

**INFRAESTRUCTURAS, EXTERNALIDADES
Y CRECIMIENTO REGIONAL:
ALGUNAS APORTACIONES PARA EL CASO ESPAÑOL**

Rosina Moreno Serrano

Tesis dirigida por el Dr. Manuel
Artís Ortuño en el marco
del programa de doctorado
“Economía i Territori” de la
Universidad de Barcelona.

Departamento de Econometría,
Estadística y Economía Española.

Barcelona, Septiembre de 1998.

B.U.B. Secció d'Econòmiques
Diagonal, 690, 08034 Barcelona
Tel. 402 19 66

REFERENCIAS BIBLIOGRÁFICAS

- Aaron, H.J. (1990) "Discussion of Why is infrastructure important?", en Munnell, A.H. "Is there a shortfall in public capital investment?", *Conference series n.34, Federal Reserve Bank of Boston*, 51-63.
- Abramovitz, M. (1986) "Catching-up, forging ahead and falling behind", *Journal of Economic History*, 46(2), 385-406.
- Ades, A. y Chua, H.B. (1997) "The neighbor's curse: regional instability and economic growth", *Journal of Economic Growth*, 2, 279-304.
- Aghion, P. y Howitt, P. (1992) "A model of growth through creative destruction", *Econometrica*, 60, 323-351.
- Aguado, M.J. y Jiménez, M. (1992) "La inversión pública en infraestructura y el programa de convergencia", *Cuadernos de Actualidad, Hacienda Pública Española*, 5, año III.
- Albi, E., Contreras, C., González-Páramo, J.M y Zubiri, I. (1992) *Teoría de la Hacienda Pública*, Ariel Economía (Eds.), Madrid.
- Alegre, J. (1992) *Las relaciones de sustitución entre inputs energéticos en las industrias españolas, 1978-1986*, Tesis Doctoral de la Universidad de Barcelona. Junio, 1992.
- Amable, B. y Guellec, D. (1992) "Les théories de la croissance endogène", *Revue d'Economie Politique*, 102(3), 313-377.
- Amemiya, T. (1971) "The estimation of the variances in a variance-components model", *International Economic Review*, 12, 1-13.
- Andrews, K. y Swanson, J. (1995) "Does public infrastructure affect regional performance?", *Growth and Change*, 26, 204-216.
- Anselin, L. (1980) "Estimation methods for spatial autoregressive structures", *Regional Science Dissertation and Monograph Series*, 8, Cornell University, Ithaca, NY.
- Anselin, L. (1981) "Small sample properties of estimators for the linear model with a spatial autoregressive structure in the disturbance", *Modelling and Simulation*, 12, 899-904.
- Anselin, L. (1986) "Non-nested tests on the weight structure in spatial autoregressive models: some Monte Carlo results", *Journal of Regional Science*, 26(2), 267-284.
- Anselin, L. (1988a) *Spatial Econometrics: Methods and Models*. Kluwer Academic Publishers, The Netherlands.
- Anselin, L. (1988b) "Lagrange multiplier test diagnostic for spatial dependence and spatial heterogeneity", *Geographical Analysis*, 20(1), 1-17.
- Anselin, L. (Ed.) (1992a) "Space and applied econometrics", Special Issue, *Regional Science and Urban Economics*, 22.
- Anselin, L. (1992b) "SpaceStat: A program for the analysis of spatial data", *National Center for Geographic Information and Analysis*, University of California, Santa Barbara, CA.

Anselin, L. (1990) "Spatial dependence and spatial structural instability in applied regression analysis", *Journal of Regional Science*, 30(2), 185-207.

Anselin, L. (1995) "Local indicators of spatial association-LISA", *Geographical Analysis*, 27, 93-115.

Anselin, L. (1998) "Rao's score test in spatial econometrics", *Working Paper 9801, Regional Research Institute*, Morgantown, WV.

Anselin, L. y Griffith, D.A. (1988) "Do spatial effects really matter in regression analysis?", *Papers Regional Science Association*, 65, 11-34.

Anselin, L. y Hudak, S. (1992) "Spatial econometrics in practice. A review of software options" *Regional Science and Urban Economics*, 22(3), 509-536.

Anselin, L. y Florax, R. (Eds.) (1995a) *New directions in spatial econometrics*, Springer-Verlag, Berlin.

Anselin, L. y Florax, R. (1995b) "Small sample properties of tests for spatial dependence in regression models: some further results", en L. Anselin y R. Florax (Eds.), *New Directions in Spatial Econometrics*, Springer-Verlag, Berlin, 21-74.

Anselin, L., Bera, A., Florax, R. y Yoon, M. (1996) "Simple diagnostic tests for spatial independence" *Regional Science and Urban Economics*, 27, 77-104.

Anselin, L. y Rey, S (Eds.) (1997) "Spatial Econometrics", Special Issue, *International Regional Science Review*, 20.

Anselin, L., Varga, A. y Acs, Z. (1997) "Local geographic spillovers between university research and high technology innovations", *Journal of Urban Economics*, 42(3), 422-448.

Anselin, L. y Moreno, R. (1998) "Specification tests for spatial error components", *Mimeo*.

Appelbaum, E. (1978) "Testing neoclassical production theory", *Journal of Econometrics*, 7, 87-102.

Arcarons, J., Parellada, M. y Soy, A. (1992) "El arco mediterráneo del desarrollo económico español, delimitaciones y relaciones interiores", en J. Velarde, J.L. García Delgado y A. Pedreño (Eds), *Ejes territoriales de desarrollo: España en la Europa de los 90*, Madrid, Economistas Libros.

Argimón, I. y Martín, M.J. (1993) "Series de stock de infraestructuras del Estado y de las Administraciones Públicas en España", *Banco de España. Servicio de estudios*, DT-9315.

Argimón, I., González-Paramo, J.M., Martín, M.J. y Roldán, J.M. (1993) "Productividad e infraestructuras en la economía española", *Banco de España. Servicio de estudios*, DT-9313.

Argimón, I., González-Paramo, J.M., Martín, M.J. y Roldán, J.M. (1994a) "Productividad e infraestructuras en la economía española", *Moneda y Crédito*, 198, 207-240.

Argimón, I., González-Paramo, J.M., Martín, M.J. y Roldán, J.M. (1994b) "Inversión privada, gasto público y efecto expulsión: Evidencia para el caso español", *Banco de España. Servicios de Estudios*, DT-9424.

- Armstrong, H.W. (1995) "Crisis or opportunity? Regional policy and structural aid, The European Union and the 1996 IGC", *Discussion paper del Grupo de Expertos Jean Monnet, Centro de Estudios de la Unión Europea*, University of Hull, UK.
- Arnott, R.J. y McKinnon, J. (1977) "The effects of urban transportation changes: A general equilibrium simulation", *Journal of Public Economics*, 8, 19-36.
- Arora, S. y Brown, M. (1977) "Alternative approaches to spatial autocorrelation: An improvement over current practice", *International Regional Science Review*, 2, 67-78.
- Arrow, K.J. (1962) "The economic implications of learning by doing", *Review of Economic Studies*, 29, 155-173.
- Aschauer, D.A. (1989a) "Is public expenditure productive?", *Journal of Monetary Economics*, 23, Marzo, 177-200.
- Aschauer, D.A. (1989b) "Public investment and productivity growth in the Group of Seven Federal Reserve Bank of Chicago", *Economic Perspectives*, 13, 17-25.
- Aschauer, D.A. (1989c) "Does public capital crowd out private capital?", *Journal of Monetary Economics*, 24(2), 171-188.
- Aschauer, D.A. (1990) "Why is infrastructure important?", en A.H. Munnell, (Ed.), *Is there a shortfall in public capital investment?*, Federal Reserve, Bank of Boston, Boston.
- Audretsch, D. y Zoltan, A. (1988) "Small firm mobility: a first report", *Economics Letters*, 26(3), 281-284.
- Audretsch, D. y Feldman, M. (1993) "The geography of innovation and production", *CEPR Conference*, Vigo (España).
- Avilés, A., Gómez, R. y Sánchez, J. (1997a) "Los efectos de la infraestructura pública sobre los costes, producción y demanda de las ramas de actividad españolas", *Comunicación presentada en el IV Encuentro de Economía Pública*, Pamplona.
- Avilés, A., Gómez, R. y Sánchez, J. (1997b): "La productividad de la infraestructura pública en la producción privada", *Comunicación presentada en el XII Simposio de Análisis Económico*, Barcelona.
- Azariadis, C. y Drazen, A. (1990) "Threshold externalities in economic development", *Quarterly Journal of Economics*, 105(2), 501-526.
- Aznar, A., Mur, J. y Trivez, F. (1996) "Métodos econométricos en el análisis regional", *Comunicación presentada en la XXII Reunión de Estudios Regionales*, Pamplona.
- Baiges, J., Molinas, C. y Sebastián, M. (1987) "La economía española 1964-1985: datos, fuentes y análisis", *Instituto de Estudios Fiscales*. Madrid.
- Bairam, E. y Ward, B. (1993) "The externality effect of government expenditure on investment in OECD countries", *Applied Economics*, 25, 711-716.

- Bajo, O. y Sosvilla, S. (1993) "Does public capital affect private sector performance?. An analysis of the Spanish case, 1964-1988", *UNED DT-9208*.
- Baltagi, B.H. (1995) *Econometric Analysis of Panel Data*, John Wiley & Sons.
- Ballesteros, J.F. (1991) "El gasto público en infraestructuras", *Cuadernos de Actualidad. Hacienda Pública Española*, 9, 249-254.
- Ballesteros, J.F. (1992) "Las inversiones en infraestructuras en el presupuesto para 1993 del MOPT", *Hacienda Pública Española*, 10, 277-286.
- Ballesteros, J.F. (1994) "La inversión pública en infraestructuras en el período 1990-1993", *Hacienda Pública Española*, 5, 177-184.
- Bandrés, E. (1992) "La inversión en infraestructuras", *Economistas*, 50, 24-33.
- Bartels, C.P.A. y Hordijk, L. (1977) "On the power of the generalized Moran contiguity coefficient in testing for spatial autocorrelation among regression disturbances", *Regional Science and Urban Economics*, 7, 83-101.
- Barro, R.J. (1990) "Government spending in a simple model of endogenous growth", *Journal of Political Economy*, 98, (5), parte II, 103-125.
- Barro, R.J. y Sala-i-Martin, X. (1992) "Public finance in models of economic growth", *Review of Economic Studies*, 59, (4), 645-661.
- Barro, R.J. y Sala-i-Martin, X. (1995) *Economic Growth*, McGraw-Hill, New York.
- Bartelsman, E.J., Baballero, R. y Lyons, R.K. (1994) "Customer- and supplier-driven externalities", *American Economic Review*, 84, 1075-1085.
- Batten, D.F. y Karlsson, C. (1996) *Infrastructure and the Complexity of Economic Development*, Springer, Heidelberg.
- Baumol, W.J. (1986) "Productivity growth, convergence and welfare: What the long-run data show", *American Economic Review*, 76(5), 1072-1085.
- BBV (varios años) *Renta Nacional de España y su distribución provincial*.
- Bean, Ch. (1996) "The impact of Cohesion Fund spending on regional output and employment in the presence of interregional spillovers", *Mimeo, London School of Economics*.
- Beattie, B.R. y Taylor, C.R. (1985) *The economics of production*, Wiley.
- Becattini, G. (1979) "Dal settore industriale al distretto industriale. Alcune considerazioni sull'unità di indagine dell'economia industriale", *Rivista di Economia e Politica Industriale*, 1. Traducción al catalán en *Revista Econòmica de Catalunya*, 1, 4-11.
- Beeson, P. y Eberts, R.W. (1987) "Identifying amenity and productivity cities using wage and rent differential", *Economic Review*, Federal Reserve Bank of Cleveland, Quarter 3.

- Begg, I. (1995) "Factor mobility and regional disparities in the European Union", *Oxford Review of Economic Policy*, 11(2), 96-112.
- Bellandi, M. (1995) "Economie di scala e organizzazioni industriali", *Franco Angeli*, Milano.
- Bera, A.K. y McKenzie, C.R. (1986) "Alternative forms and properties of the Score Test", *Journal of Applied Statistics*, 13, 13-25.
- Bera, A.K. y Yoon, M.J. (1992) "Simple diagnostic tests for spatial dependence", *Champaign, IL: Department of Economics*, University of Illinois.
- Bera, A.K. y Yoon, M.J. (1993) "Specification testing with misspecified alternatives", *Econometric Theory*, 9, 649-658.
- Berglas, E. y Pines, D. (1981) "Clubs, local public goods and transportation models: A synthesis", *Journal of Public Economics*, 15(2), 141-162.
- Berndt, E.R. (1991) "Modeling the interrelated demands for factors of production: Estimation and inference in equation systems", en *The Practice of Econometrics: Classic and Contemporary*, Addison-Wesley Publishing Company, Capítulo 9, 449-506.
- Berndt, E.R. y Hanson, B. (1992) "Measuring the contribution of public infrastructure capital in Sweden", *Scandinavian Journal of Economics*, 94(0), 151-172.
- Bernstein, J.I. (1988) "Costs of production, intraindustry and interindustry R&D spillovers: Canadian evidence", *Canadian Journal of Economics*, 21, 324-347.
- Bernstein, J.I. (1989) "An examination of the equilibrium specification and structure of production for Canadian telecommunications", *Journal of Applied Econometrics*, 4, 265-282.
- Bernstein, J.I. (1996) "International R&D spillovers between industries in Canada and the United States, social rates of return and productivity growth", *Canadian Journal of Economics*, XXIX, 463-467.
- Bernstein, J.I. y Yan, X. (1997) "International R&D spillovers between Canadian and Japanese industries", *Canadian Journal of Economics*, XXX(2), 276-294.
- Bertolà, G. (1992) "Models of economic integration and localized growth", *CEPR Discussion Paper*, 651.
- Biehl, D. (1986) "Infraestructuras y desarrollo regional", *Papeles de Economía Española*, 35, 293-310.
- Biehl, D. *et al.* (1982) The contribution of infrastructure to regional development, *Regional Policy Division*, European Community, Bruselas.
- Black, J. (1969) "Learning by doing and optimum savings", *Canadian Journal of Economics*, 604-612.
- Blommestein, H.J. (1983) "Specification and estimation of spatial econometric models. A discussion of alternative strategies for spatial economic modelling", *Regional Science and Urban Economics*, 13, 251-270.
- Blommestein, H. y Nijkamp, P. (1986) "Testing the spatial scale and the dynamic structure in regional models. A contribution to spatial econometric specification analysis", *Journal of Science*, 26(1), 1-17.

Blum, U. (1982) "Effects of transportation investments on regional growth: a theoretical and empirical investigation" *Papers and Proceedings of the Regional Science Association*, 49, 169-184.

Boarnet, M.G. (1997a) "Infrastructure services and the productivity of public capital: The case of streets and highways", *National Tax Journal*, L(1), 39-57.

Boarnet, M.G. (1997b) "Highways and economic productivity: Interpreting recent evidence", *Journal of Planning Literature*, 11(4), 3476-486.

Boscá, J.E., Dabán, T. y Escribá, J. (1998) "Evaluación económica del capital privado y de las infraestructuras públicas en el sector industrial de las regiones españolas (1980-1993): Un enfoque dual", *Comunicación presentada en el I Encuentro de Economía Aplicada*, Barcelona.

Böventer, E. von (1962) "Die struktur der landschaft Versuch einer synthese und weiterentwicklung der modelle J.H. v.Thünen, W, Christallers und A. Lösch", en *Optimales Wachstum und optimales Standortverteilung*, Berlin.

Braid, R.M. (1989) "The optimal locations of multiple bridges, connecting facilities or product varieties", *Journal of Regional Science*, 29(1), 63-70.

Brandsma, A. y Ketellapper, R. (1979a) "Further evidence on alternative procedures for testing of spatial autocorrelation among regression disturbances", en *Exploratory and Explanatory Analysis in Spatial data*, C.Bartels y R. Ketellapper ed., 111-136.

Brandsma, A. y Ketellapper, R. (1979b) "A biparametric approach to spatial autocorrelation", *Environment and Planning* 11, 51-58.

Breusch, T.S. (1980) "Useful invariance results for generalized regression models", *Journal of Econometrics*, 13, 327-340.

Breusch, T. S. y Pagan, A.R. (1980) "The Lagrange multiplier test and its applications to model specification in econometrics", *Review of Economic Studies*, 47, 239-253.

Brown, R.S y Christensen, L.R. (1981) "Estimating elasticities of substitution on a model of partial static equilibrium: An application to U.S. agriculture, 1947 to 1974", en E.R. Berndt y B.C. Fields (Eds.), *Modeling and Measuring Natural Resource Substitution*, MIT Press, Cambridge, Massachusetts 209-229.

Bruinsma, F.R. (1995) "The impact of new infrastructure on the spatial patterns of economic activities", *Comunicación presentada en el 35th European Regional Science Assotiation Congress*, Agosto, 1995.

Bruinsma, F.R., Rienstra, S.A. y Rietveld, P. (1995) "Economic impacts of a transport corridor: a multi-level and multi-approach case study for the construction of the A1 highway in the Netherlands", *Comunicación presentada en el 35th European Regional Science Assotiation Congress*, Agosto, 1995.

Buiter, W.H. (1977) "Crowding out and the effectiveness of fiscal policy", *Journal of Public Economics*, 7, 309-328.

Burnside, C. (1996) "Production function regression, returns to scale and externalities", *Journal of Monetary Economics*, 37, 177-201.

Burridge, P. (1980) "On the Cliff-Ord tests for spatial autocorrelation", *Journal of the Royal Statistical Society*, 41, 107-108.

Button, K. (1996) "Ownership, investment and pricing of transport and communications", en D.F. Batten y C. Karlsson (Ed.) *Infrastructure and the Complexity of Economic Development*, Springer, Heidelberg, 147-168.

Button, K.J., Leitham, S., McQuaid, R.W. y Nelson, J.D. (1995) "Transport and industrial and commercial location", *Annals of Regional Science*, 29, 189-206.

Caballero, R.J. y Lyons, R.K. (1989) "The role of external economies in U.S. manufacturing", *NBER DT-3033*.

Caballero, R.J. y Lyons, R.K. (1990) "Internal versus external economies in European industry", *European Economic Review*, 34, 805-830.

Caballero, R.J. y Lyons, R.K. (1992) "External effects in US procyclical productivity", *Journal of Monetary Economics*, 29, 209-225.

Caballero, R.J. y Jaffee, A.B. (1993) "How high are the giants' shoulders: An empirical assessment of knowledge spillovers and creative destruction in a model of economic growth", *NBER Macroeconomics Annual*, 8(8), 15-73.

Calabuig, V., de Castro, J., Escriba, J. y Ruiz, R. "Estimación del capital privado regionalizado", *Mimeo, IVIE*.

Calzonetti, F.J. y Walker, R.T. (1991) "Factors affecting industrial location decisions: A survey approach", H.W. Herzog y A.M. Schlottmann (Ed.) *Industry Location and Public Policy*, University of Tennessee Press, Knoxville, 221-240

Can, A. (1992) "Specification and estimation of hedonic housing price models", *Regional Science and Urban Economics*, 22, 453-474.

Case, A.C. (1994) "Taxes and the electoral cycle: How sensitive are governors to coming elections?", *Federal Reserve Bank of Philadelphia Business Review*, 0(2), 17-26.

Case, A.C., Rosen, H.S. y Hines, J.R. (1993) "Budget spillovers and fiscal policy interdependence: Evidence from the states", *Journal of Public Economics*, 52, 285-307.

Casetti, E. (1986) "The dual expansion method: An application for evaluating the effects of population growth on development", *IEEE Transactions on Systems, Man and Cybernetics*, SMC-16, 29-39.

Casetti, E. (1972) "Generating models by the expansion method: Applications to geographical research", *Geographical Analysis*, 4, 81-91.

Casetti, E. (1991) "The investigation of parameter drift by expanded regressions: Generalities and a family planning example", *Environment and Planning A*, 23, 1045-1051.

Casetti, E. y Poon, J. (1995) "Econometric models and spatial parametric instability: relevant concepts and an instability index", *New Directions in Spatial Econometrics*, 301-318. Springer, Berlin.

Christensen, L.R., Jorgenson, D.W. y Lau, L.J. (1971) "Conjugate duality and the transcendental logarithmic production function", *Econometrica*, 39(4).

- Christensen, L.R., Jorgenson, D.W. y Lau, L.J. (1973) "Transcendental logarithmic production frontiers", *Review of Economics and Statistics*, 55(1), 28-45.
- Christensen, L.R., Jorgenson, D.W. y Lau, L.J. (1975) "Transcendental logarithmic utility functions", *American Economic Review*, 65(3), 367-383.
- Ciccone, A. (1997) "Externalities and interdependent growth: Theory and evidence", *University of California at Berkeley and University Pompeu Fabra, Mimeo*.
- Ciccone, A. y Hall, R.E (1996) "Productivity and the density of economic activity", *American Economic Review*, 86(1), 54-70.
- Cliff, A. y Ord, J. (1972) "Testing for spatial autocorrelation among regression residuals", *Geographic Analysis*, 4, 267-284.
- Cliff, A. y Ord, J. (1973) *Spatial Autocorrelation*, London, Pion.
- Cliff, A. y Ord, J. (1981) *Spatial Process. Models and Applications*, London, Pion.
- Coe, D. y Helpman, E. (1995) "International R&D spillovers", *European Economic Review*, 39, 859-887.
- Coe, D.T. y Moghadam, R. (1993) "Capital and trade as engines of growth in France: An application of Johansen's cointegration methodology", *IMF Staff Papers*, 40, 542-666.
- Comín, F. (1985) "Fuentes cuantitativas para el estudio del sector público en España. 1801-1980", *Monografía 40, Instituto de Estudios Fiscales*. Madrid.
- Commission of the European Communities (1994) "Quid-consult indicators", *Working Paper of the Commission's Services*, Bruselas.
- Conrad, K. y Seitz, H. (1992) "The 'public capital hypothesis': The case of Germany", *Recherches Economiques de Louvain*, 58(3-4), 309-327.
- Conrad, K. y Seitz, H. (1994) "The economic benefits of public infrastructure", *Applied Economics*, 26, 303-311.
- Corugedo, I., Dávila, L., Martín, R y Moliner, P. (1995) "Efectos del marco de apoyo comunitario 1989-1993 sobre el crecimiento y la distribución de la renta regional", *FEDEA*, DT- 9413.
- Costa, M.T. y Callejón, M. (1995) "Geografía de la producción", *Seminario Internacional sobre los Impactos de los procesos de globalización económica en los sistemas productivos locales*, Barcelona, Diciembre 1995.
- Costello, D.M. (1993) "A cross-country, cross-industry comparison of productivity growth", *Journal of Political Economy*, 101(2), 207-222.
- Cressie, N. (1993) *Statistics for spatial data*, Wiley, New York.
- Crihfield, J. y Panggabean, M. (1995) "Is public infrastructure productive? A metropolitan perspective using new capital stock estimates", *Regional Science and Urban Economics*, 25, 607-630.

- Cutanda, A. y Paricio, J. (1992a) "Crecimiento económico y desigualdades regionales: El impacto de la infraestructura", *Papeles de Economía Española*, 51, 83-101, y también en "Infrastructure and regional economic growth: The Spanish case", *Regional Studies*, 28(1), 69-77.
- Cutanda, A. y Paricio, J. (1992b) "Infraestructura y Crecimiento Económico: El Caso de las Comunidades Autónomas", *Instituto Valenciano de Investigaciones Económicas*, WP-EC 92-05.
- Chambers, R. (1988): *Applied production analysis*, Cambridge, Cambridge University Press.
- Chernoff, M. (1978) "Density as a determinant of highway impacts", *Transportation Research Record*, 686, 4-9.
- Cheshire, P. y Carbonaro, G. (1995) "Convergence-Divergence in regional growth rates: An empty black box?", en H. Armstrong y R. Vickerman (Eds.) *Convergence and Divergence among European Regions*. Pion, London.
- Chipman, J. (1970) "External economies of scale and competitive equilibrium", *Quarterly Journal of Economics*, 84, 347-385.
- Chunrong A. and Cassou, S.P. (1997) "On public capital analysis with state data", *Economic Letters*, 57, 209-212.
- Da Silva, J., Ellson, R.W. y Martin, R.C. (1987) "Public capital, regional output and development: Some empirical evidence", *Journal of Regional Science*, 27, 419-437.
- Dacey, M. (1968) "A review of measures of contiguity for two and K-Color maps", en B. Berry y D. Marble (Eds.) *Spatial Analysis: A reader in statistical geography*, Englewood Cliffs, N.J., Prentice-Hall.
- Dalamagas, B. (1995) "A reconsideration of the public sector's contribution to growth" *Empirical Economics*, 20, 385-414.
- Dalenberg, D.R. y Eberts, R.W. (1992) "Estimates of the manufacturing sector's desired level of public capital: A cost function approach", *Comunicación presentada en el Annual Meeting of the Western Economic Association*, San Francisco, CA, July.
- David, P. y Greenstein, S. (1990) "The economics of compatibility and standards: An introduction to recent research", *Economics of Innovation and New Technology*, 1, 3-42.
- Davidson, R. y Mackinnon, J.G. (1993) *Estimation and inference in econometrics*, Oxford University Press, New York, 320-325.
- Day, R.H. y Zou, G. (1994) "Infrastructure, restricted factor substitution and economic growth", *Journal of economic behaviour and organization*, 23, 149-166.
- Dalenberg, D.R. (1987) *Estimates of elasticities of substitution between public and private inputs in the manufacturing sector of metropolitan areas*, Tesis Doctoral, University of Oregon.
- de la Fuente, A. (1992) "Histoire d'A: Crecimiento y progreso técnico", *Investigaciones Económicas*, XVI, 3, Sept., 331-391.

- de la Fuente, A. (1993) "Capital público y productividad", en *Crecimiento y convergencia regional en España y Europa*, 1, 199-247. Instituto de Análisis Económico, CSIC. Barcelona.
- de la Fuente, A. (1995) " Inversión, *catch-up* tecnológico y convergencia real", *Papeles de Economía Española*, 63, 18-34.
- de la Fuente, A. (1996) "Infraestructuras y productividad: Un panorama y algunos resultados para las regiones españolas", *Documento de Trabajo del Instituto de Análisis Económico de la Universidad Autónoma de Barcelona*, PT.52.96.
- de la Fuente, A. y Vives, X. (1995) "Infrastructure and education as instruments of regional policy: Evidence from Spain", *Economic Policy*, 20, 11-54.
- De Long, J.B. y Summers, L.H. (1992) "Equipment investment and economic growth: How strong is the nexus", *Brooking Papers on Economic Activity*, 2, 157-211.
- De Lucio, J.J. (1997) "Agglomeration, growth and the diffusion of knowledge", *Comunicación presentada en el XXII Simposio de Análisis Económico*, Barcelona (España),
- De Lucio, J.J., Herce, J.A. y Goicolea, A. (1996) "Externalities and industrial growth: Spain 1978-1992", *Comunicación presentada en el 36th European Regional Science Association Congress*, Zurich (Suiza).
- De Rus, G. (1995) "Infraestructuras", *Economistas*, 64, 546-547.
- De Rus, G., Román, C. y Trujillo, L. (1995) "Convergencia en infraestructuras de transporte", *Economistas*, 64, 563-570.
- Delgado, M.J. (1995) "The economic impacts of public capital formation to the regional development", *Comunicación presentada en el 35th European Regional Science Association Congress*, Agosto, 1995.
- Diamond, J. (1989) "Government expenditure and economic growth: An empirical investigation." *Finance of Development*, 27(4), 34-36.
- Dickey, D.A. y Fuller, W.A. (1979) "Distribution of the estimators for autoregressive time series with a unit root", *Journal of the American Statistical Association*, 74, 427-431.
- Diewert, W.E. (1971) "An application of the Shephard duality theorem: A generalized Leontief production function", *Journal of Political Economy*, 79, 481-507.
- Diewert, W.E. (1973) "Functional forms for profit and transformation functions", *Journal of Economic Economy*, 6, 284-316.
- Diewert, W.E. (1974) "Applications of duality theory", en M.D. Intriligator y D.A. Kendrick, (Eds.), *Frontiers of Quatitative Economics*, vol. II, Amsterdam: North Holland, 106-120.
- Diewert, W.E. (1986) "The measurement of the economic benefits of infrastructure services", *Lecture Notes in Economics and Mathematical Systems*, 278, Springer-Verlag. Berlín.
- Doll, J.P. y Orazem, F. (1984) *Production Economics. Theory with applications*, Wiley.

- Dollar, D. y Wolff, E. (1988) "Convergence of industry labor productivity among advanced economies, 1963-1982", *The Review of Economics and Statistics*, 70, 549-558.
- Doménech, R. (1993) "Funciones de costes para la banca española: Un análisis con datos de panel", *Investigaciones Económicas*, XVII(2), 263-284.
- Dowrick, S. (1989) "Sectoral change, catching up and slowing down: OECD post-war economic growth revisited", *Economics Letters*, 31, 331-335.
- Dowrick, S. y Gemmell, N. (1991) "Industrialization, catching up and economic growth: A comparative study across the world's capitalist economies", *The Economic Journal*, 101, 263-275.
- Draper, M. y Herce, J.A. (1994) "Infraestructuras y crecimiento: un panorama", *Revista de Economía Aplicada*, 6(II), 129-168. También en Draper, M. y Herce, J.A. (1993) "Infraestructuras", *FEDEA*, DT-9307.
- Duffy-Deno, K. (1988) "The effect of public capital on US manufacturing activity: 1970-1978", *Southern Economic Journal*, 55(2), 400-411.
- Duffy-Deno, K.T. (1991) "Public capital and the factor intensity of the manufacturing sector", *Urban Studies*, 28(1), 3-14.
- Duffy-Deno K.T. (1993) "The Municipal wage and employment effects of public infrastructure", *Urban Studies*, 30, 9, 1577-1589.
- Duffy-Deno, K.T. y Eberts, R. (1989) "Public infrastructure and regional economic development: A simultaneous equations approach", *Federal Reserve Bank of Cleveland*, DT-8909.
- Duffy-Deno, K.T. y Eberts, R. (1991) "Public infrastructure and regional economic development: A simultaneous equations approach", *Journal of Urban Economic*, 30(3), 329-343.
- Duggal, V.G., Saltzman, C. y Klein, L.R. (1995) "Infrastructure and productivity: A nonlinear Approach", *Comunicación presentada en el 7th World Congress of the Econometric Society*, Tokyo, Japan.
- Durlauf, S.N. (1991) "Nonergodic economic growth", *NBER-3719*.
- Durlauf, S.N. y Quah, D.T. (1998) "The new empirics of economic growth", *CEPR Discussion Paper*, 384 y *NBER-6422*.
- Eaton, J. y Kortum, S. (1993) "International technology diffusion", *Mimeo, Boston University*.
- Eberts, R. (1986) "Estimating the contribution of urban public infrastructure to regional growth", *Federal Reserve Bank of Cleveland*, DT-8610.
- Eberts, R. (1989) "Public infrastructure and regional economic development", *Economic Review, Federal Reserve Bank of Cleveland*.
- Eberts, R. (1990) "Cross-sectional analysis of public infrastructure and regional productivity growth", *Federal Reserve Bank of Cleveland*, DT-9004.

- Eberts, R. y Fogarty, M. (1987) "Estimating the relationship between local public and private investment", *Federal Reserve Bank of Cleveland*, DT-8703.
- Eisner, R. (1991) "Infrastructure and regional economic performance: Comment", *New England Economic Review*. Septiembre-Octubre, 47-58.
- Eisner, R. (1994) "Real government saving and the future", *Journal of Economic Behavior and Organization*, 23, 111-126.
- Engelbrecht, H.-J. (1997) "International R&D spillovers, human capital and productivity in OECD economies: An empirical investigation", *European Economic Review*, 41, 1479-1488.
- Erenburg, S.J. (1993) "The relationship between public and private investment", *Jerome Ley Economics Institute*, WP-85, February.
- Erenburg, S.J. y Wohar, M.E. (1995) "Public and private investment: Are there causal linkages?", *Journal of Macroeconomics*, 17, 1-30.
- Esteban, J.M. y Gómez (1991) "Anàlisi de la distribució territorial de la inversió pública. El finançament de les comunitats autònomes: Avaluació del sistema actual i criteris per a la seva reforma", *Generalitat de Catalunya, Departament d'Economia i Finances*.
- Evans, P. y Karras, G. (1994a) "Is Government capital productive? Evidence from a panel of seven countries", *Journal of Macroeconomics*, 16(2).
- Evans, P. y Karras, G. (1994b) "Are Government activities productive? Evidence from a panel of US states", *Review of Economics and Statistics*, LXXVI(1), 1-11.
- Fernández, A. (1994) "La inversió pública a les comunitats autònomes. Període 1987-1990", *Generalitat de Catalunya, Departament d'Economia i Finances. Nota d'Economia*, 49, 107-128.
- Fisher, W.D. (1971) "Econometric estimation with spatial dependence", *Regional and Urban Economics*, 1, 19-40.
- Fisher, F., Levhari, L. y Sheshinski, E. (1969) "On the sensitivity of the level of output to savings: Embodiment and disembodiment: A clarificatory note", *Quarterly Journal of Economics*, 347-348.
- Florax, R. y Folmer, H. (1991) "Robust testing for spatial correlation among residuals of linear models: Some Monte Carlo results for an irregular lattice structure", *Wageningen Agricultural University, Wageningen, The Netherlands*.
- Florax, R. y Folmer, H. (1992) "Specification and estimation of spatial linear regressions models. Monte Carlo evaluation of pre-test estimators", *Regional Science and Urban Economics*, 22, 405-432.
- Flores De Frutos, R., Gracia, M. y Pérez, T. (1994) "Effects of public investment in infrastructure on the Spanish economy", *ICAE*, DT-9404.
- Ford, R. y Poret, P. (1991) "Infrastructure and private sector productivity", *OECD Economic Studies*, 17, 63-89.
- Forslund, U.M. y Johansson, B. (1995) "Assessing road investments: accessibility changes, cost benefit and production effects", *Annals of Regional Science*, 29, 15-174.

- Foster, S., y Gorr, W. (1983) "Adaptive filtering approaches to spatial modeling", *Modeling and Simulation*, 14, 745-750.
- Foster, S., y Gorr, W. (1984) "Spatial adaptive filtering", *Modeling and Simulation*, 15, 29-34.
- Foster, S., y Gorr, W. (1986) "An adaptive filter for estimating spatially-varying parameters: Application to modeling police hours spent in response to calls for service", *Management Science*, 32, 878-889.
- Fox, W.F. y Murray, M.N., (1990) "Local public policies and interregional business development", *Southern Economic Journal*, 57(2), 413-427.
- Fox, W.F. y Murray, M.N., (1991) "The effects of local government public policies on the location of business activity", en H.W. Herzog y A.M. Schlottmann (Eds.) *Industry Location and Public Policy*, The University of Tennessee Press, Knoxville.
- Freeman, C. (1986) *The economics of industrial innovation*, MIT Press, Massachussets.
- Frutos, M.A. (1991) "Una evaluación del stock de capital público", en *La Financiación de la Comunidades Autónomas: Evaluación del sistema actual y criterios para su reforma*, IAE, Barcelona.
- Fujita, M. y Thisse, J.F. (1996) "Economics of agglomeration", *Discussion Paper CEPR-1344*.
- Fuller, W.A. y Battese, G.E. (1973) "Transformation for estimation of linear models with nested error structure", *Journal of the American Statistical Association*, 68, 626-632.
- Fuller, W.A. y Battese, G.E. (1974) "Estimation of linear models with cross-error structure", *Journal of Econometrics*, 2, 67-78.
- Fundación BBV (1995) "El stock de capital en la economía española", Bilbao.
- García-Fontes, W. y Serra, D. (1993a) "Capital público, infraestructura y crecimiento", *Crecimiento y convergencia regional en España y en Europa*, Vol.2, 453-475. Instituto de Análisis Económico, CSIC. Fundación de Economía Analítica. Barcelona.
- García-Fontes, W. y Serra, D. (1993b) "Infraestructura y productividad", *Crecimiento y convergencia regional en España y en Europa*. Vol.1, 177-196. Instituto de Análisis Económico, CSIC. Fundación de Economía Analítica. Barcelona.
- García-Milà, T. (1990) "Un modelo dinámico con capital público y su estimación por simulación", *Investigaciones Económicas*, XIV(3), 369-383.
- García-Milà, T. y McGuire, T. (1992) "The contribution of publicly provided inputs to states' economies", *Regional Science and Urban Economics*, 22, 229-241.
- García-Milà, T. y Marimon, R. (1995) "Integración regional e inversión pública en España" en *La economía española: Una visión diferente*, Ed. Bosch, 197-256.
- García-Milà, T., McGuire, T. y Porter, R.H. (1996) "The effect of public capital in state-level production functions reconsidered" *The Review of Economic and Statistics*, LXXVIII, 177-180.

- Geary, R. (1954) "The contiguity ratio and statistical mapping." *The Incorporated Statistician*, 5, 115-145.
- Gerschenkron, A. (1952) "Economic Backwardness in historical perspective" en Bert Hoselitz (Ed.), *The progress of underdeveloped areas*, Chicago, 3-29.
- Getis, A. y Ord, J.K. (1992) "The analysis of spatial association by use of distance statistics", *Geographical Analysis*, 24, 189-206.
- Giersch, H. (1950) "Probleme der regionalen Einkommensverteilung", en *Probleme des räumlichen Gleichgewichtes*.
- Gillis, W.R. (1989) Introduction: The relevance of rural transportation, in W.R. Gillis (Ed.) *Profitability and Mobility in Rural America*, 3-14. University Park, PA: The Pennsylvania State University Press.
- Glaeser, E., Kallal, H., Scheinkman, J.A. y Shleifer, A. (1992) "Growth in cities", *Journal of Political Economy*, 100(6), 1126-1152.
- Glomm, G. y Ravikumar, B. (1994) "Public investment in infrastructure in a simple growth model", *Journal of Economic Dynamics and Control*, 18, 1173-1187.
- Godfrey, L. (1981) "On the invariance of the Lagrange Multiplier tests with respect to certain changes in the alternative hypothesis", *Econometrica*, 49, 1443-1455.
- González-Finat, A. (1995) "La política de redes transeuropeas: un año significativo", *Economistas*, 64, 571-576.
- González-Páramo, J.M. (1995) "Infraestructuras, productividad y bienestar", *Investigaciones Económicas*, XIX(1), 155-168.
- Gramlich, E. (1994) "Infrastructure investment: A review essay", *Journal of Economic Literature*, XXXII, 1176-1196.
- Greene, W. (1997) *Econometric Analysis*, Macmillan, New York.
- Griffith, D.A. (1992) *Spatial regression analysis on the PC spatial statistics using SAS*. Department of Geography and Interdisciplinary Statistics Program, Syracuse University.
- Griliches, Z. (1988) "Productivity puzzles and R&D: Another nonexplanation", *Journal of Economic Perspectives*, 2, 9-21.
- Griliches, Z. (1992) "The search for R&D spillovers", *Scandinavian Journal of Economics*, 94, Supplement, 29-47.
- Grossman, G.M. y Helpman, E. (1991a) *Innovation and growth in the global economy*. Cambridge: MIT Press.
- Grossman, G.M. y Helpman, E. (1991b) "Trade, knowledge spillovers and growth", *European Economic Review*, 35(3), 517-526.
- Guilkey, D.K., Lovell, C.A. y Sickles, R. (1983) "A comparison of the performance of three flexible functional forms", *International Economic Review*, 24, 591-616.

- Haining, R. (1994) "Diagnostics for regression modeling in spatial econometrics", *Journal of Regional Science*, 34(3), 325-341.
- Hall, R.E. (1988) "The relation between price and marginal cost in U.S. industry", *Journal of Political Economy*, 96, 921-947.
- Hansen, N. (1965). "Unbalanced growth and regional development", *Western Economic Journal*, 4.
- Hansen, N. (1971). "The problem of spatial resource allocation", *Growth and Change*, 2(2), 22-24.
- Hansson, P. y Henrekson, M. (1994) "What makes a country socially capable of catching up?", *Weltwirtschaftliches Archiv*, 130 (4), 760-783.
- Hartshorne, R. (1939) *The nature of geography*, Lancaster, Peen, Association of American Geographers.
- Hausman, J.A. (1978) "Specification tests in econometrics", *Econometrica*, 52, 909-938.
- Helpman, E (1997) "R&D and productivity: the international connection", *NBER Working Paper*, 6101.
- Henderson, V. (1992) "Where does an industry locate?", *Journal of Urban Economics*, 35, 83-104.
- Herce, J.A. y Sosvilla, S. (1995) "Infraestructuras y marco de apoyo comunitario 1994-1999: Sus efectos económicos", *Economistas*, 64, 552-557.
- Hicks, J.R. (1946) *Value and capital*, Second edition. Oxford University Press, Oxford.
- Hildreth, C. y Houck, J. (1968) "Some estimators for a linear model with random coefficients", *Journal of the American Statistical Association*, 63, 584-595.
- Hirschman, A. (1958) *The strategy of economic development*. New Haven, Londres.
- Holtz-Eakin, D. (1988) "Private output, government capital and the infrastructure 'crisis'", *Discussion Paper Series*, 394. New York: Columbia University.
- Holtz-Eakin, D. (1992) "Private sector productivity and the productivity puzzle", *NBER*, DT-4122.
- Holtz-Eakin, D. (1994) "Public-sector capital and the aproductivity puzzle", *The Review of Economics and Statistics*, 76, 12-21.
- Holtz-Eakin, D. y Schwartz, A. (1995a) "Infrastructure in a structural model of economic growth", *Regional Science and Urban Economics*, 25, 131-151.
- Holtz-Eakin, D. y Schwartz, A. (1995b) "Spatial productivity spillovers from public infrastructure: Evidence from state highways", *NBER*, DT-5004.
- Holtz-Eakin, D. y Lovely, M. (1996) "Scale economies, returns to variety, and the productivity of public infrastructure", *Regional Science and Urban Economics*, 26, 105-123.
- Hordijk, L. y Paelink, J. (1976) "Some principles and results in spatial econometrics", *Reserches Economiques de Louvain*, 42(3), 175-197.

- Hordijk, L. (1979) "Problems in estimating econometric relations in space", *Papers Regional Science Association*, 42, 99-115.
- Hsiao, C. (1986) *Analysis of Panel Data*, Cambridge University Press, Cambridge.
- Hulten, C.R. y Schwab, R.M. (1991) "Is there too little public capital?", *Conference Paper, American Enterprise Institute*.
- Hulten, C.R. y Schwab, R.M. (1992) "Is there too little public capital in the U.S?" *Comunicación presentada en la conferencia sobre "Infrastructure Needs and Policy Options for the 1990s" American Enterprise Institute, Washington, D.C., February 4, 1991*.
- Inada, K-I (1963) "On a two-sector model of economic growth: Comments and a generalization", *Review of Economic Studies*, 30 (June), 119-127.
- Inglada, V. (1995) "Condicionantes y nuevas perspectivas en la política española de infraestructuras", *Economistas*, 64, 558-562.
- Isard, W. (1956) *Channels of Synthesis*.
- Isard, W. (1960) *Methods of Regional Analysis*.
- Islam, N. (1995) "Growth empirics: A panel data approach", *Quarterly Journal of Economics*, 110, 1127-1170.
- Isserman, A.J., Rephann, T.J. y Sorenson, D.J. (1989) "Highways and rural economic development: Results from a quasi-experimental approaches", *Working Paper 8907, Regional Research Institute, Morgantown, WV*.
- IVIE, Instituto Valenciano de Investigaciones Económicas (1993). Estimación del stock de capital público en España y en las Comunidades Autónomas. *Mimeo*, Valencia.
- Jacobs, J. (1969) *The economy of cities*, New York Vintage.
- Jaumandreu, J. (1987) "Producción, empleo, cambio técnico y costes relativos en la industria española, 1964-1985", *Investigaciones Económicas*, XI, 427-463.
- Jaumandreu, J. y Jiménez, Ch. (1992) "Índices de precios para la Encuesta Industrial", *Programa de Investigaciones Económicas*, Fundación Empresa Publica, Mimeo.
- Jochimsen, R. (1966) *Theorie der Infrastruktur*, Grundlagen der marktwirtschaftlichen Entwicklung, Tubinga.
- Johansson, B. (1993) "Infrastructure, accessibility and economic growth", *International Journal of Transport Economics*, XX(2), 132-156.
- Johansson, B. y Wigren, R. (1996) "Production milieu and competitive advantages" en D.F. Batten y C. Karlsson (Ed.) *Infrastructure and the Complexity of Economic Development*, Springer, Heidelberg, 187-212.
- Jones, C.I. (1995) "R&D-based models of economic growth", *Journal of Political Economy*, 103(4), 759-784.

Johnson, J. (1995) "The multidimensional networks of complex systems", en Batten, D.F., J.L. Casti y R. Thord (Eds.), *Networks in Action*, Springer Verlag, Berlin.

Johnston, J. (1984) *Econometric Methods*, 3ª edición, McGraw-Hill.

Jorgenson, D.W. (1963) "Capital theory and investment behaviour", *American Economic Review*, 53, 247-259.

Jorgenson, D.W. (1991) "Fragile statistical foundation: The macroeconomics of public infrastructure investment-Comment on Hulten and Schwab", *presentado en el American Enterprise Institute*, 4 de Febrero.

Judge, G.G., Hill, R.C., Griffiths, W.E., Lutkepohl, H. y Lee, T-C. (1988): *Introduction to the theory and practice of Econometrics*, Wiley, New York.

Justman, M. (1995) "Infrastructure, growth and the two dimensions of industrial policy", *Review of Economic Studies*, 62, 131-157.

Kaldor N. (1957) "A model of economic growth", *Economic Journal*, 591-624.

Kaldor N. (1961) Capital accumulation and economic growth, en F.A. Lutz y D.C. Hague (Eds) *The theory of capital*. London, McMillan, 177-220.

Kaldor N. (1962) "A new model of economic growth", *Review of Economic Studies*, 174-192.

Keeler, T.E. y Small, K.A.(1977) "Optimal peak load pricing, investment, and service levels on urban expressways", *Journal of Political Economy*, 85(1), 1-25.

Kelejian, H.H. y Robinson, D.P. (1992) "Spatial autocorrelation. A new computationally simple test with an application to per capita county police expenditures", *Regional Science and Urban Economics*, 22, 317-331.

Kelejian, H.H. y Robinson, D.P. (1993) "A suggested method of estimation for spatial interdependent models with autocorrelated errors and an application to a county expenditure model", *Papers in Regional Science*, 72, 297-312.

Kelejian, H.H. y Robinson, D.P. (1995) "Spatial correlation: A suggested alternative to the autoregressive model", en L. Anselin y R. Florax (eds.), *New Directions in Spatial Econometrics*, Springer-Verlag, Berlin, 75-95.

Kelejian, H.H. y Robinson, D.P. (1997) "Infrastructure productivity estimation and its underlying econometric specifications: a sensitivity", *Papers in Regional Science*, 76(1), 115-131.

Keller, J. (1997) "Are international R&D spillovers trade-related? Analyzing spillovers among randomly matched trade partners", *National Bureau of Economic Research*, 6065, Cambridge, MA.

Kessides, C. (1996) "A review of infrastructure's impact on economic development", en *Infrastructure and the complexity of economic development*, D.F. Batten and C. Karlsson (Ed.), Springer-Verlag, Heidelberg, 213-230.

Kindleberger, C.P. (1983) "Standardas as public, collective and private goods", *Kiklos*, 3.

- King, M.L. (1981) "A small sample property of the Cliff Ord test for spatial correlation", *Journal of the Royal Statistical Society B*, 43, 263-264.
- King, M.A. y Robson, M. (1989) "Endogenous growth and the role of history", *NBER-3151*.
- Kollman, K. (1995) "The correlation of productivity growth across regions and industries in the United States", *Economics Letters*, 47, 229-250.
- Krugman, P. (1991) "Increasing returns and economic geography", *Journal of Political Economy*, 99(3), 183-499.
- Krugman, P. (1992) *Geografía y comercio*. Ed. Antoni Bosch.
- Krugman, P. (1993) "First nature, second nature and metropolitan location", *Journal of Regional Science*, 33(2), 129-144.
- Krugman, P. y Venables, A. (1990) "Integration and the competitiveness of peripheral industry", en C. Bliss y J. Braga de Macedo, eds., *Unity with Diversity in the European Community*, Cambridge: Cambridge University Press.
- Krugman, P. y Venables, A. (1995a) "Globalization and the inequality of nations", *Quarterly Journal of Economics*, 110, 857-880.
- Kubo, Y. (1995) "Scale economies, regional externalities and the possibility of uneven regional development", *Journal of Regional Science*, 35, 318-328.
- Kuroda, T. (1989) "Location of public facilities with spillover effects: Variable location and parametric scale", *Journal of Regional Science*, 29(4), 575-594.
- Lajugie, J., Delfaud P. y Lacour, C. (1985) *Espace regional et aménagement du territoire*, Dalloz, Paris.
- Landes, D. (1969) *The unbound prometheus*. Cambridge University Press, Cambridge.
- Lehvari, D. (1966) "Further implications of 'Learning by doing'", *Review of Economic Studies*, Jan. 31-39.
- Lichtenberg, F. (1992) "R&D investment and international productivity differences", *NBER*, WP-4162.
- Looney, R.E. (1992) "Infrastructural constraints on transport and communications: the case of Pakistan", *International Journal of Transport Economics*, XIX(3), 287-306.
- Looney, R.E y Frederiksen, P. (1981) "The regional impact of infrastructure in Mexico", *Regional Studies*, 15(4), 285-296.
- López-Bazo, E., Suriñach, J. y Sansó, A. (1993) "Análisis de integrabilidad de variables económicas y relaciones de largo plazo. Una aplicación", *Departamento de Econometría, Estadística y Economía Española de la Universidad de Barcelona*, DT-9204.
- López-Bazo, E., Vayá, E., Mora, A.J. y Suriñach, J. (1998a) "Regional economic dynamics and convergence in the European Union", *The Annals of Regional Science*, forthcoming.

- López-Bazo, E., Vayá, E., Moreno, R. y Suriñach, J. (1998b) "Grow, neighbour, grow, grow...neighbour be good!", presentado en el 36th *European Regional Science Association Congress*, Viena (Austria).
- Lösch, A. (1939) *Die räumliche ordnung der wirtschaft*, Jena.
- Lucas, R. (1985) "Methods and problems in business cycle theory", en *Studies in Business Cycle Theory*, MIT Press, Cambridge Mass, 271-296.
- Lucas, R. (1988) "On the mechanics of economic development", *Journal of Monetary Economics*, 22, 3-42.
- Lucas, R. (1993) "Making a miracle", *Econometrica*, 61(2), 251-272.
- Lynde, C. (1992) "Private profit and public capital", *Journal of Macroeconomics*, 14(1), 125-142.
- Lynde, C. y Richmond, J. (1992) "The role of public capital in production", *The Review of Economics and Statistics*, 74, 37-44.
- Lynde, C. y Richmond, J. (1993a) "Public capital and total factor productivity", *International Economic Review*, 34, 401-414.
- Lynde, C. y Richmond, J. (1993b) "Public capital and long-run costs in U.K manufacturing", *The Economic Journal*, 103, 880-893.
- MacLoughlin, J.B. (1972) *Urban and regional planning. A system approach*. Faber and Faber, Londres.
- Maddala, G.S. (1993) *The econometrics of panel data*, vol. I y II, The International library of critical writings in econometrics, an Elgar reference collection, Cambridge University Press, Cambridge.
- Mankiw, N.G., Romer, D y Weil, D.N. (1992) "A contribution to the empirics of economic growth" *Quarterly Journal of Economics*, 107, 407-437.
- Marshall, A. (1920) *Principles of Economics*, MacMillan and C^o, London, 8^a edición (versión castellana *Principios de Economía*, Ed. Aguilar, Madrid 1963, 4^a edición).
- Martin, R.C. (1979) "Federal regional developmet programs and US problem areas", *Journal of Regional Science*, 19, 157-170.
- Martin, P. y Rogers, C.A. (1995) "Industrial location and public infrastructure", *Journal of International Economics*, 39, 335-351.
- Mas, M., Pérez, F., Uriel, E. y Maudos, J. (1993) "Dotaciones del capital público y su distribución regional en España", *IVIE WP-EC 93-04*.
- Mas, M., Pérez, F., Uriel, E. y Maudos, J. (1994) "Capital público y productividad en las regiones españolas", *Moneda y Crédito*, 198, 163-206.
- Mas, M., Pérez, F. y Maudos, J. (1995a) "Fuentes de crecimiento económico provincial: 1967-1991", *Mimeo*.

- Mas, M., Maudos, J., Pérez, F. y Uriel, E. (1995b) Growth and convergence in Spanish provinces, en H. Armstrong y R. Vickerman, (Eds.) *Convergence and Divergence among European Regions*. Pion, London.
- Mas, M., Maudos, J., Pérez, F. y Uriel, E. (1996a) "Infrastructures and productivity in the Spanish regions", *Regional Studies*, 30(7), 641-649.
- Mas, M., Pérez, F., Uriel, E. y Maudos, J. (1996b) "Public capital and productive efficiency in the Spanish regions (1964-1991)", *Comunicación presentada en el 36th European Regional Science Association Congress*, 26-30 Agosto, 1996, Zurich.
- Massey, D. y Meegan, R. (1985) "Introduction: The debate" en D. Massey and R. Meegan (eds.) , *Politics and Method*, London, Methuen, 1-12.
- Matyas, L. y Sevestre, P. (1996) *The econometrics of panel data: A handbook of the theory with applications*, Kluwer Academic Publishers, Second revised edition, Dordrecht, The Netherlands.
- Matsuyama, K. y Takahashi, T. (1993) "Self-defeating regional concentration", *NBER*, WP-4484, Cambridge, MA.
- Meade, J.E. (1952) "External economies and diseconomies in a competitive situation", *Economic Journal*, 62, 54-67.
- Mera, K. (1973) "Regional production functions and social overhead capital: an analysis of the Japanese case", *Regional and Urban Economics*, 3(2), 157-186.
- Merriman, D. (1990) "Public capital and regional output. Another look at some Japanese and American data", *Regional Science and Urban Economics*, 19, 659-673.
- Milner, C. y Westaway, T. (1993) "Country size and the medium-term growth process: Some cross-country evidence", *World-Development*, 21(2), 203-211.
- Ministerio de Economía y Hacienda (1989) "Boletín de información estadística del sector público. Notas metodológicas", *Intervención General de la Administración del Estado*.
- Ministerio de Economía y Hacienda (1993) "Elaboración de la metodología para la evaluación de los Marcos de Apoyo Comunitarios 1989-1993 de las regiones objetivo número 1", *Dirección General de Planificación del Ministerio de Economía y Hacienda*.
- Ministerio de Transportes, Turismo y Comunicaciones (1989) "III Encuesta Nacional del Transporte de Mercancías por Carretera", *RENFE, Madrid*.
- Mohring, H. y Harwitz, M. (1962) *Highway benefits: an analytical framework*. Evanston, IL : Northwestern University Press.
- Molho, I. (1995) "Spatial autocorrelation in British unemployment", *Journal of Regional Science*, 35, 641-658.
- Moore, B., Tyler, P. y Elliott, D. (1991) "The influence of regional development incentives and infrastructure on the location of small and medium, sized companies in Europe", *Urban Studies*, 28(6), 1001-1026.

- Moran, P. (1948) "The interpretation of statistical maps", *Journal of the Royal Statistical Society*, 10, 243-251.
- Moran, P. (1950) "A test for serial independence of residuals", *Biometrika*, 37, 178-181.
- Moreno, R. (1995) "Los efectos de las infraestructuras en el crecimiento económico", *Trabajo de Investigación del Departamento de Econometría, Estadística y Economía Española de la Universidad de Barcelona*.
- Moreno, R. (1996) "Efectos sectoriales, espaciales y umbral en el análisis del papel del capital público en el desarrollo regional español", *Documento de Trabajo del Grupo de Análisis Cuantitativo Regional del Departamento de Econometría, Estadística y Economía Española de la Universidad de Barcelona (Tesina de Licenciatura)*.
- Moreno, R. (1997) "Infraestructures, input substitution and manufacturing industries performance", *Comunicación presentada en el XXII Simposio de Análisis Económico*, Barcelona.
- Moreno, R., Artís, M., López-Bazo, E. and Suriñach, J. (1997): "Evidence on the complex link between infrastructure and regional growth", *International Journal of Development Planning Literature*, 12(1&2), pp. 81-108.
- Mori, T. (1995) "A model of megapolis. The maturing of city systems", *Mimeo, University of Pennsylvania*.
- Morrison, C.J. (1988) "Quasi-fixed inputs in U.S. and Japanese manufacturing: A generalized Leontief restricted cost function approach", *The Review of Economics and Statistics*, 70(2), 275-287.
- Morrison, C.J. y Schwartz, A.E. (1992) "State infrastructure and productive performance", *NBER DT-3981*.
- Morrison, C.J. y Schwartz, A.E. (1996a) "State infrastructure and productive performance", *The American Economic Review*, 1095-1111.
- Morrison, C.J. y Schwartz, A.E. (1996b) "Public infrastructure, private input demand, and economic performance in New England manufacturing", *Journal of Business & Economic Statistics*, 14,(1), 91-101.
- Morrison, C.J. y Siegel D. (1997) "External capital factors and increasing returns in U.S. manufacturing", *The Review of Economics and Statistics*, 647-654.
- Mulligan, C.B. y Sala-i-Martin, X. (1993) "Transitional dynamics in two-sector models of endogenous growth", *Quarterly Journal of Economics*, 108(3), 737-773.
- Mullen, J.K., Williams, M. y Moomaw, R.L. (1996) "Public capital stock and interstate variation in manufacturing efficiency", *Journal of Policy Analysis and Management*, 15(1), 51-67.
- Munnell, A.H. (1990a) "Why has productivity growth declined? Productivity and public investment", *New England Economic Review. Federal Reserve Bank of Boston*, 3-22.
- Munnell, A.H. (1990b) "How does public infrastructure affect regional economic performance?", *New England Economic Review*, 11-32.

- Munnell, A.H. (1992) "Infrastructure investment and productivity growth", *Journal of Economic Perspectives*, 6(4), 189-198.
- Munnell, A.H. (1993) "An assessment of trends and economic impacts of infrastructure investment" en *Infrastructure Policies for the 1990s*, OECD, Paris.
- Munnell, A.H. y Cook, L.M. (1990) "How does public infrastructure affect regional economic performance?" en A.H. Munnell (Ed.), *Is There a Shortfall in Public Capital Investment?*, Federal Reserve Bank of Boston, Boston.
- Mur, J. (1990) *Correlación espacial. Un estudio de Monte Carlo*, Tesis Doctoral del Departamento de Análisis Económico, Universidad de Zaragoza.
- Mur, J. (1992) "Contrastes de autocorrelación espacial. Un estudio de Monte Carlo", *Estadística Española*, 34(130), 285-307.
- Murphy, K.M., Shleifer, A. y Vishny, R. (1989) "Industrialization and the big push", *Journal of Political Economy*, 97(5), 1003-1026.
- Musgrave, R. (1959) *The Theory of Public Finance*, McGraw-Hill, New York.
- Nadiri, I. y Mamuneas, T. (1991). "The effects of public infrastructure and R&D capital on the cost structure and performance of U.S. manufacturing industries", *NBER*, DT-3887.
- Nadiri, I. y Mamuneas, T. (1994) "The effects of public infrastructure and R&D capital on the cost structure and performance of U.S. manufacturing industries", *The Review of Economics and Statistics*, LXXVI(1), 189-198.
- Nadiri, I. y Kim, S. (1996) "International R&D spillovers, trade and productivity in major OECD countries", *NBER*-5801, October.
- Negishi, T. (1973) "The excess of public expenditures on industries", *Journal of Public Economics*, 2, 231-240.
- Nelson, R. y Wright, G. (1992) "The rise and fall of American technological leadership: The postwar era in historical perspective", *Journal of Economic Literature*, XXX, 1931-1964.
- Nieves, J.A. (1992) "Evolución Temporal y Distribución Territorial Institucional y Modal de las Inversiones en Infraestructuras del Transporte No Urbano. Período 1980-1990", *Ministerio de Economía y Hacienda. Secretaría de Estado de Hacienda. Dirección General de Planificación*. Documento de trabajo SGCIP-D-92004.
- Nieves, J.A. y Piñero, J.M. (1992) "La Dotación de Infraestructuras del Transporte en las Comunidades Autónomas", *Ministerio de Economía y Hacienda. Secretaría de Estado de Hacienda. Dirección General de Planificación*. Documento de trabajo SGCIP-D-92005.
- Nijkamp, P. y Paelinck, J.H.P. (1975) *Operational theory and method in regional economics*, Lexington Books, Lexington, MA.
- Nijkamp, P. (1986) "Infrastructure and regional development: a multidimensional policy analysis" *Empirical Economics*, 11, 1-21.

- Nordhaus, W. (1967) "The optimal reate and direction of technical change", en Darl Shell (editor) *Essays on the Theroy of Optimal Economic Growth*, MIT Press, 53-66.
- Nordhaus, W. (1969) "An economic theory of technological change", *American Economic Review*, Mayo, 18-28.
- Novalés, A. (1993) *Econometría*. Ed. McGraw-Hill. Madrid.
- Ord, J.K. (1975) "Estimation methods for models of spatial interaction", *Journal of the American Statistical Association*, 70, 120-126.
- Otto, G. y Voss, G.M. (1994) "Public capital and private sector productivity", *The Economic Record*, 70, 121-132.
- Paelinck, J.H.P. y Klassen, L.H. (1979) *Spatial Econometrics*. Farnborough, Saxon House.
- Paelinck, J.H.P (1985) *Elements d'analyse economique spatiale*. Editions Regionales Europeennes, Geneve.
- Peck, F.W. (1996) "Regional development and the production of space: the role of infraestructure in the attraction of new inward investment", *Environment and Planning*, 28, 327-339.
- Perroux, F. (1954) *L'Europe sans rivages*, Presses Universitaires de France, Paris.
- Peschel, K. (Ed.) (1997) *Regional Growth and Regional Poliy within the Framework of European Integration*, Springer-Verlag, Heidelberg.
- Phillips, P.C.B. y Hansen, B.E. (1990) "Statistical inference in instrumental variables regression with I(1) processes", *Review of Economic Studies*, 57, 99-125.
- Pinnoi, N. (1994) "Public infraestructure and private production. Measuring relative contributions", *Journal of Economic Behavior and Organization*, 23, 127-148.
- Porter, M. (1990) "Increasing returns and long-run growth", *Journal of Political Economy*, 94, 1002-1037.
- Puga, D y Venables, A.J. (1996) "The spread of industry: spatial agglomeration in economic development", *Journal of the Japanese and International Economics*, 10, 440-464.
- Quah, D.T. (1996) "Regional convergence clusters across Europe", *European Economic Review*, 40, 951-958.
- Quah, D.T. (1997) "Empirics for growth and distribution: polarization, stratification and convergence clubs", *Journal of Economic Growth*, 2(1), 27-59.
- Quandt, R. (1958) "The estimation of the parameters of a linear regression system obeying two separate regimes", *Journal of the American Statistical Association*, 53, 873-880.
- Ram, R. y Ramsey, D.D. (1989) "Government capital and private output in the United states. Additional evidence", *Economic Letters*, 30, 223-226.

- Ratner, J.B. (1983) "Government capital and the production function for U.S. private output", *Economic Letters*, 13, 213-217.
- Ravallion, M. y Jalan, J. (1996) "Growth divergence due to spatial externalities", *Economics Letters*, 53, 227-232.
- Raymond-Bara, J.L. (1989) "Productividad de los factores y expansión del sector público en España", *Fundación Fondo para la Investigación Económica y Social*, DT-40/1989, Madrid.
- Rephann, T.J. (1993) "Highway investment and regional economic development: decision methods and empirical foundations", *Urban Studies*, 30(2), 437-450.
- Rietveld, P. (1989) "Infrastructure and regional development", *The Annals of Regional Science*, 23, 255-274.
- Rietveld, P. (1995) "Infrastructure and spatial economic development", *Annals of Regional Science*, 29, 117-119.
- Rietveld, P. y Boonstra, J. (1995) "On the supply of network infrastructures. Highways and railways in European regions", *Annals of Regional Science*, 29, 207-220.
- Rodríguez-Pose, A. (1998) "Innovation prone and innovation averse societies: the passage from R&D to economic performance in Europe", *London School of Economics*, Mimeo.
- Romer, P. (1986) "Increasing returns and long-run growth", *Journal of Political Economy*, 94(5), 1002-1037.
- Romer, P. (1989) "Increasing returns and new developments in the theory of growth", *NBER WP*-3098.
- Romer, P. (1990) "Rendimientos crecientes y nuevos desarrollos en la teoría del crecimiento", *Cuadernos económicos de ICE*, 46(3), 279-305.
- Rosenberg, N. (1972) *Technology and American economic growth*, Harper and Row. New York.
- Sala-i-Martin, X. (1995) "El aprendizaje por la práctica y el desbordamiento del conocimiento", *Apuntes de crecimiento económico*, cap. 7, 95-115, Ed. Bosch.
- Sala-i-Martin, X. (1997) "És bo que el govern inverteixi "sempre" a les regions menys desenvolupades?", *Nota d'Economia*, 57, Enero, 123-168.
- Samuelson, P.A. (1954) "The pure theory of public expenditure", *Review of Economics and Statistics*, 36 (November), 387-389.
- Sasaki, K., Kuihisa, S. y Sugiyama, M. (1995) "Evaluation of road capacity and its spatial allocation", *The Annals of Regional Science*, 29, 143-154.
- Saxenian, A. (1994) *Regional advantage culture and competition in Silicon Valley and Route 128*, Cambridge Mass: Harvard University Press.
- Scitowsky, T. (1954) "Two concepts of external economies", *Journal of Political Economy*, 62, 143-151.

- Schankerman, M. y Nadiri, M.I. (1986) "A test of static equilibrium models and rates of return to quasi-fixed factors, with an application to the bell system", *Journal of Econometrics*, 33, 97-118.
- Scherer, F. (1984) *Innovation and Growth: Schumpeterian Perspectives*, MIT Press.
- Schultz, T. (1960) "Capital formation by education", *Journal of Political Economy*, 571-583.
- Schultz, T. (1961) "Investment in human capital", *American Economic Review*, 1-17.
- Seitz, H. (1993) "A dual economic analysis of the benefits of the public road network", *The Annals of Regional Science*, 27, 223-239.
- Seitz, H. (1994) "Public capital and the demand for private inputs", *Journal of Public Economics*, 54, 287-307.
- Seitz, H. (1995) "The productivity and supply of urban infrastructures", *The Annals of Regional Science*, 29, 121-141.
- Seitz, H. y Licht, G. (1995): "The impact of public infrastructure capital on regional manufacturing production cost", *Regional Studies*, 29(3), pp. 231-240.
- Shah, A. (1992) "Dynamics of public infrastructure, industrial productivity and profitability", *Review of Economics and Statistics*, 74(1), 28-36.
- Shell, K. (1966) "Toward a theory of inventive activity and capital accumulation", *American Economic Review*, 2, 62-68.
- Shephard, R.W. (1953) *Cost and production functions*, Princeton, N.J. Princeton University Press.
- Sheshinski, E. (1967) "Optimal accumulation with learning by doing" en K. Shell (Ed.), *Essays on the theory of optimal economic growth*, MIT Press.
- Simon, H.A. (1978) "Rationality as process and as product of thought", *American Economic Review*, 68, 1-16.
- Small, K.A. (1983) "The incidence of congestion tolls on urban highways", *Journal of Urban Economics*, 13(1), 90-111.
- Smith, A. (1776) *An inquiry into the nature and causes of the wealth of nations*, editado en 1937 por Edwin Canaan Ed.
- Solow, R. (1956) "A contribution to the theory of economic growth", *Quarterly Journal of Economics*, 70(1) (February), 65-94.
- Solow, R. (1957) "Technical change and the aggregate production functions", *Review of Economic and Statistics*, 39, 312-320.
- Stern, N. (1991) "The determinants of economic growth", *Economic Journal*, 101(404), 122-133.
- Stigler, G. (1951) "The division of labor is limited by the extent of the market", *Journal of Political Economy*, LIX(3), 185-193.

- Stokey, N. (1988) "Learning by doing and the introduction of new goods", *Journal of Political Economy*, XCVI, 63-80.
- Student, B. (1914) "The elimination of spurious correlation due to position in time or space", *Biometrika*, 10, 179-180.
- Sturm, J.E. y de Haan, J. (1995), "Is public expenditure really productive? New evidence for the US and the Netherlands", *Economic Modelling*, 12, 60-72.
- Sturm, J.E. (1997) "The impact of public infrastructure capital on the private sector of the Netherlands. An application of the symmetric generalized McFadden cost function", *CPB Netherlands Bureau for Economic Policy Analysis*, La Haya, N. 00.
- Suárez, F.J. (1992) "Economías de escala, poder de mercado y externalidades: Medición de las fuentes del crecimiento español", *Investigaciones Económicas*, XVI(3), 411-441.
- Suriñach, J., Artís, M., López-Bazo, E y Sansó, A. (1995) *Análisis económico regional. Nociones básicas de la Teoría de la Cointegración*, Antoni Bosch Ed.
- Swan, T.W. (1956) "Economic growth and capital accumulation", *Economic Record*, 32 (november), 334-361.
- Tatom, J.A. (1991) "Public capital and private sector performance", *Federal Reserve Bank of St. Louis Review*, 73(3), 3-15.
- Terleckyj, N. (1974) *Effects of R&D on the productivity growth of industries: An exploratory study*, Washington, DC: National Planning Association.
- Thünen, J.H. von (1826) *Der isolirte staat in beziehung auf landwirtschaft und nationalökonomie*, Hamburgo.
- Tirole, J. (1990) "Investigación y desarrollo y adopción de nuevas tecnologías", *La Teoría de la Organización Industrial*, cap. 10, 590-625, Ed. Ariel Economía.
- Tobler, W. (1979) "Cellular geography", en *Philosophy in Geography*, 379-386. Ed. S. Gale y G. Olson.
- Utrilla, A. (1991) "Los indicadores de necesidad de infraestructuras y el efecto redistributivo del Fondo de Compensación Interterritorial", *Universidad Complutense de Madrid, Facultad de Ciencias Económicas y Empresariales*, DT-9121.
- Vayá, E. (1995) "La importancia de los efectos espaciales en la modelización econométrica", *Documento de Trabajo del Grupo de Análisis Cuantitativo Regional del Departamento de Econometría, Estadística y Economía Española de la Universidad de Barcelona*.
- Vayá, E., López-Bazo, E. y Artís, M. (1998) "Growth, convergence and (why not?) regional externalities", WP E98/31 División II Universidad de Barcelona.
- Venables, A. (1996) "Equilibrium locations of vertically linked industries", *International Economic Review*, 37, 341-359.

- Ventura, E. (1990) "L'eficàcia de la inversió pública com a promotora del desenvolupament regional", *Instituto de Análisis Económico*, DT-A14.
- Velázquez, F.J. (1993) "Economías de escala y tamaños óptimos en la industria española (1980-1986)", *Investigaciones Económicas*, XVII(3), 507-525.
- Vickerman, R.W. (1987) "The Channel Tunnel and regional development. A critique of an infrastructure growth project". *Project Appraisal*, vol. 3. Not. Kent. .
- Vickerman, R.W. (Ed.) (1991) *Infrastructure and regional development*. Pion, London.
- Vickery, W.S. (1963) "Pricing in urban and suburban transport", *American Economic Review*, 53(2), 452-465.
- Wallace, T.D. y Hussain, A. (1969) "The use of error components models in combining cross-section and time-series data", *Econometrica*, 37, 55-72.
- Weber, A. (1909) *Über den Standort der Industrien*, Part I. Tübingen.
- Wheat, L.F. (1969) "The effect of modern highways on urban manufacturing growth", *Highway Research Board*, 277, 9-24.
- Wheeler, D. y Mody, A. (1992) "International investment location decisions: The case of U.S. Firms", *Journal of International Economics*, 33, 57-76.
- White, E.N. y Hewings, G.J.D. (1982) "Space-Time employment modeling: Some results using seemingly unrelated regression estimators", *Journal of Regional Science*, 22(3), 283-302.
- Whittle, P. (1954) "On stationary processes in the plane", *Biometrika*, 41, 434-449.
- Winston, C. M. (1990) "How efficient is current infrastructure spending and pricing?" en *Is there a shortfall in public capital investment?*, Boston: Federal Reserve Bank of Boston.
- Young, A. (1928) "Increasing returns and economic progress", *Economic Journal*, 38, 357-392.
- Young, A. (1991) "Learning by doing and the dynamic effects of international trade", *Quarterly Journal of Economics*, May, 369-406.
- Zabalza, A. (1988) "La inversión pública: evolución y perspectivas", *Papeles de Economía Española*, 37, 332-354.
- Zellner, A. (1962): "An efficient method for estimating seemingly unrelated regressions and tests for aggregation bias", *Journal of the American Statistical Association*, 57, 585-612.
- Zoltan, A. y Audretsch, D.B. (1988) "Innovation in large and small firms: An empirical analysis", *American Economic Review*, 78(4), 678-690.