

UNIVERSIDADE FEDERAL DE JUIZ DE FORA
FACULDADE DE ECONOMIA
PROGRAMA DE PÓS-GRADUAÇÃO EM ECONOMIA (PPGE)
DISCIPLINA: **ECONOMIA DA TECNOLOGIA**
PERÍODO: 3º trimestre de 2022
PROFESSOR: EDUARDO GONÇALVES

Ementa: Este curso aborda aspectos conceituais e impactos da mudança tecnológica, com ênfase nos determinantes da atividade tecnológica e nas causas e efeitos dos mecanismos de difusão do conhecimento tecnológico em firmas, setores e regiões.

1. ASPECTOS CONCEITUAIS, DE MEDIÇÃO E IMPACTOS DA MUDANÇA TECNOLÓGICA

- COHEN, W. Empirical studies of innovative activity. In: STONEMAN, P. (Ed.) **Handbook of the economics of innovation and technological change**. Oxford: Basil Blackwell, p. 182-264, 1995.
- DOSI, G. Sources, procedures and microeconomic effects of innovation. **Journal of Economic Literature**, v. 27, pp. 1126-1171, 1988.
- FREEMAN, C., SOETE, L. **The economics of industrial innovation**. London: Pinter, 1997.
- GRILICHES, Z. (1990). Patent statistics as economic indicators: a survey. **Journal of Economic Literature**, v. 28, n. 4, p. 1661-1707.
- HALL, B. H. Innovation and diffusion. In: FAGERBERG, J., MOWERY, D. C., NELSON, R. R. (Eds.), **The Oxford Handbook of Innovation**, New York: Oxford University Press, 2005. (Cap. 17)
- KUZNETS, S. Inventive activity: problems of definition and measurement. In: NELSON, R. (Ed.), **The rate and direction of inventive activity: economic and social factors**. Princeton: Princeton University, p. 19-51, 1962.
- LUCAS, R. E. On the mechanics of economic development. **Journal of Monetary Economics**, v. 22, p. 3-42, 1988.
- NAGAOKA, S.; MOTOHASHI, K.; GOTO, A. Patent Statistics as an Innovation Indicator. In: Hall; B. H.; Rosenberg, N. (eds.) **Handbook of Economics of Innovation**. Elsevier, 2010, cap. 25.
- NELSON, R., WINTER, S. G. **An evolutionary theory of economic change**. Cambridge: Harvard University, 437p., 1982
- PATEL, P.; PAVITT, K. (1995) Patterns of technological activity: their measurement and interpretation. In: STONEMAN, P. (ed.) **Handbook of the Economics of Innovation and Technological Change**. Oxford: Blackwell.
- PAVITT, K. Sectoral patterns of technical change. **Research Policy**, n. 13, p. 343-373, v. 13, n.6, 1984.
- ROMER, P. M. Increasing returns and long-run growth. **Journal of Political Economy**, v. 94, n. 5, p. 1002-1037, 1986.
- ROSENBERG, N. **Inside the black box: technology and economics**. Cambridge: Cambridge University Press, 1982.
- ROSENBERG, N. **Perspectives on technology**. Cambridge: Cambridge University Press, 1976.
- SCHUMPETER, J. **A teoria do desenvolvimento econômico**. São Paulo: Nova Cultural, 1985.

- SCHUMPETER, J. **Capitalismo, socialismo e democracia**. Rio de Janeiro: Zahar Editores, 1984.
- SMITH, K. Measuring Innovation. In: FAGERBERG, J., MOWERY, D. C., NELSON, R. R. (Eds.), **The Oxford Handbook of Innovation**, New York: Oxford University Press, 2005.
- STRUMSKY, D.; LOBO, J.; LEEUW, S. van der. Using patent technology codes to study technological change. **Economics of Innovation and New technology**, v. 21, n. 3, p. 267-286, 2012.
- VAN ZEEBROECK, N., LA POTTERIE, B. V. P. The vulnerability of patent value determinants. **Economics of Innovation and New technology**, v. 20, n. 3, p. 283-308, 2011.
- VAN ZEEBROECK, N., LA POTTERIE, B. V. P. The puzzle of patent value indicators. **Economics of Innovation and New technology**, v. 20, n. 1-2, p. 33-62, 2011.

2. ASPECTOS CONCEITUAIS E MEDIÇÃO DOS TRANSBORDAMENTOS DE CONHECIMENTO TECNOLÓGICO

- ARROW, K. J. (1962) Economic welfare and the allocation of resources for invention. In: LAMBERTON, D. M. (Org.), **Economics of information and knowledge**. Harmondsworth, Middlesex: Penguin Books Ltd., 1971.
- AUDRETSCH, D. B., KEILBACH, M. The mobility of economic agents as conduits of knowledge spillovers. In: FORNAHL, D., ZELLNER, C., AUDRETSCH, D. B. (Eds.), **The role of labour mobility and informal networks for knowledge transfer**. New York: Springer, p. 8-25, 2005.
- BRESCHI, S., LISSONI, F. Knowledge spillovers and local innovation systems: a critical survey. **Industrial and Corporate Change**, v. 10, n. 4, p. 975-1004, 2001.
- BRESCHI, S. The geography of knowledge flows. In: COOKE, P., ASHEIM, B., BOSCHMA, R., MARTIN, R., SCHWARTZ, D., TÖDTLING, F. (Eds.), **Handbook of regional innovation and growth**. Cheltenham/Northampton: Edward Elgar, 2011, p. 132-142.
- COE, D. T., HELPMAN, E., HOFFMAISTER, A.W. North-south R&D spillovers. **The Economic Journal**, v. 107, p. 134-149, 1997.
- COHEN, W.; LEVINTHAL, D. Innovation and learning: the two faces of R&D. **The Economic Journal**, v. 99, n. 397, p. 569-596, 1989.
- FORAY, D. **The economics of knowledge**. Cambridge/Londres: MIT Press, 2006.
- GEROSKI, P. A. 'Do spillovers undermine the incentive to innovate?,' in S. Dowrick (ed.), **Economic Approaches to Innovation**. Edward Elgar: Aldershot, UK, pp. 76-97, 1995.
- GRILICHES, Z. (R&D and productivity: econometric results and measurement issues. In: STONEMAN, P. (Ed.) **Handbook of the economics of innovation and technological change**. Oxford: Basil Blackwell, p. 52-89, 1995.
- GRILICHES, Z. The search for R&D spillovers. **Scandinavian Journal of Economics**, v. 94, p. 29-47, 1992.
- HALL, B. H.; MAIRESSE, J.; MOHNEN, P. Measuring the Returns to R&D. In: HALL; B. H.; ROSENBERG, N. (eds.) **Handbook of Economics of Innovation**. Elsevier, 2010, cap. 24.
- HENDERSON, V. J. Understanding knowledge spillovers. **Regional Science and Urban Economics**, v. 37, p. 497-508, 2007.

- JOHANSSON, B., KARLSSON, C. Knowledge and regional development. In: CAPELLO, R.; NIJKAMP, P. (Eds.). **Handbook of Regional Growth and Development Theories**. Cheltenham: Edward Elgar, 2009, p. 239-255.
- MALECKI, E. J. Everywhere? The geography of knowledge. **Journal of Regional Science**, v. 50, n. 1, p. 493-513, 2010.
- NELSON, A. J. Measuring knowledge spillovers: what patents, licenses and publications reveal about innovation diffusion. **Research Policy**, v. 38, p. 994-1005, 2009.
- POLANYI, M. **The tacit dimension**. Londres: Routledge and Kegan Paul, 1967.
- SCITOVSKY, T. Two concepts of external economies. In: AGARWALA, A. N., SINGH, S. P., **The economics of underdevelopment**. New York: Oxford University Press, 1963.
- STEWART, F., GHANI, E. How significant are externalities for development? **World Development**, v. 19, n. 6, p. 569-594, 1991.

3. TRANSBORDAMENTOS SETORIAIS DE CONHECIMENTO TECNOLÓGICO

- COE, D. T., HELPMAN, E. International R&D spillovers. **European Economic Review**, v. 39, p. 859-887, 1995.
- CRESPI, G., D'ESTE, P., FONTANA, R., GEUNA, A. The impact of academic patenting on university research and its transfer. **Research Policy**, v. 40, p. 55-68, 2011.
- CERULLI, G., POTI, B. Measuring intersectoral knowledge spillovers: an application of sensitivity analysis to Italy, **Economic Systems Research**, v. 21, n. 4, p. 409-436, 2009.
- DE LA POTTERIE, B. V. P. Issues in assessing the effect of interindustry R&D spillovers. **Economic Systems Research**, v. 9, n. 4, p. 331-356, 1997.
- FALVEY, R., FOSTER, N., GREENAWAY, D. Relative backwardness, absorptive capacity and knowledge spillovers. **Economics Letters**, v. 97, p. 230-234, 2007.
- FORAY, D., LISSONI, F. University research and public-private interaction. In: HALL, B. H., ROSENBERG, N. (Eds.), **Handbook of the Economics of Innovation**. Amsterdam: Elsevier, 2010.
- FUNK, M. Patent sharing by US universities: an examination of university joint patenting. **Economics of Innovation and New technology**, v. 22, n. 4, p. 373-391, 2013.
- GEHRINGER, A. Pecuniary knowledge externalities and innovation: intersectoral linkages and their effects beyond technological spillovers. **Economics of Innovation and New Technology**, v. 20, n. 5, p. 495-515, 2011.
- GURMU, S., GRANT, C. B., STEPHAN, P. E. The knowledge production function for university patenting. **Economic Inquiry**, v. 48, n. 1, p. 192-213, 2010.
- GRILICHES, Z. Issues in Assessing the Contribution of Research and Development to Productivity Growth, **The Bell Journal of Economics**, v. 10, n 1, p. 92-116, 1979.
- HANEL, P. R&D, interindustry and international technology spillovers and the total factor productivity growth of manufacturing industries in Canada, 1974-1989. **Economic Systems Research**, v. 12, n. 3, p. 345-361, 2000.
- HAUKNES, J. KNELL, M. Embodied knowledge and sectoral linkages: an input-output approach to the interaction of high- and low-tech industries. **Research Policy**, v. 38, p. 459-469, 2009.

- JAFFE, A. B. Technological opportunity and spillovers of R&D: evidence from firms' patents, profits, and market value. **The American Economic Review**, v. 76, n. 5, 984-1001, 1986.
- KELLER, W. Are international R&D spillovers trade-related? Analysing spillovers among randomly matched trade partners. **European Economic Review**, v. 42, p. 1469-1481, 1998.
- KELLER, W. International trade, foreign direct investment, and technology spillovers. In: HALL, B. H., ROSENBERG, N. (Eds.), **Handbook of the Economics of Innovation**. Amsterdam: Elsevier, 2010.
- LAFORGIA, F., LISSONI, F. What do you mean by "mobile"? multi-applicant inventors in the European biotechnology industry. In: MALERBA, F., VONORTAS, N. (Eds.), **Innovation networks in industries**. Cheltenham/Northampton: Edward Elgar, 2009.
- LENZI, C. Workers' mobility and patterns of knowledge diffusion: evidence from Italian data. **Journal of Technology Transfer**, v. 35, p. 651-670, 2010.
- MACDISSI, C., NEGASSI, N. International R&D spillovers: an empirical study. **Economics of Innovation and New Technology**, v. 11, n. 2, p. 77-91, 2002
- MAGNANI, E. Is workers' mobility a source of R&D spillovers? Evidence of effects of innovative activities on wages. **International Journal of Manpower**, v. 27, n. 2, p. 169-188, 2006.
- MARILANTA, M., MOHNEN, P., ROUVINEN, P. Is inter-firm labor mobility a channel of knowledge spillovers? Evidence from a linked employer-employee panel. **Industrial and Corporate Change**, v. 18, n 6, p. 1161-1191, 2009.
- MOEN, J. Is mobility of technical personnel a source of R&D spillovers? **Journal of Labor Economics**, v. 23, n. 1, p. 81-114, 2005.
- RIBEIRO, E. C. B. A., GONÇALVES, Eduardo, FREGUGLIA, R. S. Transbordamentos de conhecimento e capacidade de absorção: uma análise para os estados brasileiros. **Economia** (Brasília), v. 14, p. 3-27, 2013.
- SONG, J., ALMEIDA, P., WU, G. Learning-by-hiring: when is mobility more likely to facilitate interfirm knowledge transfer? **Management Science**, v. 49, n. 4, p. 351-365, 2003.
- VAN MEIJL, H. Measuring intersectoral spillovers in France. **Economic Systems Research**, v. 9, n. 1, p. 25-46, 1997.
- VUORI, S. Interindustry Technology Flows and Productivity in Finnish Manufacturing. **Economic Systems Research**, v. 9, n.1, p. 67-80, 1997.
- WOLFF, E. N. Spillovers, Linkages and Technical Change. **Economic Systems Research**, v. 9, n.1, p.9-23, 2007.

4. ASPECTOS REGIONAIS DA INOVAÇÃO E TRANSBORDAMENTOS REGIONAIS DE CONHECIMENTO TECNOLÓGICO

- ACS, Z. J., ANSELIN, L., VARGA, A. Patents and innovation counts as measures of regional production of new knowledge. **Research Policy**, v. 31, p. 1069-1085, 2002.
- ALDIERI, L. Technological and geographical proximity effects on knowledge spillovers: evidence from the US patent citations. **Economics of Innovation and New Technology**, v. 20, n. 6, p. 597-607, 2011.
- ALMEIDA, P., KOGUT, B. Localization of knowledge and the mobility of engineers in regional networks. **Management Science**, v. 45, n. 7, 1999.

- ANDERSSON, R., QUIGLEY, J. M., WILHELMSSON, M. Urbanization, productivity, and innovation: evidence from investment in higher education. **Journal of Urban Economics**, v. 66, p. 2-15, 2009.
- AUDRETSCH, D. B. Agglomeration and the location of innovative activity. **Oxford Review of Economic Policy**, v. 14, n. 2, p. 18-29, 1998.
- AUDRETSCH, D. B., STEPHAN, P. E. Company-scientist locational links: the case of biotechnology. **The American Economic Review**, v. 86, n. 3, p. 641-652, 1996.
- AUDRETSCH D. B., FELDMAN M. P. R&D spillovers and the geography of innovation and production. **American Economic Review**, v. 86, p. 630-640, 1996.
- AUDRETSCH, D. B., FELDMAN, M. P. Knowledge spillovers and the geography of innovation. In: HENDERSON, J. V., THISSE, J., (Eds.), **Handbook of regional and urban economics**, v. 4, 2004, p. 2713-2739.
- AUTANT-BERNARD, C. The geography of knowledge spillovers and technological proximity. **Economics of Innovation and New Technology**, v. 10, p. 237-254, 2001.
- BEAUDRY, C.; SCHIFFAUEROVA, A. Who's right, Marshall or Jacobs? The localization versus urbanization debate. **Research Policy**, v. 38, p. 318-337, 2009.
- BODE, E. The spatial pattern of localized R&D spillovers: an empirical investigation for Germany. **Journal of Economic Geography**, v. 4, p. 43-64, 2004.
- BRESCHI, S. The geography of innovation: a cross-sector analysis. **Regional Studies**, v. 34, n. 3, p. 213-229, 2000.
- BRESCHI, S., LENZI, C. Spatial patterns of inventors' mobility: evidence on US urban areas. **Papers in Regional Science**, v. 89, n. 2, 2010.
- BRESCHI, S., LISSONI, F. Localised knowledge spillovers vs. innovative milieu: knowledge "tacitness" reconsidered. **Papers in Regional Science**, v. 80, p. 255-273, 2001.
- BROEKEL, T., BRENNER, T. Regional factors and innovativeness: an empirical analysis of four German industries. **The Annals of Regional Science**, v. 47, n.1, p. 169-194, 2011.
- BUESA, M.; HEIJS, J.; BAUMERT, T. The determinants of regional innovation in Europe: A combined factorial and regression knowledge production function approach. **Research Policy**, v. 39, p. 722-735, 2010.
- CABRER-BORRÁS, B., SERRANO-DOMINGO, G. Innovation and R&D spillover effects in Spanish regions: a spatial approach. **Research Policy**, v. 36, p. 1357-1371, 2007.
- CAPELLO, R. Innovation and productivity: local competitiveness and the role of space. In: COOKE, P., ASHEIM, B., BOSCHMA, R., MARTIN, R., SCHWARTZ, D., TÖDTLING, F. (Eds.), **Handbook of regional innovation and growth**. Cheltenham/Northampton: Edward Elgar, 2011, p. 107-118.
- CARAGLIU, A.; DEL BO, C. Determinants of spatial knowledge spillovers in Italian provinces. **Socio-Economic Planning Sciences**, v. 45 p. 28-37, 2011.
- CARLINO, G. A., CHATTERJEE, S. HUNT R. M. Urban density and the rate of invention. **Journal of Urban Economics**, v. 61, p. 389-419, 2007.
- CEH, B. Regional innovation potential in the United States: evidence of spatial transformation. **Papers in Regional Science**, v. 80, p. 297-316, 2001.
- DENTI, D. R&D spillovers and regional growth. In: CAPELLO, R.; NIJKAMP, P. (Eds.). **Handbook of Regional Growth and Development Theories**. Cheltenham: Edward Elgar, 2009, p. 211-238.
- DÖRING, T., SCHNELLENBACH, J. What do we know about geographical knowledge spillovers and regional growth? A survey of the literature. **Regional Studies**, v. 40, n. 3, p. 375-395, 2006.

- FAGGIAN, A., MCCANN, P. Human capital, graduate migration and innovation in British regions. **Cambridge Journal of Economics**, v. 33, p. 317-333, 2009.
- FELDMAN, M. P.; KOGLER, D. F. Stylized facts in the geography of innovation. In: Hall; B. H.; Rosenberg, N. (eds.) **Handbook of Economics of Innovation**. Elsevier, 2010, cap. 8.
- FELDMAN, M. P. The new economics of innovation, spillovers and agglomeration: a review of empirical studies. **Economics of Innovation and New Technology**, v. 8, n. 1/2, p. 5-25, 1999.
- FELDMAN M. P., AUDRETSCH D. B. Innovation in cities: science-based diversity, specialization and localized competition, **European Economic Review**, v. 43, p. 409-429, 1999.
- FELDMAN, M. P., FLORIDA, R. The geographic sources of innovation: technological infrastructure and product innovation in the United States. **Annals of the Association of American Geographers**, v. 84, n. 2, p. 210-229, 1994.
- FELSENSTEIN, D. Human capital and labour mobility determinants of regional innovation. In: COOKE, P., ASHEIM, B., BOSCHMA, R., MARTIN, R., SCHWARTZ, D., TÖDTLING, F. (Eds.), **Handbook of regional innovation and growth**. Cheltenham/Northampton: Edward Elgar, 2011, p. 119-131.
- FISCHER, M. M., VARGA, A. Spatial knowledge spillovers and university research: evidence from Austria. **The Annals of Regional Science**, v. 37, p. 303-322, 2003.
- GALILIÉ, E. Is geographical proximity necessary for knowledge spillovers within a cooperative technological network? The case of the French biotechnology sector. **Regional Studies**, v. 43.1, p. 33-42, 2009.
- GLAESER E. L., KALLAL H. D., SCHEINKMAN J. A., SHLEIFER, A. Growth in cities. **Journal of Political Economy**, v. 100, p. 1126-1152, 1992.
- GONÇALVES, E.; ALMEIDA, E. S. Innovation and Spatial Knowledge Spillovers: Evidence from Brazilian Patent Data. **Regional Studies**, v. 43. n.4, p. 513-528, 2009.
- GONÇALVES, E., LEMOS, M. B., DE NEGRI, J. A. The role of firm and territory in innovative activities in Brazilian post-opening economy. **Economia Aplicada** (Impresso), v. 15, p. 103-130, 2011.
- GREUNZ, L. Geographically and technologically mediated knowledge spillovers between European regions. **The Annals of Regional Science**, v. 37, p. 657-680, 2003.
- HIGGS, R. American inventiveness, 1870-1920. **The Journal of Political Economy**, v. 79, n. 3, p. 661-667, 1971.
- IAMMARINO, S. Regional innovation and diversity. In: COOKE, P., ASHEIM, B., BOSCHMA, R., MARTIN, R., SCHWARTZ, D., TÖDTLING, F. (Eds.), **Handbook of regional innovation and growth**. Cheltenham/Northampton: Edward Elgar, 2011, p. 143-154.
- JACOBS, J. **The economy of cities**. Nova York: Random House, 268p., 1969.
- JAFFE, A. B. Real effects of academic research. **The American Economic Review**, v. 79, n. 5, p. 957-970, 1989.
- JAFFE, A., TRAJTENBERG, M., HENDERSON, R. Geographic localization of knowledge spillovers as evidenced by patent citations. **The Quarterly Journal of Economics**, v. 108, n. 3, p. 577-598, 1993.
- LIM, U. Knowledge externalities, spatial dependence, and metropolitan economic growth in the United States. **Environment and Planning A**, v. 39, p. 771-788, 2007.

- MALISZEWSKI, P. J., O´HUALLACHÁIN, B. Hierarchy and concentration in the American urban system of technological advance. **Papers of Regional Science**, v. 91, n. 4, p. 7343-758, 2012
- MARSHALL, A. **Princípios de economia**. São Paulo: Abril Cultural, 1982.
- MCCANN, P., SIMONSEN, J. Innovation, knowledge spillovers and local labour markets. **Papers in Regional Science**, v 84, n. 3, p. 465-485, 2005.
- MIGUÉLEZ, E.; MORENO, R. Skilled labour mobility, networks and knowledge creation in regions: a panel data approach. **The Annals of Regional Science**, v.69,p. 1-22, 2012.
- MONTENEGRO, R. L. G., GONÇALVES, E., ALMEIDA, E. S. Dinâmica espacial e temporal da inovação no Estado de São Paulo: uma análise das externalidades de diversificação e especialização. **Estudos Econômicos**, v. 41, p. 1-34, 2011.
- MORENO, R., PACI, R., USAI, S. Spatial spillovers and innovation activity in European regions. **Environment and Planning A**, v. 37, p. 1793-1812, 2005.
- MORENO, R., PACI, R., USAI, S. Geographical and sectoral clusters of innovation in Europe. **Annals of Regional Science**, v. 39, p. 715-739, 2005.
- MORETTI, E. Local labor markets. In: ASHENFELTER, O., CARD, D. (Eds.), **Handbook of labor economics**. Amsterdam/San Diego: North Holland, Elsevier, 2011.
- MUKIM, M. Does agglomeration boost innovation? An econometric evaluation. **Spatial Economic Analysis**, v. 7, n. 3, 2012.
- O´HUALLACHÁIN, B. Patent places: size matters. **Journal of Regional Science**, v. 39, n. 4, p. 613-636, 1999.
- O´HUALLACHÁIN, B., LESLIE, T. F. Spatial Convergence and Spillovers in American Invention. **Annals of the Association of American Geographers**, v. 95, n. 4, p. 866-886, 2005.
- O´HUALLACHÁIN, B., LESLIE, T. F. Rethinking the regional knowledge production function. **Journal of Economic Geography**, v. 7, p. 737-752, 2007.
- O´HUALLACHÁIN, B., LEE, D. Technological specialization and variety in urban invention. **Regional Studies**, v. 45, n. 1, p. 67-88, 2011.
- SHEARMUR, R. Are cities the font of innovation? A critical review of the literature on cities and innovation. **Cities**, v. 29, p. s9-s18, 2012.
- STERNBERG, R., ARNDT, O. The firm or the region: what determines the innovation behavior of European firms? **Economic Geography**, v. 77, n. 4, p. 364-382, 2001.
- THOMPSON, W. R. Locational differences in inventive effort and their determinants. In: NELSON, R. (Ed.), **The rate and direction of inventive activity: economic and social factors**. Princeton: Princeton University, p. 19-51, 1962.
- TORRE, A. On the role played by temporary geographical proximity in knowledge transmission. **Regional Studies**, v. 42, n. 6, p. 869-889, 2008.
- USAI, S. The Geography of Inventive Activity in OECD Regions. **Regional Studies**. v. 45, n. 6, 2011.
- VEGA-JURADO, J., GUTIÉRREZ-GRACIA, A., FERNÁNDEZ-DE-LUCIO, I., MANJARRÉS-HENRÍQUEZ, L. The effect of external and internal factors on firms' product innovation. **Research Policy**, v. 37, p. 616-632, 2008.
- ZUCKER, L. G., DARBY, M. R., ARMSTRONG, J. Geographically localized knowledge: spillovers or markets? **Economic Inquiry**, v. 36, p. 65-86, 1998.