Measuring the Impact of Electronic Library Materials on the University’s Research Mission

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Scholarly Research Productivity

- Expenditures for Electronic Materials
- Institutional Characteristics
- Other Library Variables

VCU Libraries
Virginia Commonwealth University
sea-change

↑ +92% increase in electronic materials expenditures

↑ Electronic materials as percent of total materials expenditures

- 2005 = 46%
- 2010 = 70%
stating the obvious

How Electronic Materials Improve Research Productivity

- Access from anywhere
- Instant access
- Easily stored and retrieved
- Most always available
- Time-motion advantage
the data

DATASET

• 271 Carnegie-classified US doctoral institutions

DATA COLLECTION, 2005–2010

• Number of Journal Articles: WEB OF KNOWLEDGE
• Library Characteristics: ACRL TRENDS AND STATISTICS
• Institutional Characteristics: IPEDS
Library Characteristics

Variables from ACRL Survey

- Electronic Material Expenditures
- Total Library Expenditures
- Total Library Material Expenditures
- Professional Salaries
- Library Personnel FTE
- Various Serials-Related Measures
- Various Volume and Title Count Measures
- ILL Borrowing
Institutional Characteristics Variables from IPEDS

- Faculty FTE
- Research Expenditures
- Instructional Salaries
- Research Salaries
- Total Revenue
- Grant Revenue
- PhDs Awarded
- Year-End Endowment
research design

Electronic Material Exp. + Other Library Variables + Other University Variables = Number of Journal Articles
initial model equation

-1224.087  Constant
+ .000511  x  (Electronic Library Materials)
+ 18.084  x  (Professional Librarians FTE)
+ .00000176  x  (Total University Revenue)
+ .709  x  (Faculty FTE)
+ .0000176  x  (Research Expenditures)
+ 23265.67  x  (1 For Harvard, 0 Everyone Else)

= NUMBER OF JOURNAL ARTICLES
## REGRESSION OUTPUT

(adj. r-square .922)

### Initial Model

<table>
<thead>
<tr>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
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<tbody>
<tr>
<td><strong>B</strong></td>
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relative impact of library measures

.185  Electronic Material Expenditures

.153  Total Library Expenditures

.112  Library Material Expenditures
best fit model equation

\[-1196.806 \times \text{Constant} + 0.000486 \times (\text{Electronic Library Materials}) + -0.000271 \times (\text{Non-Elect. Library Materials}) + 29.450 \times (\text{Professional Librarian FTE}) + 0.0000162 \times (\text{Research Expenditures}) + 0.0000218 \times (\text{Total University Revenue}) + 0.648 \times (\text{Faculty FTE}) + 22268.145 \times (1 \text{ for Harvard, } 0 \text{ for Everyone Else})\]

= NUMBER OF JOURNAL ARTICLES, 2005-10
best fit model

REGRESSION OUTPUT

(adj. r-square .923)

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best fit model equation

-1196.806 (Constant)
+ .000486 x $7,077,938 (Elect Lib Mat)
+ -.000271 x $6,316,808 (Non-Elect Lib Mat)
+ 29.450 x 95 (Pro Lib Staff FTE)
+ .0000162 x $254,688,800 (Research Expenditures)
+ .00000218 x $2,048,342,200 (Total University Revenue)
+ .648 x 2,322 (Faculty FTE)
+ 22268.145 x 0 (Not Harvard)

= 13,425 ARTICLES PREDICTED, 2005-2010
best fit model equation

-1196.806 (Constant)
+ 0.000486 x $8,077,938 (Elect Lib Mat)
+ -0.000271 x $5,316,808 (Non-Elect Lib Mat)
+ 29.450 x 95 (Pro Lib Staff FTE)
+ 0.0000162 x $254,688,800 (Research Expenditures)
+ 0.00000218 x $2,048,342,200 (Total University Revenue)
+ 0.648 x 2,322 (Faculty FTE)
+ 22268.145 x 0 (Not Harvard)

= 14,186 ARTICLES PREDICTED, 2005-2010
(diff. 761 or 126/yr)
next steps

Incorporate feedback

Replicate in Academic Analytics

Qualitative investigation