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What evidence should social policymakers use?

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Policymakers seeking empirical evidence on social policy interventions often find themselves confronted with a mountain of academic studies that are potentially relevant to the question. Without some systematic way to sort through the evidence, there is a risk that analysts will become mired in the research, or simply cherry-pick those studies that support their prior beliefs. An alternative approach is to test each study against a hierarchy of research methods. This article discusses two hierarchies — one used by US medical researchers, and another used by UK social policymakers — and suggests one possible hierarchy for Australia. Naturally, such a hierarchy should not be the only tool used to assess research, and should be used in conjunction with other factors, such as the ranking of the journal in which a study is published. But used carefully, a hierarchy can help policymakers sort through a daunting body of research, and may also inform governments' decisions on how to evaluate social policy interventions.

1 The author is from Social Policy Division, the Australian Treasury. This article has benefited from comments and suggestions provided by Peta Furnell, Jenny Gordon, Angelia Grant, Harry Greenwell, Jason McDonald, Bronwyn Michael, Terry O'Brien, Hector Thompson, Leo Vance and Joann Wilkie. The views in this article are those of the author and not necessarily those of the Australian Treasury.

Introduction

Imagine a diligent policymaker decided that before providing advice on a particular social policy question, she was going to read all the relevant academic literature. Being a fast reader, she envisaged spending half an hour on each article that *Google Scholar* determined to be relevant to the question at hand. How long would this take?

Reading solidly for 40 hours a week, 52 weeks a year, it would take a policymaker 18 months to get through the 6,000 articles on 'early childhood intervention', four years to get through the 16,000 articles on 'teacher quality', or five years to get through the 20,000 articles on 'social housing'. Moreover, given that more articles are being written all the time, this probably underestimates the time that would need to be devoted to understanding even such narrowly defined topics as these.

Across the social sciences, the explosion of research over recent decades shows no signs of abating.[2] The ready availability of working papers, the creation of new journals, and the continued production of new books makes it harder than ever before for the consumers of research to keep up with the burgeoning supply.

With the exception of those who work in an extremely narrow field, it is now virtually impossible for policymakers to read everything that has been written on their topic. For those who are committed to the notion of 'evidence-based policymaking', this presents a considerable challenge. Good policymakers should consider theory, context and risk (see Wilkie and Grant, this issue). Then they must ask: what is the most efficient way to sift through the available evidence? With such an abundance of evidence, there is a risk that advocates will simply 'cherry-pick' the studies that suit their worldview, conveniently ignoring those that do not.[3]

In medicine, the generally accepted solution to this problem is to use what is known as an 'evidence hierarchy', by which evidence is ranked according to a set of methodological criteria. Doctors are then encouraged to give more weight to high-quality research, and less weight to low-quality research.

This article suggests that when it comes to interpreting impact evaluations, social policymakers may benefit from applying the same approach. Although there is more debate about appropriate methodologies in economics than there is in medicine, it is

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2 Indeed, just reading the 4,000 articles containing the phrase 'explosion of research' would take our hypothetical policymaker about a year.

3 The cost that a proliferation of low-quality evidence can impose is illustrated by John Donohue: 'Going from 10 great empirical studies a year to 200 constitutes great progress, but going from 100 worthless studies a year to 1,000 breeds an often well-deserved cynicism about the value of empirical research, even though the percentage of valuable studies has risen considerably.' (Donohue 2001, p 4).

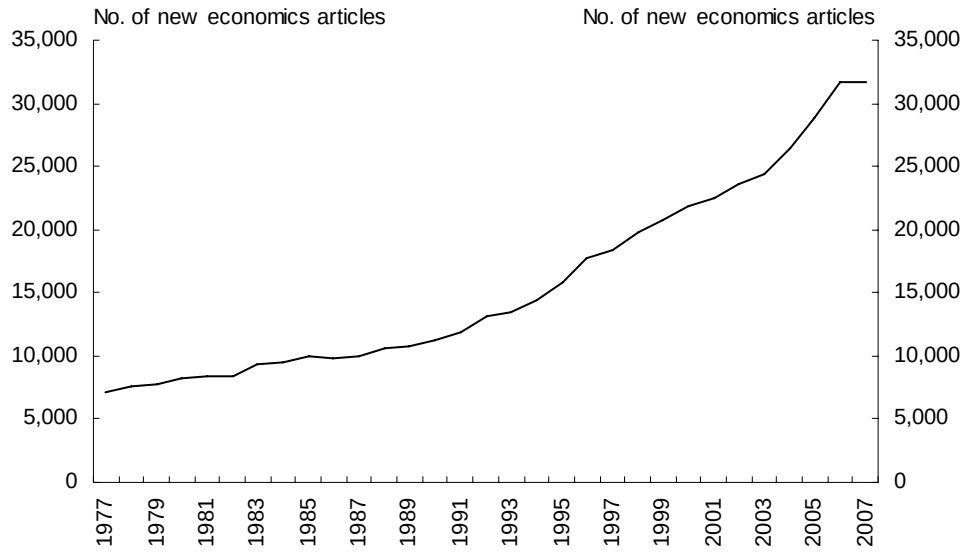
nonetheless possible to identify a set of broad principles that can help shape an appropriate evidence hierarchy for economic research. Where doubt still remains, journal rankings can also be instructive in assisting policymakers decide how to weight multiple pieces of evidence.

At the outset, a caveat is in order. Although process evaluations and qualitative evidence can also be important, this article will focus on impact evaluations using quantitative evidence. Furthermore, this article focuses solely on policymaking in the social policy field (including education, health, income support and crime). In fields such as defence policy and monetary policy, a different hierarchy may be appropriate.

Climbing the research mountain

A sense of the challenge facing policymakers can be gleaned from the Econlit database, which indexes new economic research. Figure 1 charts the number of new articles published in Econlit over a 30-year period. In 1977, there were 7,077 articles published in the database. In 2007, there were 31,633 new articles, more than four times as many. In part, this is due to an increase in the number of available journals. For example, the Berkeley Electronic Press has established 19 journals in business and economics in the last decade. This year, the American Economic Association has launched four new journals. With the growing acceptance of journals which publish only online, it is likely that the number of outlets will continue to increase.

Chart 1: A growing body of research[(a)]



Source: Author's calculations, based on year-by-year searches of www.econlit.org

If the sheer volume of research was not daunting enough, today's research is also more accessible than ever before. Given that most journals can be accessed electronically, one can no longer make the excuse that a highly pertinent article has been overlooked solely because a hard copy was not available in the library. In addition, many economics papers now receive wide circulation prior to being published in a peer-reviewed journal, which creates its own challenge for the consumers of academic research. Similar trends are evident in other social sciences, with the numbers of journals and articles rapidly increasing in sociology, education policy, political science and health policy.

How might a hierarchy look?

One way to sift through the available evidence is to devise an evidence hierarchy, borrowing from the approach commonly used by medical researchers. For example, a report from the US government 'Preventive Services Task Force' sets out a hierarchy that is routinely followed in the medical profession (see US Preventive Services Task Force 2008, Section 4).

Box 1: The US Government's evidence hierarchy for medical research

I: Properly powered and conducted randomised controlled trial (RCT); well conducted systematic review or meta-analysis of homogeneous RCTs

II-1: Well-designed controlled trial without randomisation

II-2: Well-designed cohort or case-control analytic study

II-3: Multiple time series with or without the intervention; dramatic results from uncontrolled experiments

III: Opinions of respected authorities, based on clinical experience; descriptive studies or case reports; reports of expert committees

In the social policy context, the UK Cabinet Office has sought to adapt the medical schema for the use of policymakers who are considering interventions that might assist vulnerable individuals.[4] They propose the hierarchy set out below.

Box 2: The UK Government's evidence hierarchy for policymakers

1. Systematic review — Synthesis of results from several studies

2. Randomised controlled trial — Population allocated randomly to groups

3. Quasi-experimental study — Similar populations compared

4. Pre-post study — Results compared before and after intervention

One feature that characterises both the US medical hierarchy and the UK social policy hierarchy is the precedence given to systematic reviews. Systematic reviews (also known as meta-analyses) allow researchers to quickly gain a sense of the preponderance of evidence on a particular topic, without having to read each of the studies in a field. This is particularly valuable if the literature is comprised of many well-designed studies with small sample sizes. Taken individually, these studies may reach divergent conclusions, but by aggregating them, it is often possible to get above the trees and see the shape of the forest. Another issue is that systematic reviews are only as good as the studies being aggregated (if the individual studies are flawed, then

4 Social Exclusion Task Force (2008). Although it is difficult to be sure of the impact that the UK hierarchy has had on the decision-making process, it has been widely discussed (as evidenced by the fact that a Google search on the title brings up over 20,000 hits). For a broad discussion of grading social policy evaluations, see Boruch and Rui (2008).

combining them will not solve the problem). Some systematic reviews address this issue by explicitly placing more emphasis on higher-quality studies.[5]

Another point to note is that the above hierarchies adopt a similar ranking of research types, putting randomised trials above natural experiments, which in turn are placed above before-after studies. Underlying this classification is the credibility of the *counterfactual* — what would have occurred in the absence of the intervention. In an ideal study, we would like to be able to compare the treatment group, who received the intervention, with a control group of individuals who did not receive the intervention.

In a randomised trial of a new pharmaceutical, participants are informed in advance that they will have a 50 per cent chance of receiving the new drug, and a 50 per cent chance of receiving a placebo (such as a sugar tablet). Typically, the study is set up in such a way that neither the participants nor the person administering the experiment is aware of who is in the treatment group and who is in the control group. This is known as a double-blind randomisation.

In a randomised policy trial, participants are almost always aware of whether they are in the treatment group or the control group. For example, in a 1999 randomised trial to evaluate the efficacy of the NSW Drug Court, individuals who were awaiting trial on a drug offence were randomly allocated either to a regular court, or to the new Drug Court (Lind et al. 2002). By matching participants to court records over the next year, the researchers were able to see whether the sentencing approach had an impact on recidivism. (It turned out that those who were assigned to the Drug Court were significantly less likely to commit a drug-related offence in the following year).

With a sufficiently large sample, assigning individuals to the treatment or control group by randomisation ensures that the two groups are evenly matched. With randomisation, the two groups should have similar observable characteristics (such as education or income), and similar unobservable characteristics (such as motivation or self-control). This is a major advantage over multiple regression approaches which make it possible to hold constant observable traits, but not unobservables. For this reason, randomised trials are known as the 'gold standard' in policy research, and have informed policymaking in areas as diverse as job training, driver education, school vouchers, financial assistance to ex-prisoners, welfare reform, health insurance and rental subsidies (for a discussion, see Leigh 2003, Farrelly 2008). Yet randomised policy trials remain relatively rare, with 24 medical randomised trials being conducted

5 See for example the work of the Campbell Collaboration (www.campbellcollaboration.org), which prepares systematic reviews in the areas of education, criminal justice and social welfare.

for each randomised policy trial (The Economist 2002). This may reflect a lack of familiarity with the technique, or a perception of randomised policy trials as being unethical, because those in the control group do not receive a potentially effective intervention.[6]

In the evidence hierarchy, natural experiments are the next category below randomised trials.[7] Also known as 'quasi-experiments', these approaches construct the counterfactual in various ways. 'Differences-in-differences' identifies a similar population that is not affected by the treatment, and tracks the outcomes of the treated and control groups over time. For example, suppose that a government decided to increase garbage collection fees in order to reduce landfill. In order to assess the impact of the change, we might compare the amount of garbage collected in two neighbouring areas — Town A (which is just inside the affected area) and Town B (just outside the affected area). With measures of the outcome measure (garbage volume) for two cities (treatment and control) in two time periods (before and after) one can estimate the policy impact by comparing the change over time in the control group with the change over time in the treatment group. Unlike a cross-sectional comparison (comparing Towns A and B after the policy change), differences-in-differences is able to account for persistent factors that might confound the analysis (Town A's residents might be more prone to littering). And unlike a before-after comparison (looking at Town A before and after the policy change), the strategy is able to account for other time-specific shocks (for example, there might be seasonal patterns of garbage disposal).

Another commonly-used natural experiment approach is regression discontinuity. This research method compares individuals who are very close to an arbitrary cutoff, such as an entry score or an eligibility threshold. Inherent in this strategy is that the closer one comes to the cutoff, the more similar those on either side are to one another. For example, suppose an individual must score 90 per cent to be admitted into a selective school. We would probably expect students scoring 50 per cent to be very different from students scoring 99 per cent (on both observable and unobservable characteristics). However, as we come closer to the cutoff, students are likely to be more similar. A regression discontinuity approach might compare those who scored 90 per cent with those who scored 89 per cent. Since only one point separates these individuals, it is plausible to imagine that it was only a matter of luck that one student scored above the threshold and the other below it. The assumption underlying regression discontinuity — that individuals who are very close to an arbitrary

6 On the issue of ethics, social policy evaluation has much to learn from medical evaluations, including public health randomised trials such as the NSW Head Injury Retrieval Trial.

7 Two recent review articles on quasi-experimental techniques, both written from an Australian perspective, are Cobb-Clark and Crossley (2003) and Borland, Tseng and Wilkins (2005).

threshold are likely to be alike — suggests that students who just fail to meet the cutoff might be a good control group for those who narrowly exceed the cutoff. In this example, one could use regression discontinuity to see whether students who attend a selective school eventually perform better on university entrance exams.[8]

Another set of natural experiments use multiple regression or matching approaches to control for observable differences between the treatment and control groups. For example, an evaluation of pre-school education programs in the UK (the Effective Provision of Pre-School Education project) compares the outcomes for children who were enrolled in pre-school with children who were not enrolled in pre-school, but who had similar observable characteristics.[9] The limitation of this strategy is that there may be unobservable traits about families who chose not to use pre-school programs. If these traits also affect child outcomes, then the matched control group will not constitute a valid counterfactual for the treatment group.

Before-after studies rank below systematic reviews, randomised trials and natural experiments. Implicit in a before-after study is that if the intervention did not take place, the outcomes in the after period would be precisely the same as they were before the intervention. Put another way, the counterfactual in a before-after study is what we observe before the intervention. This is a strong assumption, which will be violated if there are other factors affecting outcomes over time (such as rising productivity, other policy changes, or fluctuating economic cycles).

Lowest in the medical hierarchy (and not even rating a mention in the UK Cabinet Office's hierarchy) are expert opinions and descriptive case studies. From a policymaking perspective, this may include first-principles analyses, based purely upon theory; or anecdotes about the effectiveness of particular policies. Sometimes this evidence is all that is available; but the above hierarchies suggest that where possible, it should be supplemented by empirical findings.

Drawing this together, the following hierarchy might be used by social policymakers in Australia.

8 For a regression discontinuity study of this type, see Clark (2007).
9 For more information, see the EPPE website, at www.ioe.ac.uk/schools/ecpe/eppe/

Box 3: A possible evidence hierarchy for Australian policymakers

1. Systematic reviews (meta-analyses) of multiple randomised trials

2. High quality randomised trials

3. Systematic reviews (meta-analyses) of natural experiments and before-after studies

4. Natural experiments (quasi-experiments) using techniques such as differences-in-differences, regression discontinuity, matching, or multiple regression

5. Before-after (pre-post) studies

6. Expert opinion and theoretical conjecture

All else equal, studies should also be preferred if they are published in high-quality journals, if they use Australian data, if they are published more recently, and if they are more similar to the policy under consideration.

Other relevant considerations

The principal value of an evidence hierarchy is as a rule-of-thumb, which can help simplify the process of classifying a large body of empirical evidence. However, one limitation of an evidence hierarchy in the social sciences is that some methodologies are better-suited to answering different types of questions. In particular, while randomised policy trials are an effective way of testing the impact of an intervention on a small scale, randomisation is often unable to provide estimates of the 'general equilibrium' impact of a policy change. For example, the Moving to Opportunity rental assistance experiments in the US (Kling, Liebman and Katz 2007) were designed to test the impact on individuals of moving out of a high-poverty neighbourhood. As a randomised experiment, it has provided credible estimates of the impact of moving to a better neighbourhood. But because of the way the study was designed, it does not measure the impact of mobility on the families who are left behind. It is therefore possible that some of the gains for movers are offset by losses for the old friends and neighbours that they left behind.

Medical researchers are typically less concerned about general equilibrium effects. If a new pharmaceutical is effective in a small sample, then it will most likely 'scale up' to the full population. But economists are often concerned about spillover and scale effects, and in such cases, it may be valuable to be able to have evidence from both a randomised trial and a natural experiment. In other cases, randomisation may be

unfeasible — either for practical or ethical reasons — in which case, it is necessary to opt for other evaluation methods.[10]

What other factors should be borne in mind when assessing research evidence? All else equal, policymakers will typically give greater weight to more recent studies, to Australian studies, and to evaluations of policies that are most similar to those under consideration. Additionally, some may find it useful to refer to the 13-question checklist prepared by the UK Cabinet Office for evaluating randomised trials, natural experiments and qualitative studies.[11]

A final consideration in the case of published studies is that policymakers may also wish to give more weight to research that is published in more highly-ranked journals. Although journal rankings are not a perfect guide to the quality of an individual article, those studies that use rigorous methodologies are more likely to find their way into the best journals. One such ranking, compiled by Kalaitzidakis, Mamuneas, and Stengos (2003), ranks 159 journals using citation data from 1994-98, including three Australian journals, the *Economic Record* (58th), the *Australian Economic History Review* (82nd) and the *Australian Journal of Agricultural and Resource Economics* (103rd). (The citation database that they used omitted some Australian journals, including the *Australian Economic Review*, *Australian Economic Papers*, and *Economic Papers*.) While reasonable economists might disagree on the margins, most would concur that an article published in a top-20 journal should be given greater weight by policymakers than an unpublished working paper, or a study published in a journal ranked below 100. The full ranking is provided in the Appendix.

10 For an (in)famous example, see Smith and Pell (2003), who conduct a tongue-in-cheek systematic review of the evidence on parachute usage, and conclude that in the absence of any randomised trials, we should be wary of concluding that parachutes save lives.

11 This checklist is set out in Social Exclusion Task Force (2008, Appendix 3). In the case of qualitative evidence, see also Mays and Pope (1995) and Spencer et al. (2003).

Conclusion

On most topics, social policymakers cannot hope to thoroughly read all the available studies. The question therefore is not *whether* they should rank them, but *how* such a ranking should be done. This article suggests one possible ranking, which gives systematic reviews precedence over single studies; and ranks methodologies as: randomised trials, natural experiments, before-after studies, and expert opinion.[12]

Naturally, decision-making in the real world does not always allow the luxury of neatly sorting all the available research papers into a hierarchy. In some cases, policymakers must spread their attention across a broad range of issues, or rapidly arrive at a solution. Yet even in such cases, a hierarchy of evidence can be used as a rule of thumb, for example by helping to choose between two studies that arrive at different conclusions. In instances where decisions must be made in the absence of high-quality evidence, the use of a hierarchy may prompt more rigorous evaluation methodologies, laying the groundwork for a better evidence base.

A social policy evidence hierarchy is not only useful for consumers of research, but also for producers. Although randomised trials are generally acknowledged to be superior to before-after studies, it is the case in Australia (and in many other developed countries) that before-after studies are more common than randomised trials.

There is a natural human tendency in all of us to prefer empirical studies whose results accord with our prior beliefs. Using an evidence hierarchy can help avoid such selective use of research, and simplify the task of classifying large bodies of literature. Ultimately, this should help ensure that 'evidence-based policy' means identifying the best evidence where it is available, and using the most rigorous evaluation tools to improve the quality of the evidence base in the long-run.

12 One objection that might be made to this article is that it merely constitutes expert opinion, the lowest grade of evidence in the US Government's Evidence Hierarchy for Medical Research. Unfortunately, there are some practical difficulties standing in the way of a randomised trial of approaches to evidence (in which some policymakers agree to only rely upon randomised trials, others to rely only on natural experiments, and others to rely only on before-after studies).

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Appendix: A ranking of journals by Kalaitzidakis, Mamuneas, and Stengos (2003)

Rank	Journal
1	American Economic Review
2	Econometrica
3	Journal of Political Economy
4	Journal of Economic Theory
5	Quarterly Journal of Economics
6	Journal of Econometrics
7	Econometric Theory
8	Review of Economic Studies
9	Journal of Business and Economic Statistics
10	Journal of Monetary Economics
11	Games and Economic Behavior
12	Journal of Economic Perspectives
13	Review of Economics and Statistics
14	European Economic Review
15	International Economic Review
16	Economic Theory
17	Journal of Human Resources
18	Economic Journal
19	Journal of Public Economics
20	Journal of Economic Literature
21	Economics Letters
22	Journal of Applied Econometrics
23	Journal of Economic Dynamics and Control
24	Journal of Labor Economics
25	Journal of Environmental Economics
26	Rand Journal of Economics
27	Scandinavian Journal of Economics
28	Journal of Financial Economics
29	Oxford Bulletin of Economics and Statistics
30	Journal of International Economics
31	Journal of Mathematical Economics
32	Journal of Economic Behavior and Organization
33	Social Choice and Welfare
34	American Journal of Agricultural
35	International Journal of Game Theory
36	Economic Inquiry
37	World Bank Economic Review
38	Journal of Risk and Uncertainty
39	Journal of Development Economics
40	Land Economics

Rank	Journal
41	International Monetary Fund Staff Papers
42	Canadian Journal of Economics—Revue Canadienne d'Economique
43	Public Choice
44	Theory and Decision
45	Economica
46	Journal of Urban Economics
47	International Journal of Industrial Organization
48	Journal of Law Economics and Organization
49	Journal of Law and Economics
50	National Tax Journal
51	Journal of Industrial Economics
52	Journal of Economic History
53	Oxford Economic Papers
54	Journal of Comparative Economics
55	World Development
56	Southern Economic Journal
57	Explorations In Economic History
58	Economic Record
59	Journal of Banking and Finance
60	Contemporary Economic Policy
61	Journal of Population Economics
62	Journal of Financial and Quantitative Analysis
63	Journal of Institutional and Theoretical Economics
64	Applied Economics
65	Scottish Journal of Political Economy
66	Journal of Economics-Zeitschrift fur Volkwirtshaft und Socialpolitik
67	Journal of Macroeconomics
68	Review of Income and Wealth
69	Oxford Review of Economic Policy
70	Europe-Asia Studies
71	Journal of Health Economics
72	Regional Science and Urban Economics
73	Journal of Economics and Management Strategy
74	World Economy
75	Small Business Economics
76	Economic History Review
77	Cambridge Journal of Economics
78	World Bank Research Observer
79	Energy Journal
80	Weltwirtschaftliches Archiv
81	Kyklos
82	Australian Economic History Review

Rank	Journal
83	Ecological Economics
84	Review of Industrial Organization
85	Geneva Papers On Risk and Insurance
86	Journal of Transport Economics and Policy
87	Economics and Philosophy
88	Journal of Accounting and Economics
89	Resource and Energy Economics
90	Journal of the Japanese and International Economies
91	Journal of Agricultural and Resource Economics
92	Brookings Papers On Economic Activity
93	Economic Development and Cultural Change
94	Communist Economies and Economic Transformation
95	Journal of Regulatory Economics
96	Journal of Housing Economics
97	Manchester School
98	Economic Modelling
99	Journal of Policy Modeling
100	Developing Economies
101	Journal of Productivity Analysis
102	Canadian Journal of Agricultural Economics
103	Australian Journal of Agricultural and Resource Economics
104	Journal of Risk and Insurance
105	Japan and The World Economy
106	Review of Black Political Economy
107	Journal of Economic Psychology
108	Journal of Economic Issues
109	Economics of Education Review
110	Open Economies Review
111	Journal of Agricultural Economics
112	Journal of Economic Education
113	Journal of Post Keynesian Economics
114	Journal of Real Estate Finance and Economics
115	European Review of Agricultural Economics
116	Jahrbucher Fur Nationalokonomie
117	Journal of Evolutionary Economics
118	History of Political Economy
119	Food Policy
120	Real Estate Economics
121	Health Economics
122	Post-Soviet Affairs
123	China Economic Review
124	Insurance Mathematics and Economics

Rank	Journal
125	Review of Social Economy
126	Defence and Peace Economics
127	Bulletin of Indonesian Economic Studies
128	Revue Economique
129	Post-Soviet Geography and Economics
130	International Review of Law and Economics
131	Work Employment and Society
132	Economic Geography
133	Economics of Planning
134	Eastern European Economics
135	Journal of World Trade
136	Futures
137	Applied Economics Letters
138	Energy Economics
139	Journal of Developing Areas
140	Agricultural and Resource Economics Review
141	Hitotsubashi Journal of Economics
142	American Journal of Economics and Sociology
143	New England Economic Review
144	Economy and Society
145	Revue d'Etudes Comparatives Est-Ouest
146	Politicka Ekonomie
147	Japanese Economy
148	Betriebswirtschaftliche Forschung
149	Desarrollo Economico
150	Economic and Social Review
151	Economic Development Quarterly
152	Ekonomicky Casopis
153	Journal of Media Economics
154	Journal of Taxation
155	Nationalokonomisk Tidsskrift
156	Problems of Economic Transition
157	South African Journal of Economics
158	Tijdschrift Voor Economische en Management
159	Trimestre Economico