

The Internet and the American Economic Association—A Set of Proposals

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Abstract

The Internet poses numerous short- and long-term opportunities and challenges for almost all the operations of the American Economic Association. This paper examines these challenges and proposes various actions. In general terms, the AEA should first adapt its operations to maintain a constant level of service to its members in this changing environment. Second, the AEA charter calls for the “encouragement of perfect freedom of economic discussion,” and the cost-reducing promise of the Internet and associated computer technologies brings us closer to this goal, but their full potential requires their adoption by the AEA. Finally, the AEA is uniquely positioned as a large, capable non-profit to implement these new services.

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Introduction

The Internet poses clear opportunities and challenges to the economics profession and the American Economic Association. Some of these issues were discussed in Goffe and Parks (1997), but much of that paper's focus was on the profession in general, and the points touching on the AEA were limited in both length and background knowledge. This paper attempts to fill that void and begin a discussion on these issues.

Even in the aftermath of the dot.com implosion, the Internet is clearly having an impact in many areas. Currently, the most noteworthy seems to be the users of file-sharing programs challenging the recording industry, but many other industries have had to adapt, such as the travel and retail book industries. Academia is hardly immune to these challenges—already, academic publishers are under some pressure, and with time distance education may make universities more competitive with each other. Clearly, established practices and relationships are changing.

This paper examines how the Internet may challenge and present opportunities to the AEA that did not exist in the paper-bound past. It attempts to be wide ranging, and in places will simply point out possibilities to help initiate a debate. Some of the proposals are short-term, while others would take years to implement.

There are several reasons why the Internet should interest the AEA. The AEA charter calls for the “encouragement of economic research” and the “encouragement of perfect freedom of economic discussion.” It is hard to imagine following these precepts today without extensive use of the Internet. The Internet is an important part of the professional lives of economists, and the AEA should be an integral part of this. In addition, the Internet and related computer technologies reduce the costs of communication, which certainly aids achieving the goals of its charter. While other organizations will certainly play a role in helping to bring the Internet to economists, the AEA is unique with its non-profit status, its relatively large array of resources, and its level of prominence and leadership.

This paper assumes that rapid and radical change is unlikely in the research practices of the profession; instead, gradual change seems most probable. In particular, it is doubtful that economists would suddenly quit publishing in refereed journals. An oft-mentioned counter-example is near-complete reliance by high-energy physicists (and dramatically increasing usage by other physicists) on the “e-Print ArXiv” at Cornell (<http://xxx.arXiv.org>).¹ However, as described by Odlyzko (1997), this archive simply substituted an on-line medium for the dominant paper “preprint” culture in high-energy physics—departments used to spend tens of thousands of dollars a year mailing preprints, so moving these preprints on-line was hardly a fundamental change. Even so, most physicists still publish. Using physics as a guide, some commentators are promoting the quick rise of a similar culture of “self-archiving” without traditional publication by authors in other disciplines, but this seems unlikely given academia's resistance to change.

An explanation of this conservative nature is described in Parks (2002), which he calls the “Faustian Grip,” a play on the “Faustian Bargain” by Harnad (1995). Harnad describes that in the days of paper publications, academics were willing to relinquish the copyrights to their works to enable publishers to receive a fair return to disseminate those works. The “Faustian Grip” describes how few have an incentive to change this system. Editors certainly do not, and of course publishers have even less incentive. Senior academics “cut their teeth” with the current system, and junior academics do not wish to risk their careers (how many would pass up a possibility to publish in the *American Economic Review*?). While libraries complain vociferously about journal prices, they

hardly want to see journals as we know them disappear.² Of course, as Varian (1998) notes, practices should evolve with this new medium, but the emphasis is on evolution. Harnad's vision will be slow to arrive as few have an incentive to change the current system. Thus, an evolution of the existing practice of publishing in journals seems the most probable future.

The current impact of the Internet clearly varies by field—physics appears to be the most advanced; this is plausibly due to their technical skills, a standard word processing system (T_EX and its variants), and an easy transition to the Internet as it substituted for existing practices with the distribution of preprints. Physicists' activity on the Internet centers around ArXiv.org. According to the noted theoretical physicist and mathematician Brian Greene of Columbia University, some senior physicists no longer bother to publish in paper journals (W. Goffe, personal communication, Oct. 5, 1999).³ However, all “publish” at ArXiv.org. In September 2003, more than 3,500 working papers were submitted and more than 40,000 computers connected to the archive that month (http://arxiv.org/show_monthly_submissions). As of October 2, 2003 it contained 249,219 papers (http://arxiv.org/show_monthly_submissions).⁴ This system, connecting physicists around the world via the Internet, has dramatically changed physics research—results are available nearly instantly, the literature can be followed both backwards and forwards with its integrated bibliography with clicks of a mouse, costs have been dramatically reduced, and there is egalitarian access for all.⁵ While physics is unique in its use of the Internet and their transition was quite easy, it points the way for other professions.

The impact on professional societies may not be as straightforward. The American Physical Society faces a “rapidly accelerating” (APS News, 2000) decline in member subscriptions to its journals. The APS President worries (Langer, 2000):

This new system of scientific communication—to a large extent Paul Ginsparg's [the developer of ArXiv.org] brainchild—is doing far more than just providing an ultra-effective mode of operation for scientists. It is forcing a complete reevaluation of the role of scholarly journals and, inevitably, an equally thorough reevaluation of the roles of organizations like the American Physical Society. As current president of the APS, I will take the viewpoint of the APS in what I say here. The issues, however, are much broader. They are faced by virtually every scholarly society, including the other member societies of the American Institute of Physics as well as others far outside of physics.

This paper examines many different parts of the AEA. In order by sections, they are: EconLit, AEA journals, expanded ties to economists already providing Internet services, setting up an AEA working paper site, the AEA Directory, a database for referee reports, “Resources for Economists on the Internet,” and the annual meeting. Before the conclusion there is a summary of recommended actions. The unifying theme of these sections is that the AEA should take a number of steps to maintain a consistent level of services to its members and to fulfill its charter. In the past, it could be argued that EconLit arose from a need to deal with a burgeoning literature, and the *Journal of Economic Perspectives* arose from a need for a journal to help bridge an increasingly specialized profession. In much the same way, the Internet poses challenges for today. Plus, as a large and capable non-profit, it should be able to provide these services at a lower cost than others. Unlike commercial publishers, there is no profit motive and perhaps less of an incentive to price substantially above costs.⁶ But, as the largest economic professional society, it does command substantial

resources and implicit leadership that can be used for the changing environment we face. Thus, the AEA is unique in its ability to help economists make the transition to the full benefits of the Internet.

EconLit

Forward Citations

EconLit is a database of bibliographical information from approximately 600 economics journals. It is available in many libraries and for purchase on CD-ROM; it has been produced by the AEA for more than 30 years. It might be expanded in the following way. With the rise of the Internet, there has been a great deal of interest in “citation linking”—you can read an on-line journal at one site, and with a click, be brought to the reference at another site (CrossRef, <http://crossref.org> is the leader). A subset of citation linking, forward citations, might be applied to EconLit. That is, for a given paper, one could search for papers that *reference* it. Figure 1 shows an example Broeck (1999) from the ArXiv.org; it must be one of the most speculative but recognizable topics in the 249,000 paper archive. When the phrase “cited by” near the bottom of Figure 1 is clicked on,⁷ one sees Figure 2 with data from the SLAC Spires HEP Database (<http://www.slac.stanford.edu/spires/hep/>). That these are forward citations can be clearly seen by the reference numbers—the original paper is denoted by 9905084 (the 84th paper in May, 1999 for its first version) and the most recent work that cites this paper went into the archive in November of 2002 (in all, 11 papers cite the original one). The astronomy community benefits from a similar system with their "Astrophysics Data System ADS Abstract Service" (http://adswww.harvard.edu/ads_abstracts.html) with 3.3 million abstracts.

For economists, rather than having to consult the Social Sciences Citation Index in its print version or its clunky electronic interface, forward citations could be built into an expanded EconLit. If too expensive to do by hand (it would be a low-skill activity, so perhaps the costs could be low), perhaps software used in the citation linking projects might be employed. Forward citations would clearly add value to EconLit, and presumably increase its marketability and use.⁸

Figure 1. ArXiv.org Paper Abstract

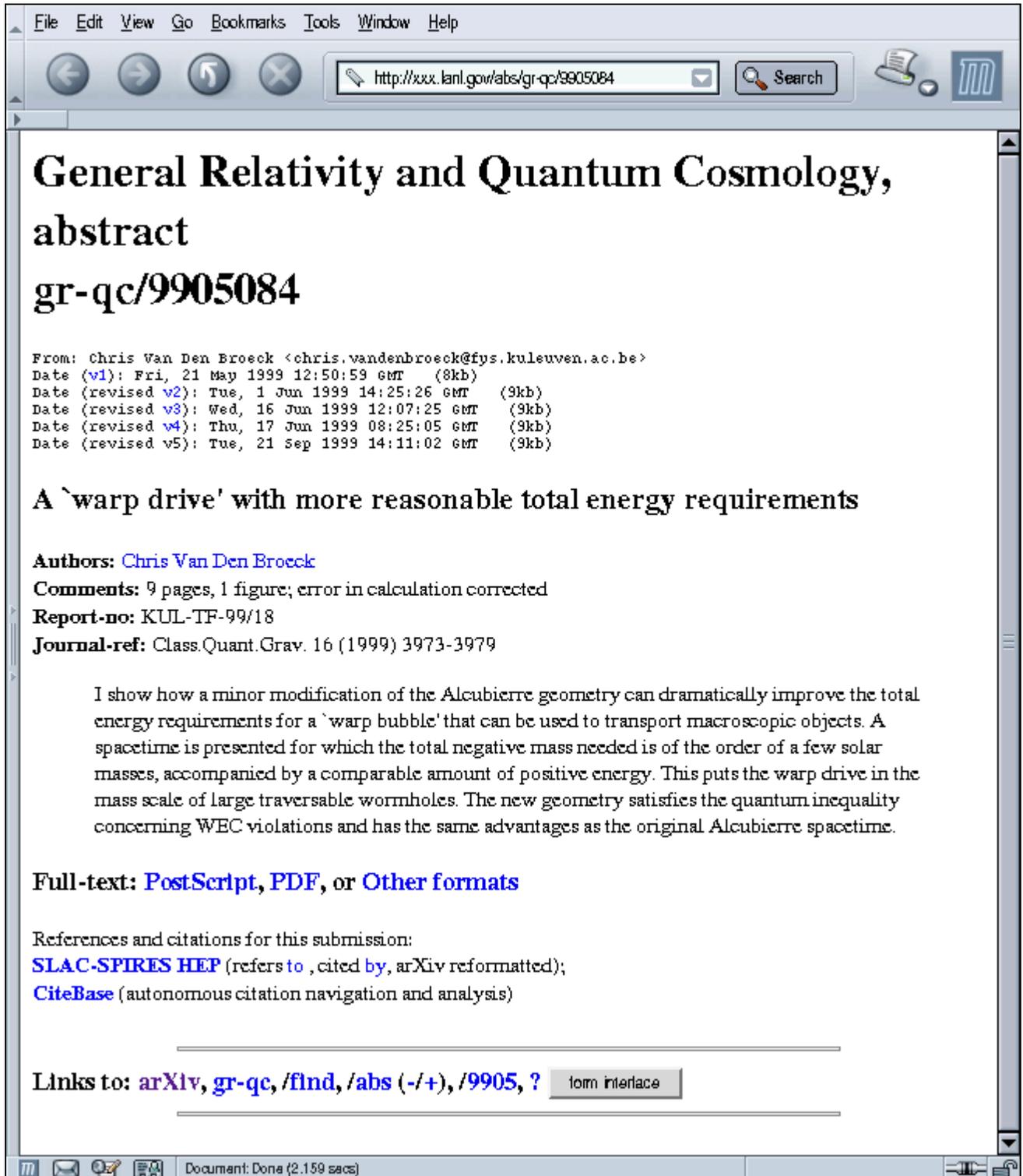
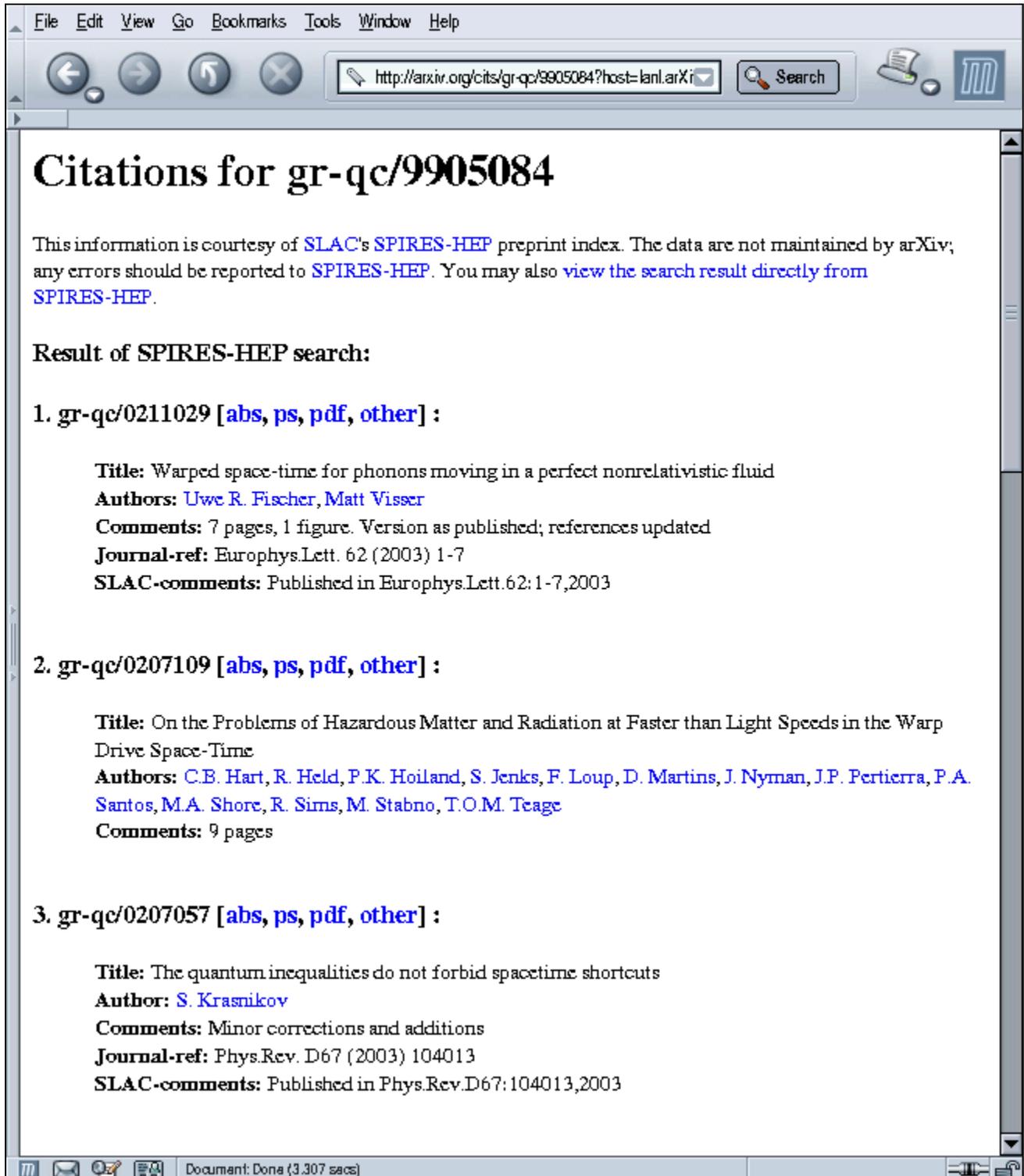


Figure 2. Citations to the Previous Paper



Increased Competitive Pressures

If EconLit does not adapt in this new era, it seems likely that others will, and with time, EconLit could lose both influence and revenue. Already, entities such as Research Papers in Economics (RePEc, <http://repec.org>), described by Cruz and Krichel (1999), and the Social Science Research Network (SSRN, <http://ssrn.com>) have come to play a significant role in many economists' lives as the Internet has risen in prominence. Entry into the EconLit "market" will become easier as more and more journals offer web sites with bibliographic data. This is particularly true if XML is widely adopted as many expect. Extensible Markup Language is a supplement or even replacement for HTML, with which web pages are currently written. Unlike HTML, which does not describe content, in XML one can design "tags" that describe the document's content. Thus, different groups or even individuals can invent tags to best describe their data. This opens up many possibilities. For instance, a web page could have something like

```
<author>Adam Smith</author>
<title>Wealth of Nations</title>
<publication_date>1776</publication_date>
```

where the elements in the brackets inform the software of their contents (they would not be shown to the user). Thus, the appropriate software could easily search for references to Adam Smith just as an *author*, and the resulting extraction into a searchable database would be quite easy (this nicely illustrates one promise of XML and why current search engines are so frustrating—they cannot determine content).

Tag development will likely be done by organizations and associations; Table 1 shows some projects and hints at the interest that XML has initiated.⁹

Table 1: Various XML Projects

ADEX (newspaper classified ads)
<http://xml.coverpages.org/naaClassifiedAds.html>
AML (astronomy)
<http://xml.coverpages.org/aml.html>
BIOML (biopolymer sequences)
<http://65.219.84.5/BioML.html>
CML (chemical notation)
<http://www.xml-cml.org>
FpML (financial derivatives)
<http://www.fpml.org/>
MathML (mathematical notation)
<http://www.w3.org/Math/>

As publishers widely deploy XML, it will be much easier to collect journal bibliographical data with tools like XML::Parser (<http://cpan.uwinnipeg.ca/dist/XML-Parser>). While it will be difficult to replicate all of EconLit in the near term (unless publishers start putting bibliographical data from past years on-line, which in fact some are doing), with time many of EconLit's features will be easier to

duplicate.¹⁰ Thus, with easier entry into its domain, it seems sensible for EconLit to use its unique expertise and resources to expand into other areas and add value in different ways.

E-Mail Delivery of New EconLit Contents

E-mail notification lists of publications and working papers have become an established part of scholarly communication on the Internet.¹¹ Through an electronic mailing list (that is, e-mail sent to a group), subscribers receive periodic announcements about working papers and publications (the exact content depends on the list). Like most electronic mailing lists, subscribers must choose to receive them (or “opt-in”). These lists easily keep one up to date about the latest research. The alternatives are visiting the library to scan new journals, hoping that friends send you relevant working. As the former Director of the National Institutes of Health, Harold Varmus, said (Varmus, 1999) in a different but related context when referring to journals “Finally, their very existence as ‘periodicals’ implies a rhythm that can (in the best of circumstances) stimulate anticipation of forthcoming issues and their contents.”

Notification lists in economics are currently run by many organizations, and to this point the AEA and specifically EconLit have not been participants. Table 2 shows the number of subscribers to some of these entities. New Economic Papers (NEP, <http://nep.repec.org/>) is an outgrowth of RePEc. It lists additions to RePEc by subject area and announces them via mailing lists. Inomics (<http://inomics.com>) runs an Internet search engine for economics, and uses its announcement lists for for job and conference listings. The NBER has electronic mailing lists for its many influential working papers; it supplants its hardcopy *Digest* and *Reporter*. Finally, SSRN, runs notification of both working papers and publications in several areas: ERN (Economics Research Network), FEN (Financial Economics Network), ARN (Accounting Research Network), ISN (Information Systems Network), LSN (Legal Scholarship Network), Management Research Network (MRN), Marketing Research Network (MKN), and the Negotiations Research Network (NEG). It is unclear how much of their business is economics; it does seem to be less commonly used than their financial and legal businesses.

Table 2: E-Mail Notification Services

<u>Organization</u>	<u>Number of subscribers</u>
NEP	9,209 (9/2003)
Inomics	~12,000 (9/2003)
NBER	~15,000 (9/2003)
SSRN	> 30,000 (5/2000)

Many publishers run notification lists for their journals; these include Elsevier, Springer, and Blackwell. No attempt was made to count their subscribers (if indeed the numbers are publicly available). However, taken with their availability and the many subscribers to the lists in Table 2, notification lists have become an established part of the Internet landscape for economists.

An EconLit notification list could run as follows. At the AEA web site, members could choose the *Journal of Economic Literature* categories (used to categorize research categories in the field) they wish to receive notifications about (thus, it would be an “opt-in” system—no one would receive

e-mail they did not wish to receive). Additionally, it would be useful to be able to receive abstracts that meet given keywords to track research outside the chosen category. For example, a labor market economist might not want to follow the econometrics literature, but would want to receive information on panel data econometrics. EconLit works on a monthly production cycle, and when production is finished each month, each section could be released for mailing to interested members.

There would be many benefits to running such a notification service:

- As bibliographical material was removed from the print version of the *Journal of Economic Literature* a few years ago, it is sensible to offer members the ability to easily read about the latest research in their area. Notification lists would serve as a substitute for this depreciated section of the *Journal of Economic Literature*.
- By automatically receiving the list each month, members are more quickly brought up to date about publications in their area by the best available means—EconLit. Further, they do not have to remember to search EconLit for the latest research. The physical analogy is much like a newspaper—the vast majority of people prefer home delivery rather than going to a newspaper machine each day. Another analogy is automatic bill paying—many prefer the convenience and its automatic nature for even the most important bills. In the Internet world, there is some data for which the number of mailing lists is growing faster than the number of web sites—users really do seem to prefer automatic delivery of information.
- The coverage of published material would be broader than any competitor.
- It would aid the AEA to have a greater Internet presence. As described above, other organizations are filling various Internet needs, and a monthly reminder that the AEA is on-line would be a plus.

The costs for this proposal include:

- Formatting the bibliographical material.
Dru Ekwurzel, who runs the office that produced EconLit, does not think that this will be much of a problem as they have extensive expertise in this area. Still, some testing would certainly be prudent.
- E-mailing the information.
As the Executive Committee uses notification lists for other areas, the marginal cost of mailing this material is relatively low. Although more complicated as a member can subscribe to more than one part, interest might be higher than for the other lists. However, the lists for NEP run on a low-end PC.
- The notification lists could be seen as a substitute for EconLit.
They actually serve different markets—EconLit is ideal for literature reviews, which of course go back many years, while notification lists keep one abreast of current research. Putting them together to form a good database would take some years. In addition, if abstracts were kept on the EconLit web site (with the links to them in the e-mailed notification), then the utility of keeping announcements declines. Finally, other organizations, such as SSRN and RePEc have entered this market, and it seems sensible for the Association not to ignore them.

Almost all of the small number of AEA members approached about this idea were enthusiastic. While hardly a reasonable sample, it does indicate interest. If need be, a larger, more formal survey

could be undertaken. Doubtless the idea, and particularly its implementation, needs to be refined, but EconLit e-mail notification lists appear to promise numerous advantages and low cost for the Association and its members. With it, the AEA could join other entities that supply similar services to economists.

Citation Software for EconLit

Perhaps the least enjoyable part of research is putting together a paper's bibliography. While uncommon in economics, this tedious and exacting chore can be automated with software and electronic literature databases. If EconLit was combined with such citation management software, the AEA would have another valuable product.

This paper was originally written in L^AT_EX, and BibT_EX was used to manage its citations and generate the bibliography. Besides BibT_EX, two popular citation managers are EndNote and ProCite.¹² Both operate with Word and WordPerfect, can directly read many literature databases, and generate bibliographies in different formats.¹³

To illustrate how such software works, consider the second sentence of this paper, which in its L^AT_EX format starts with:

Some of these issues were discussed in \citet{Goffe-Parks}, but...

where \citet is BibT_EX -speak for a citation with the key name of Goffe-Parks.

All bibliographic information is kept in a separate BibT_EX file; here is the entry for this source:

```
@article{Goffe-Parks,
  author="William L. Goffe and Robert P. Parks",
  title="The Future Information Infrastructure in Economics",
  journal="The Journal of Economic Perspectives",
  volume="11",
  number="3",
  pages="75--94",
  year="1997"}
```

When L^AT_EX generates the paper, the BibT_EX file is consulted and the above phrase becomes

Some of these issues were discussed in Goffe and Parks (1997), but...

and the bibliography automatically contains

Goffe, W.L. and R.P. Parks (1997). The Future Information Infrastructure in Economics. *The Journal of Economic Perspectives* 11(3),75–94.

All citations for a paper are pulled from the BibT_EX file to generate the correct bibliography. A change in a citation need only be made in the BibT_EX file and it is automatically propagated to all appropriate parts of the paper. The style of the bibliography can be changed in one place as well. Thus, substantial time and tedium, as well as possible errors, are eliminated. The drawback to using BibT_EX or other citation managers in economics is that the author must type (or at best cut and paste from other papers or EconLit) the entries into the BibT_EX (or other master citation) file. In other fields, citation management software directly reads such files from their literature databases.

The AEA would have another product if EconLit's CD-ROM version was adapted to work with citation management software. With such a link, a member could search EconLit for a citation, and when found, it would automatically be put into the bibliography. There would be no need for typing or even cutting and pasting with a mouse, and substantial drudgery and errors would be eliminated. Obviously, this product would tie more economists more tightly to EconLit. One possible complication is that it could take some education to describe to economists. Perhaps a demonstration version of an inexpensive citation manager could be packaged with the CD-ROM version of EconLit to demonstrate its features. Nonetheless, many economists would find it useful.

AEA Journals

While controversial, it is possible to envision AEA journals expanding as they are now on-line. While one might not want to expand, say, the *American Economic Review* and thus perhaps lower its quality, perhaps sections could be added, such as *American Economic Review—Monetary Economics*.¹⁴ While undoubtedly controversial (though much less so if the other journal editors and their boards are brought on board), this could counteract the even less desirable alternative of journals being “locked up” with high and increasing subscription fees at a decreasing number of libraries. This approach would have the added advantage of reducing the increasing rise of specialty societies and journals which ultimately reduce the influence of the AEA. Additionally, the AEA publications would gain further economies of scale.

As described in some detail in Goffe and Parks (1997), there are very good reasons for journals to set up on-line archives of their authors' data and programs.¹⁵ Indeed, five EconLit journals have already done so: the *Economic Journal*, the *Journal of Applied Econometrics*, the *Journal of Business and Economic Statistics*, the *Journal of Money, Credit and Banking*, and the *Federal Reserve Bank of St. Louis Review*. The leading rationale for journal archives is Dewald, Thursby, and Anderson (1986), which found that only 35% of authors asked to supply data and programs by the editor after the paper was written did so, only 15% of supplied data sets were judged to be complete, and just four of nine could be replicated closely. A very recent study, McCullough and Vinod (2003), found even worse data availability for papers from one edition of the *American Economic Review* (and poor replaceability as well). Such archives would not burden already overworked reviewers, but they would provide a strong incentive for authors to carefully check their programs and inspect their data. Interestingly, but not very surprisingly, after his first study, Anderson and Dewald (1994) found “Authors generally found it imposed little burden to submit data and programs with their manuscripts so long as they were aware of the requirement *in advance*.” (Italics added.) Indeed, an on-line archive would simply implement the *AER*'s policy, “It is the policy of the *American Economic Review* to publish papers only if the data used in the analysis are clearly and precisely documented and are readily available to any researcher for purposes of replication.” One would suspect that these five journals have found the same thing. At very little cost to its readers, editors, or reviewers, the accuracy of publications would improve, and with the Association leading the way, journal archives might well become more common to the benefit of the entire profession. In addition, it would clearly be useful to index these sites for those looking for data and programs.

To aid the discussion of economic issues, AEA journals could be augmented with chat rooms or message boards for each article. Questions and comments on articles occur frequently when reading them, yet with traditional technology there is no easy way to act on these thoughts. With a chat room

or message board this limitation could be broached. It would also help eliminate the professional isolation that some economists experience.

Expanded Ties to Internet-Involved Economists

Background

There is already a very substantial networking effort in the profession, and it would be wise for the AEA to begin to establish ties with these groups. These economists have already amassed substantial human capital and made significant achievements, and it would be both wasteful to ignore them and quite expensive to duplicate their efforts. Put another way, as the AEA expands into the on-line world, it seems sensible to at least cooperate with those who have gone before. One entity is the Social Science Research Network, but as it is a profit-making entity, it could be difficult to find areas of common interest, and the incentives may not be compatible.

For example, SSRN currently provides many freely available working papers, but they have the ability to restrict access if they wished (such as in the face of financial pressures). Such an incentive clearly rises if their market share rises. For the first time, the Internet allows academics complete control over the distribution of their work, thus breaking Harnad's "Faustian Bargain."¹⁶ It is a mistake to let others even potentially control the distribution of our works just when a viable, and indeed superior, method has arrived that allows independence.

Another option is a loose-knit group organized around RePEc (<http://repec.org>), a distributed working paper archive described in the next section. Affiliated projects include IDEAS (a site that allows users to query RePEc; data <http://ideas.repec.org>), EconPapers (another search service for RePEc data; <http://econpapers.hhs.se>), NEP (New Economic Papers, <http://nep.repec.org>) a collection of e-mail announcement lists for RePEc, and RAS (RePEc Author Service, <http://authors.repec.org>), where authors can register their identity in the RePEc system.

An important conference on working paper archives was held under the auspices of the Open Archives Initiative (<http://www.openarchives.org>) in Santa Fe in October, 1999. It worked on "a universal service for author self-archived scholarly literature." It was hosted by Los Alamos National Laboratory and additional sponsors included the Council on Library and Information Resources, the Digital Library Federation, and the Scholarly Publishing and Academic Resources Coalition. The 27 invitees included representatives of the NSF, the Mellon Foundation, Harvard, Caltech, the University of California, MIT, and the Library of Congress. The only invitees from the economics profession were Thomas Krichel of RePEc and Bob Parks of the Economics Working Paper Archive at Washington University in St. Louis. Clearly, these economists have established considerable stature (ironically, perhaps more outside the profession than inside), and it would be wise to include them and their considerable Internet expertise in the AEA's plans.¹⁷

One possible area of collaboration would be linking databases of on-line working papers and publications. RePEc would handle the working paper side, and EconLit would deal with the publication side. While it would be difficult to package EconLit into the freely available RePEc data and maintain EconLit's revenue, RePEc data could be incorporated into EconLit. As described by Ellison (2002) publication lags have risen dramatically in the last three decades (roughly since the founding of EconLit), so adding more working paper information to EconLit would offer

considerable benefits to its users. Why should an economist have to search two databases when researching the literature?

Working Papers

The very successful RePEc project (Cruz and Krichel, 1999), (<http://repec.org>), is a sophisticated distributed system for identifying and distributing working papers and other types of economic research (articles, books, book chapters, and software). RePEc offers bibliographical material on 210,000 items of interest to economists, with 109,000 of them on-line. This includes 117,000 working papers and 84,000 journal articles. “Inputs” include bibliographical material from the NBER, the Federal Reserve, the Organisation for Economic Co-operation and Development, and the International Monetary Fund.

There are more than 300 departments and institutions with RePEc sites around the globe. Each site can keep just the information on papers (“metadata”) to save space, or the papers themselves (if available) can be kept for speedy local access. All information is shared between RePEc sites—when one site adds a paper or metadata to its local database, it is automatically propagated to the other RePEc sites. End users do not see RePEc, but instead query its database at sites like IDEAS (<http://ideas.repec.org/>), which is run by Christian Zimmermann of the University of Connecticut, and EconPapers (<http://econpapers.hhs.se/>), which is run by Sune Karlsson of the Stockholm School of Economics. From its inception, there have been more than five million file downloads and 36 million abstract views.

It appears that only one other profession, computer science, has a similar sophisticated system.¹⁸ Trying to replicate or create a parallel system would serve no useful purpose and would actually harm the profession by duplicating existing work and creating confusion. Further, the development of RePEc has taken a fair number of person-years and the AEA does not currently have the requisite expertise in-house.

Fortunately, RePEc is aligned with the interests of academic economists. First, it merely organizes information from more than 300 cooperating department and institution’s servers. Thus, access cannot be restricted without the sponsoring department’s approval. At its core, RePEc is simply an agreement between departments and other entities to share their information in a common format. Also, as a loose-knit organization offering a service to the profession, RePEc does not have stockholders or owners to answer to; rather, they provide a service to fellow economists much like the traditional service work of referring, committee work, and the like. Since the interests are aligned, the AEA should encourage economists and their departments to use RePEc. A more aggressive approach to the AEA and working papers is described next.

AEA Working Paper Site¹⁹

Easily and quickly finding relevant research is a challenge. In the “published” world, it is straightforward, if tedious: follow the appropriate journals. In the arguably more important pre-publication world, this task is considerably more challenging. Often it consists of being well connected, being on the appropriate mailings lists, and following e-mail announcement lists. Even then, important research may well be missed given the often idiosyncratic needs of researchers and the volume of working papers. This is particularly true of research tangential to one’s core area, but still essential (such as the latest research in panel data models for a labor economist). Thus, filtering current

research (in the broadest, not just peer-reviewed sense) is a pressing concern.²⁰ A system with a broader net, yet a finer mesh, would substantially aid AEA members. Fortunately, it appears that just such a system can now be constructed.

This system would use the RePEc database as a foundation and add value for AEA members. First, the complete text of all possible papers would be added (the RePEc database does not contain the complete text of all papers). From there, sophisticated searches of the complete text could be performed. Just as many economists use Internet search engines, they could use this database, say named RePEc+, to perform sophisticated searches of working papers. As described by Cameron (1997) and Ginsparg, Halpern, Lagoze, Harnad, Hall, and Carr (1999), a subsidiary database of citations pulled from the papers could be used for citation filtering—for example, an economist could track all working papers that cite a specific paper. This would be doubly useful if it was integrated with citation linking in EconLit—one could follow all working papers that cite a publication. Further searching could be done by author, *Journal of Economic Literature* code, title, etc. Besides running these searches at arbitrary times, they could be run automatically at user-set intervals and the member informed via e-mail of all matches. Thus, one could receive periodic e-mail updates of personally relevant research.

The AEA could add value in several ways on the “input” side of RePEc (where material is placed into the system) as well. First, it could run a site for members whose home institution does not, so a member could enter his papers into RePEc without local support. This would include a facility where members could e-mail the papers in one of several formats (say Microsoft Word or WordPerfect) and they would be put into the appropriate PDF format for on-line access (RePEc already has workers in the former Soviet Republics who could do this quite inexpensively). Second, systems like PGP Digital Timestamping Service (<http://www.itconsult.co.uk/stamper.htm>), AuthentiDate (<http://www.authentidate.com/>), and Surety (<http://www.surety.com/>) could be integrated into the system to automatically and authoritatively date working papers. Surety.com uses the technology from Haber and Storentta (1992), and presumably the others use something similar. This would serve to help allay fears of making one’s working papers widely available.²¹

Besides searching and citation filtering, RePEc+ could include papers that normally are not freely available, such as the NBER and perhaps even on-line journals. Doubtless, this would involve some extensive negotiations, but the benefits seem clear. Taken as a whole, it is hard to imagine a service that would better implement the “encouragement of perfect freedom of economic discussion” found in the AEA’s charter.

The Appendix describes how adding value to freely available information has become an established Internet business model (as described there, the Linux operating system is perhaps the most famous example). This relationship sometimes involves the fee-based side aiding the freely available side, which is seen as enlightened self-interest. For example, IBM and other computer firms support Linux by providing freely available software for it. In much the same way, perhaps the AEA could help support RePEc, and the AEA would itself benefit.²²

Expanded AEA Directory

The AEA Directory (both the membership survey and membership list) has been on-line for some years, but it could be expanded to encourage membership. As described by Siegfried (1998), membership among academic economists is not particularly high. In research departments, 71% were members; 59% in doctoral departments, and 37% to 59% in liberal arts departments. The printed

Survey of Members lists members by departments. If also on-line, it might encourage more economists to become members as the list would be very public.²³ (This process could be aided by members selecting their department when they renew on-line. One could even imagine each department listing in the on-line directory including both members (with links to their information) and a list of non-members (with no links) to provide further encouragement (non-members could be found from the department web pages). This feature easily could be publicized in the Association's mailings or even its journals to provide even more encouragement.

The AEA might wish to investigate integrating its membership information with the RePEc RAS (RePEc Author Services, <http://authors.repec.org/>) project. It is used to authoritatively link working papers in the RePEc database to specific authors and their contact information. It solves two problems for all papers in the database. First, is Bill Goffe the same person as William L. Goffe? Second, it tracks changes in the author's contact information and even their name. Thus, changes in the institution, e-mail address, homepage URL, or even the author's name are automatically attached to all papers. No longer will one have to track down the new institution or contact information of an author of an old paper. Already, more than 5,800 economists have registered with RAS.

Economics Referee Database

Another possible product for the AEA would be a referee database; but as described below, its greatest benefit might be reducing the social costs of refereeing. Following the review of a paper, the referee reports would be placed in this database. If the paper is rejected by an AEA journal, this database could be consulted by other journals, so it need not be sent out for another review. In fact, the original referees might suggest a more appropriate journal if they recommend rejection. The author benefits since the paper need only be reviewed once. To deal with bad reviews, it would be sensible to allow the author to comment on the review and to request another review (of course, the latter would come at the cost of an additional delay).

This is something of a superset of an idea in Varian, Deaton, Goffe, Ekwurzel, Parks, and McMillan (October 2000). It describes how the *Journal of the American Medical Association* follows a similar procedure at the request of the author, who may request a submission to a specialized sister journals upon rejection. The idea proposed here, in its most general form, is not unlike Berkeley Electronic Press (<http://www.bepress.com/>) where papers are given different rankings inside their journals based on their perceived quality from one review.

There are several permutations that might be considered. The papers might be submitted electronically so that they can be automatically compared to others in the database. Thus, mere title changes could be detected between submissions, or more serious copying of works (either of parts of the author's own works, or the works of others) could be detected. This comparison could be integrated into software used to run the "back office" of journals. Another permutation is that rather than this being run for AEA revenue, it could be run by a consortium of economics journals.

Doubtless this is a controversial suggestion, but it would seem to have many benefits. Chief among them would be reducing the social costs of refereeing and speeding up the publication process. As described above, there should be some options to protect the author from bad reviews. While this is more speculative and longer-term than the rest of this paper, one point is clear—it shows how the Internet may dramatically change the way we work.

Resources for Economists on the Internet

Resources for Economists on the Internet (RFE, <http://rfe.org>) lists some more than 1,300 Internet resources of likely interest to economists. As an Internet-only resource, RFE must evolve to meet its users' rapidly changing needs. Fortunately, this evolution is not hampered by a paper version. Some parts of the guide are fairly complete, such as the listing of economics publishers, working papers sites, software, and U.S. macro data. Other areas need to be expanded, such as the conference listings and non-U.S. data sections.

A long-term goal is to change the format of the most popular part of RFE, its data section. Currently, RFE is organized hierarchically, much like Yahoo!. This format should make the structure immediately familiar to users, and of course it is a reasonable way to arrange information.²⁴ While this format works well for much of the guide, it is not optimal for the data section. Data often has three fairly unique attributes: its location (often data is located at more than one site), the actual series (not all locations have all series), and its collection (the entity that holds the actual series). For example, U.S. real GDP is part of the U.S. National Income and Product Accounts and is located at several different sites, which serve the needs of different users. (Of course, there are other attributes as well, such as the length of the series.) These three separate attributes would seem to fit well into a relational database scheme where three separate tables are used to house the different sets of information.²⁵ In such a framework with the appropriate user interface, users could very easily find the exact data they wished. To further organize economic data for economists, it would also be useful to catalog the universe of economic data into some ten or twenty different categories (national income and product accounts, regional data, longitudinal surveys, household census, etc.). This catalog system would be similar to *Journal of Economic Literature* categories. Needless to say, this will require considerable thought and deliberation, but the benefits for economists looking for data would be immense. One possible model would be the categorization system employed by Statistics Canada since they are their sole generator of government statistical data.

Annual Meeting

As using networks becomes more common, paradoxically meeting in person ("meatspace") becomes more important. As described in Goldberg (1999) when he quotes William J. Mitchell of MIT, "'The more electronic communication expands and diversifies our circle of contacts, the more we're going to want to add the dimension of face-to-face,...'" Put another way, "'periods of face-to-face which serve to build trust and commitment'" are an essential adjunct to on-line communication. Oddly enough, "The convention business in the United States is booming, industry spokesmen say, and the boom is coming not only from the robust economy but also from an unexpected byproduct of the Internet: the growing desire of people who connect in on-line communities to gather in what some call 'meatspace,' the opposite of cyberspace, if only once a year." This point was brought home to me a few years ago when I was asked to introduce two researchers to each other at a conference cocktail party. They had conversed via e-mail for some time, but literally did not know each other's face. When I introduced them, they met like the good friends that they were, and one could see their relationship almost magically being extended.

The AEA could use this opportunity to expand its annual meeting with a greater variety of and different format to sessions. With a greater appeal to economists, the increase in revenues could be used to offset the impact of increased on-line activities such as expanding EconLit, or RePEc+.

While the AEA splits revenue from the ASSA conference with other associations, one would suspect that they would not be averse to a rise in revenue.

Below is a listing of how the AEA component of the ASSA Meeting compares to nine other large scholarly meetings of recent years. The focus here is both on the content of sessions (research topics, teaching, professional development, etc.) and how that material is presented (“regular” sessions where scholarly papers are presented, roundtables, poster sessions, discussions, debates, etc.). The conferences are somewhat hard to compare due to differences in nomenclature and detail of their programs. Plus, needs vary by fields; for example, there would appear to be many practicing chemists who need to learn the latest techniques. Still the comparison is instructive—economists appear to have the least varied meeting format with the heaviest reliance on presentation of research papers.

American Economic Association, January 7-9, 2000²⁶

- 127 Unique sessions (including co-sponsored sessions)
- 92% Regular sessions
- 6% Education (all formats)
- 5% Roundtables
- 2% Panels
- 1% Lectures
- 1% Posters

American Accounting Association 1999, August 15-18, 1999²⁷

- 149 Sessions
- 59% Regular sessions
- 27% “Continuing Education”²⁸
- 9% Education
- 2% Professional development
- 1% Panels
- 1% Plenary

American Association for the Advancement of Science, January 21-26, 1999²⁹

- 153 Sessions
- 72% “Scientific Symposia” (3 hours, 4-5 speakers)
- 16% “Topical Lectures”—single talks³⁰
- 7% “Science Innovation Symposia”³¹
- 5% “Plenary Lectures”
- Other: 2 seminars of 1.5 - 2 day length

American Astronomy Association, June 1999^{32 33}

104 Sessions

68% Regular sessions

10% Special sessions (example: "Next Generation Space Telescope")

8% Topical (latest results)

7% Invited sessions

7% "Solar Special" (conference theme?)

American Chemical Society, August 22-26, 1999³⁴

607 sessions

86% "Technical Program"

7% "Short Courses"—1/2 day sessions³⁵

7% "Workshops"—1/2 day sessions³⁶

American Philosophical Association 1999, March 31 - April 3, 1999^{37 38}

99 Sessions

76% Regular sessions

13% Symposia (details unclear)

3% Invited papers (one per session)

7% Author meets critics

1% Education

American Political Science Association, September 2-5, 1999³⁹

687 Sessions

84% Regular sessions

12% Roundtable

2% Education

2% Short courses⁴⁰

American Sociological Association, Aug. 6-10, 1999⁴¹

278 Sessions

64% Regular sessions

21% "Special sessions"⁴²

4% "Open Refereed Roundtables"⁴³

4% Poster sessions

3% "Research Support Forum" sessions

2% Informal discussion sessions

2% Book panels⁴⁴

Joint Mathematics Meetings, January 19-22, 2000^{45 46}

- 260 Sessions
- 45% Regular sessions
- 27% Education (4% panels, 4% minicourses)
- 11% Lectures, addresses, invited talks
- 7% “Minicourses”
- 3% Professional development (1% panels)
- 2% Poster sessions
- 2% “Short Courses”
- 1% “Workshops”
- 1% “Panels”

Modern Language Association, December 27-30, 1999^{47 48}

- 833 Sessions
- 84% Regular sessions
- 9% “The Profession”
- 4% “Teaching of Language and Literature”
- 2% Roundtable
- 1% “Electronic Techniques in Teaching and Research”

When the percentage of regular sessions is examined, every association listed above has a more varied conference format than the AEA. Their greater variety may well lead to greater participation and thus interest and attendance. Other conferences had many more roundtables, short courses, panels, workshops, topical lectures, authors meeting critics, poster sessions, and sessions on education and teaching, as well as professional development. The current AEA Meeting format leads to a low level of participation; at the 2000 AEA meeting (Allied Social Science Associations Program, 2000), there were some 126 “regular” sessions, and assuming 3.5 papers per session, then some 441 presentations were made (some 1,312 were made for the entire ASSA). According to Siegfried (1999), approximately 8,500 attended the 1999 meeting, so some 15% of attendees participated by making presentations in the entire ASSA meeting.

It would appear that the degree of participation of the meeting is similar to the degree of participation economics instructors use when they teach—low (Siegfried, Saunders, Stinar, & Zhang, 1996). There are reports that other disciplines use more participatory teaching techniques, and it seems to mirror their conference formats. If the AEA Meeting topics become broader and more participatory, interest and attendance could well rise. The current format has a very heavy reliance on 3 or 4 papers with discussants where the modal audience member has no input. Following the lead of other academic conferences, authors of major papers could meet and debate their critics, there could be more roundtable discussions on current topics, and “luminaries” could lead tutorials or workshops on the latest research methods. One would suspect that they would not be averse to the exposure, and perhaps more lectures could be named for notable economists in that area to make them even more enticing. There could also be an increased emphasis on teaching as its importance has risen in academia, and of course is very important in the professional lives of many AEA members (some evidence comes from the low publication count of the typical economist; see Hutchinson and Zivney (1995)).

As the meeting registration fee is a small share of the expense of the meeting, and meeting substitutes are scarce, one would suspect that the elasticity of demand with respect to the meeting registration fee is relatively inelastic. The “meatspace” phenomena could well add to this inelasticity. Thus, increased meeting fees could be used to offset Internet activities. Changing the format of the meeting is potentially quite easy as the program is at the discretion of the incoming President (but, one would suspect that tradition plays something of a role). If the decision is made to change the program, perhaps some of these ideas could be implemented on a trial basis to avoid the risks inherent with a sudden change.

Summary of Suggestions

This section summarizes the paper’s main suggestions. Much detail is necessarily missing, and if read in isolation this section is not likely to be convincing. Some of the proposals are doubtless controversial.

- EconLit could include forward citations.
- Potential competitors to EconLit should be followed closely.
- New EconLit contents could be delivered to members via e-mail on a monthly basis.
- Citation software to easily pull EconLit contents into economists’ papers should be investigated.
- Consider the possibility of expanding the *American Economic Review* with sections devoted to various subfields.
- Set up on-line archives for data and programs for the Association’s journals. For the *AER*, this would implement current editorial policy that data and their processing should be available to researchers.
- The Association should expand ties to economists already providing Internet services to economists.
- To promote the use of on-line working papers, the AEA should set up a RePEc working papers site. To better serve its members in an era when research is increasingly difficult to easily find, it should consider helping set up an expanded RePEc database (“RePEc+”) for filtering current research for its members. Funding for RePEc should be explored.
- The on-line AEA Directory should be expanded both to support members and to encourage membership.
- A database for referee reports to reduce the social costs of refereeing should be investigated.
- RFE should continue to expand and evolve to serve the needs of economists.
- The format of the annual meeting could be expanded to increase revenue, to make it more relevant, and to make it a better place to extend on-line collegiality.
- Consider both a marketing study for new products and a strategic plans with long term goals and timetables.

Conclusion

This paper surveys many different aspects of how the Internet will affect the American Economic Association. Many of these changes directly affect the Association and its activities: its journals, the continued preeminence of EconLit, the AEA Directory, and the annual meeting. To maintain a consistent level of services to its members, these entities will need to adopt the Internet more fully. The AEA may even wish to expand with major new services.

In making decisions to offer new products, it would be advisable to undertake marketing studies. These need not be expensive or long-term, but they should certainly survey members to ensure that their needs are met. These results are likely to be more insightful than relying on a few opinions or hunches. Of course, these results should be balanced against the cost of these proposed initiatives.

Since these challenges are so wide-ranging and long-term, it would be very useful to write and then implement a strategic plan with specific goals and timetables. The plan would lay out specific responsibilities for the different entities in the Association.

The AEA charter provides a useful background for the proposals advocated here. It calls for the “encouragement of economic research” and the “encouragement of perfect freedom of economic discussion.” Decreased communication costs due to the Internet and increasingly powerful computers and software will aid the first goal and bring the second closer to its fruition. Yet, these changes can only be fully realized if the AEA completely incorporates the Internet into its operations. In addition, as the Internet becomes more prominently used in research, the AEA should follow its members into more complete use of the Internet. This will maintain the level of services that they have come to expect.

The AEA has faced various challenges as the research environment evolved in the past. EconLit helped economists cope with a rapidly expanding literature, and the *Journal of Economic Perspectives* arose from a need for a journal to help bridge an increasingly specialized profession. In much the same way, the Internet poses challenges for today. While others could certainly provide some of the services listed here, it might be best not to be beholden to those who sometimes seem to extract large profits from the academic market. The AEA’s non-profit status gives it a different incentive. Also, as the largest professional society, it has both substantial resources and an implicit leadership role in the economics profession. Thus the AEA could play a unique role as the profession moves to more complete use of the Internet.

Appendix: Adding Value to Freely Available Information

Adding value to freely available information has become an established Internet business model. Many of these rely on “open source” software—software whose source code is freely available and can be modified. Since many programmers can read it, it is sometimes called “massive peer-review.” Cygnus Software (owned by RedHat) has long supported and added value to the open source Unix “GNU” software. RedHat itself uses this model; they survive by offering technical support for their freely available Linux software. The freely available “Sendmail” software is used to send and receive a majority of the e-mail on the Internet, and besides the open source version, Sendmail Inc. sells support and various features that add value.

Endnotes

¹This archive was founded by Paul Ginsparg when he was at Los Alamos National Laboratory, but he and the archive have since moved to Cornell.

²One interesting project working against the Faustian Grip is Ted Bergstrom's "Lysistratan Scheme" where he announced that he will not review for journals with university subscription rates greater than \$1,000 and he prefers to review for those with rates below \$300.

³He further wondered why he bothered to publish anymore in paper himself.

⁴There is some double counting in these figures.

⁵While some complain about the costs of computers and Internet connections, they pale in comparison to the cost of a useful library.

⁶A bit of data on this point comes from a comparison of the AEA's journal prices and some commercial publishers' prices.

⁷Also note that links to revisions to this paper are found here.

⁸Bob Parks deserves credit for bringing this idea to my attention.

⁹Another metric is that *XML for Dummies* is now in its third edition.

¹⁰If this technology was allied with Heck's "Economic Literature Database" for past citations and priced at marginal cost, the threat would be more immediate. Of course, Heck's does not have the coverage of EconLit nor does it contain abstracts, but it could be more competitive with this technology.

¹¹As this topic has been broached, I wondered about its inclusion in this paper, but ultimately decided to include it to make this discussion complete.

¹²Both are rather expensive, but there are numerous less expensive alternatives.

¹³This latter feature would be particularly useful in economics.

¹⁴This would be much like *Physical Review A* to *Physical Review E* from the American Physical Society.

¹⁵This argument is now obsolete as the in April 2004 the AER announced it will generally require empirical papers to submit their data into an on-line archive.

¹⁶Harnad (1995) describes how until the Internet academics allowed publishers to restrict access to their works in return for their distribution. He argues that today, academics can retain control, allowing for a wider distribution of their ideas upon which their reputation stands.

¹⁷Note that Bob Parks now serves on the AEA's Electronic Publications Committee, but the relationship could clearly be extended to others and deepened with joint projects.

¹⁸ArXiv.org is "simpler" as it is not distributed and handles only working papers, while the computer science system, NCSTRL, is much smaller with 26,000 papers.

¹⁹This section may be obsolete with the recent work (as of April 2004) between the AEA and RePEc.

²⁰Such filtering is a large part of what we do, but the actual process is nearly subconscious.

²¹As a practical matter, cases of plagiarism are very likely to be detected by reviewers and readers given the degree of specialization in economics.

²²RePEc is not "shopping" for support, but it could offer more services with a small amount of additional resources. Ironically, a benefit to RePEc's being relatively resource poor is that it has learned to do a great deal with limited resources, which makes it possible for their information to be freely available.

²³According to John Siegfried, there are often more members in the year when the *Survey of Members* is published.

²⁴It is not strictly hierarchical as resources that "fit" in more than one section are copied to other appropriate sections.

²⁵It is hardly an exaggeration to say that much of the world runs on relational databases; for example, the world's second largest software firm, Oracle, is the leading supplier of relational database software, but they are estimated to at best have a bare majority market share.

²⁶*Allied Social Science Associations Program, 2000.*

²⁷American Accounting Association 1999 Annual Meeting,
<http://www.rutgers.edu/Accounting/raw/aaa/99annual/meeting99.htm>.

²⁸These have a scholarly orientation; topics include how to use panel data sets, etc. All these sessions are fee-based.

²⁹The 1999 AAAS Annual Meeting and Science Innovation Exposition, <http://www.aaas.org/meetings/1999/program/sessions.htm>.

³⁰One example was Jared M. Diamond, UCLA, “A Short History of Everybody for the Last 13,000 Years.”

³¹These are on various “hot topics.”

³²This is one of two meetings a year.

³³AAS Meeting #194, <http://www.aas.org/publications/baas/v31n3/aas194/SL.htm>.

³⁴218th ACS National Meeting August, <http://www.acs.org/meetings/neworleans99/>.

³⁵An example was “Statistical Analysis of Laboratory Data.”

³⁶An example was “Modern Applications of Scanning Probe Microscopy”

³⁷Pacific Division Meeting—there appears to be no national meeting.

³⁸American Philosophical Association Pacific Division Meeting, <http://www.apa.udel.edu/apa/divisions/pacific/1999meet/index.html>.

³⁹The full program is no longer available on-line.

⁴⁰These cover various topics: bootstrapping, advising pre-law students, etc.

⁴¹95th Annual Meeting, American Sociological Association, <http://www.asanet.org/convention/homepage.html>.

⁴²“Special Sessions feature invited paper presenters or panelists on topics that further investigate the meeting theme or focus attention on other timely and important issues.”

⁴³“...a mini-session format: a general topic identified for each table, two to five paper presentations, and a table presider to coordinate presentations and discussion.”

⁴⁴Significant books are discussed with the author.

⁴⁵The American Mathematical Society and the Mathematical Association of America have the vast majority of sessions.

⁴⁶Joint Mathematics Meetings Full Program, http://www.ams.org/amsmtgs/2026_progfull.html.

⁴⁷The sessions were wide-ranging; one was titled “Deficit Poetics: J.M. Keynes and Modernism,” which included “The Keynesian National Object: Late Modernism and The General Theory,” “Culture, Credit, and Divorce: William Carlos Williams and W.E.B Du Bois Imagine New Americas,” and “Joycean Deficit Poetics.” At least one paper was even more farther afield, but the title is not repeatable.

⁴⁸*PMLA, Publications of the Modern Language Association of America, Program of the 1998 Convention, 27-30 December, San Francisco, California*, vol. 113, no. 6.

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