work?
 - Effect of piracy on production of creative work?
- Need bigger data-sets:
 - longer time period
 - more countries
 - more products – movies, music CDs, books

Way Forward

- Measurement: better data sources
 - Participation by government, industry bodies, and vendors
- Impacts: better methodologies
 - Critical evaluation of assumptions
 - Joint collaboration between industry and academics

References

- Kai-Lung Hui & I.P.L. Png, "Business Software Piracy: Methodology," Economic Analysis Associates, for Ministry of Law, Singapore, 2003.
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