



Research Brief,

Short Paper

Vol. 3 , No. 9

(2021, June 3)

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An Empirical Analysis of Research Outputs in Community Economic Development: Implications for the Study Area

ISSN 2687-8844

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Abstract

This paper addresses the question, “what are the emerging areas of research in community economic development (CED)”. Using dispersion-analysis of journal publications in the field, the difficulty of repeat-publications in CED is explored. Next, using natural-language processing algorithms, key concepts in CED are “mapped” to identify research opportunities. The results of this research should be of interest to CED stakeholders wanting to advance or promote research in the study area.

Introduction

This paper applies the building blocks of business strategy - tools to assess a firm’s competitive advantage – to the study of CED. Specifically, we provide estimates of growth in different sub-fields of CED (for example, housing) to help researchers position their research.

We proceed as follows. First, we do a Lotka analysis of journal publications in CED in order to recognize the research environment. The question of interest is whether there is a discernible pattern in journal publications in the study area (Armstrong, 2002). For example, based on the idea that only few superstars exist in most disciplines, we examine the frequency of authors publishing 1, 2, 3, and more papers in CED. Next, we react to this environment by developing indicators of areas of research in the field; analysis is limited to papers published in the eight journals listed in Table 1. The thinking is that by assessing the evolution of

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concepts in CED, “gaps” in research can be identified which could be targeted for study.

Our work is applicable for all segments of specialists in CED. In these days of smartphone apps, one can view our work as an operant or machinery that can describe the existing state of research in the field.

Conceptual Framework

Law Based on Facts

Our conception about publishing patterns is based upon the ‘skewness’ that exists in the distribution of output in human activity; for example, there are only a few hundred soloists on any given musical instrument in the very large classical-music marketplace. Similarly, there are only a handful of Noble prize recipients in physics and chemistry. Observations such as these led Lotka (1926) to frame a law to explain relative productivity among scientists; using a scatter plot of frequency of persons having made 1, 2, 3, ... scholarly contributions and their total number of contributions, Lotka observed that the points are closely scattered around a straight line having a slope of approximately negative two. He summarized his empirical observation by the expression:

$$a_n = \frac{a_1}{n^2}, n=1, 2, 3, \dots,$$

where, a_n = number of authors publishing “n” papers, and
 a_1 = number of authors publishing one paper.

In general, the number of persons making 2 contributions is about one-fourth of those making one; number making 3 contributions

is about one-ninth, and number making n contributions is about $1 / n^2$.

Superstardom exists in academic publishing because search for advances or knowledge development in a study area is costly; one needs to discuss with knowledgeable individuals about literature to peruse. This search cost can be minimized if one only looks at the publications of “known” authors. The mechanism underlying this process can be explained as follows.

Assume that authors of journal papers are equally likely to become stars, and each reader chooses one paper at random on a certain topic, published during a certain time period. Further, assume that readers revise their prior after each consultation on the topic. If there were a slight majority of readers that select an author as their choice, that artist would snowball into a star because after each consultation the majority would increase. Put simply, if at any time an author had readership marginally larger than everybody else, this share would increase steadily and propel the author to stardom. The visibility concept in persuasive communications adds face validity to the above explanation (Athiyaman & Merrett, 2010).

Building Blocks of Knowledge in CED

Knowledge about a concept such as ‘quality of life’ can either be declarative (knowing ‘what’) or procedural (knowing ‘how’) (Athiyaman & Go, 2013). Since procedural knowledge needs to be built on declarative knowledge, it is essential that we identify causal statements of the form, ‘if the situation is x, then y will happen’ (Rossitter, 2003).

The extant literature on theory building (for example, Hunt, 1991) suggests that causal relationships are “empirically validated” structural frameworks; we can think of structural frameworks in terms of cross-

tabulating two concepts to gain insights into their relationships, for example, crossclassifying Illinois Counties' quality of life (QOL) metrics (for example, low and high QOL) with their geography (metro and nonmetro) could reveal dependence of QOL on county location, metro or nonmetro.

An example of a structural framework in CED is the Industry Cluster Matrix (Athiyaman, 2021a); principles are conditional and normative statements of the form, if the situation is x then do y. They are "action recipes" (Winograd, 1972). An example of a CED principle is the conditional statement: rise in wages above the "natural" wage stimulates a population increase (cf. the Ricardian system for economic development; Salvadori, 2021).

Methodology

Data for the study were sourced from eight journals that publish research related to CED. Authorship for all research articles were compiled for each journal from the year 2000 through as at June 3, 2021.

To calibrate Lotka's theoretical distribution, we made use of the equality:

$$\sum_{i=1}^{\infty} a_i = a_1 \sum_{i=1}^{\infty} \frac{1}{i^2}$$

However, since

$$\sum_{i=1}^{\infty} \frac{1}{i^2} = \frac{\pi^2}{6}, \text{ the proportion of all contributors}$$

publishing n papers would be:

$$a_n / \sum_{i=1}^{\infty} \frac{1}{i^2} = \frac{6}{\pi^2} \frac{1}{n^2}$$

To identify CED principles, we used object-oriented programming (OOP) to automatically extract concepts from publications listed in Table 1. Concepts were culled by analyzing all distinct words used in the publications. To explore emerging research areas, we constructed a lexical dispersion plot of concepts over time.

Results

Table 1 shows proportion of authors by number of publications. Some of the salient findings include: (i) most authors publish only one paper, (ii) repeated publications is difficult, (iii) journals with higher citations (Regional Studies) have higher percentages of authors with more than one publication – evidence for the existence of superstar phenomenon in the study area; and (iv) Lotka's law describes the overall frequency of publications in the journals (Table 2).

Table 1: Authors by Number of Publications, 2000 to June 3, 2021

Journal	Number of Papers	Number of Authors	Frequency of Publication						
			1	2	3	4	5	6	7 or more
Urban Studies	3426	4395	3059 (70%)	631 (14%)	269 (6%)	136 (3%)	79 (2%)	57 (1%)	164 (4%)
Regional Studies	2196	3519	2792 (79%)	457 (13%)	144 (4%)	58 (2%)	22 (1%)	24 (1%)	22 (1%)
Regional Science and Urban Economics	1237	1829	1409 (77%)	248 (14%)	87 (5%)	46 (3%)	19 (1%)	8 (0%)	12 (1%)
Annals of Regional science	1103	1724	1407 (82%)	200 (12%)	72 (4%)	26 (2%)	10 (1%)	1 (0%)	8 (0%)
Journal of Regional Science	761	1282	1055 (82%)	149 (12%)	54 (4%)	15 (1%)	3 (0%)	2 (0%)	2 (0%)
Community Development Journal	710	1094	1000 (91%)	59 (5%)	18 (2%)	7 (1%)	4 (0%)	4 (0%)	2 (0%)
Economic Development Quarterly	543	848	699 (82%)	94 (11%)	31 (4%)	14 (2%)	5 (1%)	2 (0%)	3 (0%)
Journal of community Practice	522	1061	930 (88%)	87 (8%)	24 (2%)	7 (1%)	5 (0%)	2 (0%)	6 (1%)
Total	10435	13867	10450 (75%)	1846 (13%)	691 (5%)	325 (2%)	184 (1%)	106 (1%)	265 (2%)
Expected(%) (Lotka's law)			61%	15%	7%	4%	2%	2%	9%

Note: The hypothesis that the proportions of observed frequency of publications would differ from the expected proportion is not supported by χ^2 test (critical value of χ^2 , for $1-\alpha = 0.99$ and $df 6 = 16.812$; observed $\chi^2 = 0.11$).

Table 2: Parameter Estimates, Lotka's Law

Journal	Author Concentration			Rank
	$\log[a(n)/a(1)] = \beta \cdot \log(n) + e$			
	beta	(t-value)	R ²	
Urban Studies	-2.2425	(-214.728)	0.990	1
Regional Studies	-2.7843	(-41.801)	0.997	4
Regional Science and Urban Economics	-2.6784	(-35.868)	0.996	3
Annals of Regional science	-3.3051	(-13.551)	0.973	6
Journal of Regional Science	-3.3141	(-22.002)	0.990	7
Community Development Journal	-3.4042	(-28.044)	0.994	9
Economic Development Quarterly	-3.0478	(-36.837)	0.996	5
Journal of community Practice	-3.3851	(-74.058)	0.999	8
All journals	-2.5212	(-178.219)	0.999	2

Given the difficulty of repeat publication in CED journals (Table 1), it is essential that we target emerging areas of research that would be of interest to stakeholders, for example, students and journal editors (Brock et al 2012). The need for such an analysis stems from the

existence of at least three inhibitors of 'quality' research: familiarity trap - favoring the familiar topic instead of focusing on new emerging areas; mature trap – focusing on mature topics or areas of research, and propinquity trap – searching for solutions to

research problems near existing solutions (Varadarajan, 2010).

Areas of Research

Figure 1 shows the top 50 concepts culled from the eight journals, see Table 1.

Concepts such as inequality, business, and performance are seldom discussed. In contrast, housing, and policy concepts are frequently mentioned or discussed.

Figure 1: Term Frequency, Concepts in CED

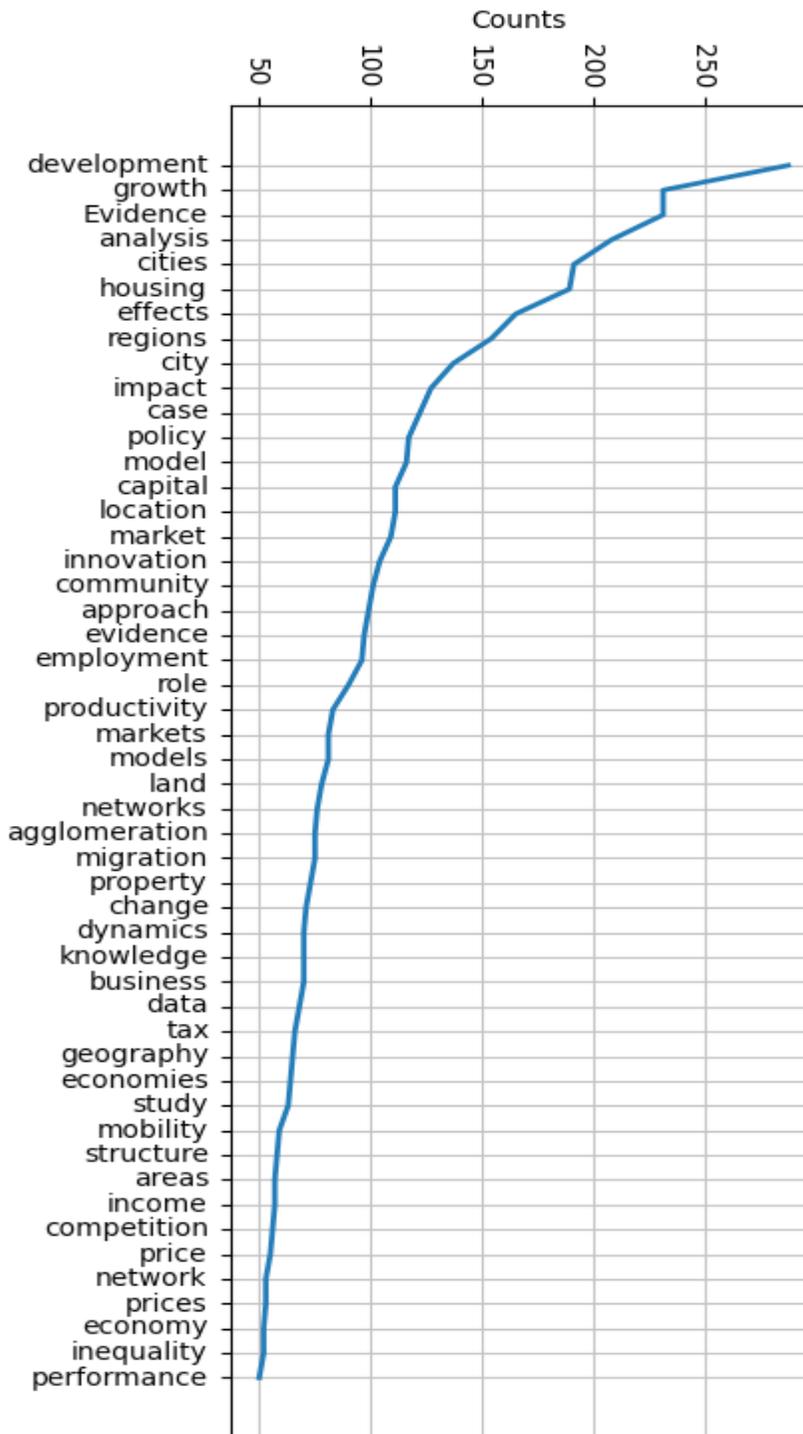


Figure 2 identifies emergent areas of research using a dispersion plot; each “stripe” represents an instance of a concept. Inequality is emerging as a concept. So are business and

performance. Concepts such as “competition” and “innovation” also lack prominence in the study area. In contrast, concepts such as “housing” have received widespread attention.

Figure 2: Dispersion Plot: Concepts in CED



How do we use Figures 1 and 2 to think about researching CED? It depends on the personality of the researcher, whether she is of the “sensing-thinking” type or the “sensing-feeling” type, for example, cf. the Jungian typology (Cambray and Sawin, 2018).

The Jungian typology classifies psychological functions into four categories;

two for perceptual functions and two for evaluative modes. The two modes of perception are sensation and intuition; thinking and feeling are the first-order factors for evaluation. Assumption of orthogonality between ‘perception’ and ‘evaluation’ leads to a 2x2 grid of perception-evaluation crosstabulation (Figure 3).

Figure 3: Psychological Types

		Perception	
		Sensation	Intuition
Evaluation	Thinking		
	Feeling		

A preference for sensation suggests data driven, attention to detail, hard-facts person. In contrast, an intuitive person perceives the whole stimulus, as a gestalt. For evaluation, a thinking person uses logical analysis and reasoning, relies on cognitive processes. A preference for feeling indicates reliance on affective processes, she is more concerned with moral judgments (good, bad, etc.).

In general, sensation-thinking types are model bound; they tend to rely on symbolic representations of research problems. In contrast, intuition-feeling types conceptualize problems as stories that have a strong moral component.

For a given problem situation such as health or wage inequality among the population, the personality of the researcher would dictate the inquiry system (Wenger, McDermott, and Snyder, 2002). The Lockean, Leibnizian, and the Kantian inquiry systems are suitable for the “modelers”, whereas the Hegelian inquiry system is applicable for the gestalt perceiver and the emotional assessor of problems.

The Lockean approach is inductive, from raw data a more general set of facts are constructed; experts must agree on the nature of the problem, for example, that health inequality is prevalent among the minority population. The Delphi method (Masser and Foley, 1987) is an example of the Lockean approach. In contrast to the Lockean, the Leibnizian approach is deductive in nature; starting from a set of primitive axioms, for example, that spending on healthcare decreases with increases in family size, first and second order propositions are constructed, empirically tested, and results

communicated to relevant stakeholders (Athiyaman, 2021b).

The third type of inquiring system is the multi model, synthetic, Kantian system. On any problem, Kantians will build at least two alternate representations of it, both built on theory. The models are calibrated or empirically analyzed and the best model chosen as the solution to the problem. Finally, the Hegelian inquiry system offers two competing explanations of a problem and is well suited for ill-structured or vague problems; a forte for intuitive-feeling types.

Summary and Conclusion

Publishing in CED journals is difficult; only a handful of scientists repeat publish. One way to react to this “superstar” publishing environment is to focus on emerging areas of research such as inequality, business competition and performance.

Scientific enquiry begins with a problem, deviation of reality from expectations; reality is data. The “messy data” has to be given a structure or an organizing framework. This is the conceptual model; we use an inquiry system such as the Lockean or the Hegelean to guide our thinking to organize the data; reality is not projected on an empty mind.

More than five decades ago Webb (1961) reminded us to be mindful of “conformity” in research; scientists should not succumb to the charm of social benefits of working in an over-researched topic area at the expense of the scientific implications of such work. Also, one can hardly be creative if one is avidly listening to the voice of others. This paper shows how to avoid this propinquity bias.

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