

[Home](#) > [Health Care Management Science](#) > Article

Managed care, deficit financing, and aggregate health care expenditure in the United States: A cointegration analysis

Published: September 2000

Volume 3, pages 279–285, (2000) [Cite this article](#)[Save article](#)[View saved research >](#)

[Health Care Management Science](#)

[Aims and scope →](#)[Submit manuscript →](#)

N.R. Vasudeva Murthy¹ & Albert A. Okunade²

358 Accesses 60 Citations 3 Altmetric [Explore all metrics →](#)

Abstract

We applied a battery of cointegration tests comprising those of Johansen and Juselius [19], Phillips and Hansen [35], and Engle and Granger [6], to model aggregate health care expenditure using 1960–96 US data. The existence of a stable long-run economic relationship or cointegration is confirmed, in the United States, between aggregate health care expenditure and real GDP, population age distribution, managed care enrollment, number of practicing physicians, and government deficits. The evidence of cointegration among these variables, chosen on the theoretical basis of prior studies, implies that while they are individually non-stationary in levels, together they are highly correlated and move, in the long

run to form an economic equilibrium relationship of US aggregate health care expenditure. More specifically, and for the first time in this line of inquiry, (i) managed care enrollment is found to be negatively associated with the level of health care spending, (ii) supply disinduced demand effects of physicians tend to moderate health expenditure, and (iii) government deficit financing is positively related to health care spending. The observed sign and magnitude of the income coefficient are consistent with health care being a luxury good.

 This is a preview of subscription content, [log in via an institution](#)  to check access.

Access this article

[Log in via an institution](#) 

Subscribe and save

 Springer+

from €37.37 /Month

- Starting from 10 chapters or articles per month
- Access and download chapters and articles from more than 300k books and 2,500 journals
- Cancel anytime

[View plans](#) 

Buy Now

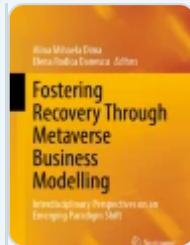
[Buy article PDF 39,95 €](#)

Price includes VAT (Poland)

Instant access to the full article PDF.

[Institutional subscriptions](#) 

Similar content being viewed by others



[The relationship between healthcare expenditure and disposable personal income in the US states: a fractional...](#)

Article | 08 July 2017

[Affordable Care Act, Public Legislation, and Professional Self-Regulation: Implications for Public Policy](#)

Chapter | © 2017

[A Dynamic Heterogeneous Panel Model for Predicting Healthcare Expenditure in the Middle East Countries](#)

Chapter | © 2023

Explore related subjects

Discover the latest articles, books and news in related subjects, suggested using machine learning.

[Econometrics](#)

[General Economical Equilibrium](#)

[Health Economics](#)

[Microeconomics](#)

[Pharmacoconomics](#)

[Public Economics](#)

References

- [1] G.F. Anderson and J.-P. Poullier, Health spending, access and outcomes: Trends in Industrialized countries, *Health Affairs* (1999) 178–192.
- [2] D.M. Cutler, The cost and financing of health care, *American Economic Review* (1995) 33–34.
- [3] S.L. Decker and K. Hempstead, HMO penetration and quality of care: The case of breast cancer, *Journal of Health Care Finance* 26(1) (1999) 18–32.
- [4] D.N. DeJong, J.C. Nankervis, N.E. Saving and C.H. Whiteman, Integration

[Google Scholar](#)

versus trend stationarity in macroeconomic time series, *Econometrica* 60 (1992) 423-431.

[Article](#) [Google Scholar](#)

[5] F.X. Diebold and G.D. Rudebusch, On the power of Dickey-Fuller tests against fractional alternatives, *Economics Letters* 35 (1991) 155-160.

[Article](#) [Google Scholar](#)

[6] R.F. Engle and C.W.J. Granger, Co-integration and error-correction: Representation, estimation and testing, *Econometrica* (1987) 251-276.

[7] B.J. Fox, L.L. Taylor and M.K. Yücel, America's health care problem: An economic perspective, *Federal Reserve Bank of Dallas Economic Review*, III Qtr. (1993) 21-31.

[Google Scholar](#)

[8] W.A. Fuller, *Introduction to Statistical Inference* (Wiley, New York, 1996).

[Google Scholar](#)

[9] U.G. Gerdtham, J. Søgaard, F. Andersson and B. Jünsson, An econometric analysis of health care expenditure: A cross-section study of the OECD countries, *Journal of Health Economics* (1992) 63-84.

[10] U.G. Gerdtham, J. Søgaard, F. Andersson and B. Jünsson, A pooled cross section analysis of the health care expenditures of the OECD countries, in: *Health Economics Worldwide*, eds. P. Zweifel and H. Frech (Kluwer, Dordrecht, The Netherlands, 1990).

[Google Scholar](#)

[11] T.E. Getzen, Macroeconomics and health care spending: The policy implications of delayed response, in: *Readings in Public Policy*, ed. J.M. Pgodzinski (Blackwell Business, 1995).

[12] J. Gonzalo and T.-H. Lee, Pitfalls in testing for long-run relationships, *Journal of Econometrics* 86(1) (1998) 129–154.

[Article](#) [Google Scholar](#)

[13] H. Hansen and K. Juselius, *CATS in RATS - Cointegration Analysis Time Series* (Estima, IL, 1995).

[14] P. Hansen and A. King, Health care expenditure and GDP: Panel data unit root test results - comment, *Journal of Health Economics* 17 (1998) 377–381.

[Article](#) [Google Scholar](#)

[15] P. Hansen and A. King, The determinates of health care expenditure: A cointegration approach, *Journal of Health Economics* 15 (1996) 127–137.

[Article](#) [Google Scholar](#)

[16] C. Hargreaves, A review of methods of estimating cointegrating relationships, in: *Nonstationary Time Series Analysis and Cointegration*, ed. C. Hargreaves (Oxford University Press, Oxford, UK, 1992).

[Google Scholar](#)

[17] J. Henderson, *Health Economics and Policy* (Southwestern Publishing, Cincinnati, 1999).

[Google Scholar](#)

[18] T. Hitiris and J. Posnett, The determinants and effects of health expenditure

[19] S. Johansen and K. Juselius, Maximum likelihood estimation and inference on cointegration - with applications to the demand for money, *Oxford Bulletin of Economics and Statistics* (1990) 169-210.

[20] B. Jönsson and U.-G. Gerdtham, Health care systems internationally, in: *Handbook of Health Economics*, Vol. 1A, eds. A.J. Culyer and J.P. Newhouse (North-Holland, 2000) pp. 11-53.

[21] G. Karatzas, On the effect of income and relative price on the demand for health care - the EEC evidence: A comment, *Applied Economics* (1992) 1251-1253.

[22] A. King and P. Hansen, Aggregate health care expenditure in the United States: Evidence from cointegration tests: A comment, *Applied Economics Letters* 3 (1996) 37-39.

[Google Scholar](#)

[23] D. Kwiatkowski, P.C.B. Phillips, P. Schmidt and Y. Shin, Testing the null hypothesis of stationarity against the alternative of a unit root, *Journal of Econometrics* 1 (1992) 159-178.

[Article](#) [Google Scholar](#)

[24] R.E. Leu, The public-private mix and international health care costs, in: *Public and Private Health Services*, eds. A.J. Culyer and B. Jonsson (Basil Blackwell, Oxford 1986).

[Google Scholar](#)

[25] K.R. Levit et al., National health spending trends, 1960-1993, *Health Affairs*

[26] W.G. Manning et al., Health insurance and the demand for medical care, *American Economic Review* (1987) 251-277.

[27] S.K. McCoskey and T.M. Selden, Health care expenditures and GDP: Panel data unit root test results, *Journal of Health Economics* 17 (1998) 369-376.

[Article](#) [Google Scholar](#)

[28] N.R.V. Murthy and V. Ukpolo, Aggregate health care expenditure in the United States: New results, *Applied Economics Letters* 2 (1995) 419-421.

[Article](#) [Google Scholar](#)

[29] J.P. Newhouse, Medical care expenditure: A cross-national survey, *Journal of Human Resources* 12 (1977) 115-125.

[Article](#) [Google Scholar](#)

[30] J.P. Newhouse, Cross-national differences in health spending: What do they mean?, *Journal of Health Economics* 6 (1987) 159-162.

[Article](#) [Google Scholar](#)

[31] A. Okunade and C. Suraratdecha, Health expenditure inertia in the OECD countries: A heterogeneous analysis, *Health Care Management Science* 3(1) (2000) 31-42.

[Article](#) [Google Scholar](#)

[32] Organization for Economic Co-operation and Development, *Health Care Systems in Transition: The Search for Efficiency* (Paris, 1990).

[33] Organization for Economic Cooperation and Development, *OECD Health Data 98* (Washington, 1998).

[34] M.H. Pesaran and B. Pesaran, *MICROFIT 4.0* (Oxford University Press, Oxford, 1997).

[Google Scholar](#)

[35] P.C.B. Phillips and B.E. Hansen, Statistical inference in instrumental variables regression I(1) process, *Review of Economic Studies* (1990) 99-125.

[36] P. Phillips and P. Perron, Testing for a unit root in time series regression, *Biometrika* (1988) 335-346.

[37] S. Smith, M. Freeland, S. Heffler and D. McKusick, The Health Expenditures Projection Team, 1998. The next ten years of health spending: What does the future hold?, *Health Affairs* 17 (1998) 128-140.

[Article](#) [Google Scholar](#)

[38] US Government Printing Office, *Economic Report of the President, 1998* (Washington, DC, 1998).

[39] US Bureau of the Census, *Statistical Abstract of the United States* (various years).

Author information

Authors and Affiliations

Department of Economics and Finance, College of Business Administration, Creighton University, 2500 California Plaza, Omaha, NE, 68178, USA

N.R. Vasudeva Murthy

Department of Economics, The University of Memphis, Campus Box 526450, Memphis, TN, 38152, USA

Albert A. Okunade

Rights and permissions

[Reprints and permissions](#)

About this article

Cite this article

Murthy, N.V., Okunade, A.A. Managed care, deficit financing, and aggregate health care expenditure in the United States: A cointegration analysis. *Health Care Management Science* **3**, 279–285 (2000).

<https://doi.org/10.1023/A:1019066012984>

Issue date

September 2000

DOI

<https://doi.org/10.1023/A:1019066012984>

[health expenditure](#)

[cointegration](#)

[managed care](#)

[physician induced demand](#)

[deficit financing](#)

Search

Search by keyword or author



Navigation

[Find a journal](#)

[Publish with us](#)

[Track your research](#)