Beyond Innovation Districts: The Case of Medellinnovation District

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Abstract. Innovation districts are emerging as local economic development strategies in diverse cities around the world. They have however, been criticized for being non-participative top-down initiatives that encourage gentrification and economic polarization. Ruta N, a public organization, is leading the transformation of the innovation district of Medellin (Colombia), dubbed as Medellinnovation District. The paper investigates the programs that are being implemented in the Medellinnovation District in order to mitigate the negative externalities that such strategy can generate. The research methodology is based on a case study approach, using Medellinnovation District as a significant and high-impact case. The paper finds that the programs that Ruta N is implementing can be regrouped into two categories: attraction and absorption. The programs under attraction aim to attract knowledge companies and workers to the innovation district. The programs under absorption aim to activate the absorptive capacity of the residents living in the innovation district in order to make them full participants of the development of the innovation district.

Keywords: Innovation district · Medellin · Creative city · Public policy
Social inclusion · Innovation culture

1 Introduction

Innovation districts are being adopted in cities around the world as local economic development strategies. Barcelona (Spain), Boston (Massachusetts), Chattanooga (Tennessee), Detroit (Michigan), Medellin (Colombia), Montréal (Canada), Philadelphia (Pennsylvania), Rotterdam (the Netherlands), and San Diego (California) are some of the cities that are building their own version of an innovation district. The main objective of innovation districts is to accelerate the technological innovation process by clustering knowledge companies and workers [1, 2].

In 2009, the city of Medellin and the public-utility and telecommunications company EPM-UNE, launched the nonprofit organization Ruta N Medellin [3]. The organization has the mission to support companies, public institutions, and universities to foster technological innovations while at the same time transforming Medellin into a knowledge city [3]. In 2012, Ruta N unveiled its plan to create an innovation district around the Ruta N innovation center [4]. The innovation district of Medellin aims to redevelop 172 hectares of the northern part of the city [5]. Innovation districts and the innovation economy are criticized for contributing to gentrification and economic

polarization [6–9]. The development of innovation districts is also criticized for being non-participative and undemocratic where local governments are pushing a neoliberal agenda favoring the middle- and upper-class [10–12].

The paper investigates the programs that Ruta N implemented in order to mitigate the negative externalities of building its own version of an innovation district, the Medellinnovation District. The innovation district of Medellin is selected as a single significant and high-impact case study. The research conducted for this paper is based on three sources of data: semi-structured interviews, secondary data, and direct observation. The paper is highly relevant for urban policymakers who wish to mitigate the negative externalities from the creation of an innovation district in their cities. The paper finds that the programs that Ruta N is implementing can be regrouped into two categories: attraction and absorption. The programs under attraction aim to attract knowledge companies and workers to the innovation district. The programs under absorption aim to activate the absorptive capacity of the residents living in the innovation district in order to make them full participants of the development of the innovation district.

2   Innovation Districts, Gentrification, and Polarization

In the 1990s, capitalist countries started to undergo an economic transition towards post-Fordism or knowledge-based economies [13, 14]. In the knowledge economy, technological innovation is a precondition for high-standard of living and economic prosperity [15]. The academic literature provides, both across nations and over time, a solid theoretical background linking technological innovation to the progress of countries, regions, cities, and firms [16–21].

The OECD [22] argues that "innovation provides the foundation for new businesses, new jobs and productivity growth and is thus an important driver of economic growth and development" (p. 13). Technological innovation drives productivity growth as well as the quality and quantity of jobs, which are critical to improve standards of living [23]. Indeed, technological innovation is considered as a major force in economic growth and in a post-2008 era characterized by low economic growth, innovation is seen as a transformative force for developed and developing economies [22, 24].

The concept of an innovation district emerges in order for cities to harness the transformative power of technological innovations and to become knowledge cities. Cities are increasingly seen as the key administrative units to spur technological innovations [25, 26]. The concept of an innovation district is the policy-response to the increasingly spatial and urban dimensions of the knowledge-based economy, combining innovation theories with socio-economic trends that have emerged in the knowledge-based economy [2].

Innovation districts are criticized for being no less than gentrification programs [10, 11, 27]. Gentrification is a process that involves "the transition of inner-city neighborhoods from a status of relative poverty and limited property investment to a state of commodification and reinvestment" [28]. In gentrified neighborhoods, the population structure changes from being working-class to upper-middle-class and most often from being black to white [7, 29, 30]. In the United States in the 1980s, local and regional

governments stepped out from implementing urban renewal programs, which led gentrification to strictly be the outcome of market forces [30]. In the United States, most innovation districts are pushed by real-estate development companies and as a result, lack some conceptual dimensions in order to be fully functioning innovation districts [2].

The innovation economy is criticized for polarizing the workforce and hollowing out the middle class [31–33]. Technological innovations are concentrated in large urban centers, which favors the emergence of "superstar cities" [6, 34–37]. Superstar cities concentrate economic wealth and are also highly unequal cities [8, 38]. In superstar cities, the middle- and upper-middle-class are being priced out due to rising rents and costs of living [39]. Superstar cities are thus becoming cities that only multi-millionaires and billionaires can afford to live in [7]. The innovation economy has fostered such economic polarization in some cities, like in San Francisco, that it has led to demonstrations against knowledge companies and knowledge workers [40].

3   Methodology

The research methodology is based on a single case-study approach, using primary and secondary data. The authors use the case study approach "out of the desire to understand complex social phenomena" [41]. The purpose of this case study is to uncover the programs that can be implemented to mitigate the creation of an innovation district. The case selected is the innovation district of Medellin that is being developed by the public organization, Ruta N Medellin. The paper investigates in a descriptive manner a contemporary phenomenon in which the researcher has no control on the actual phenomenon [42]. Moreover, the investigation of programs to mitigate the negative externalities of innovation districts has not been fully examined. A qualitative approach is as a result, the most appropriate method [42, 43].

The research conducted for this paper is based on three sources of data: semi-structured interviews, secondary data, and direct observation. The semi-structured interviews were conducted in Medellin with key informants who have extensive knowledge on the programs implemented by Ruta N Medellin. In total, eleven interviews were conducted. The persons interviewed were: employees at Ruta N Medellin, professors at EAFIT University and MIT, and employees at the Agency for Cooperation and Investment of Medellin and the Metropolitan Area (ACI). The stakeholders were selected according to their strong knowledge and diverse perspectives on the phenomena studied [44]. The interviews were conducted in order to uncover the strategies adopted to create an inclusive innovation district in Medellin. The secondary data that were used for the research are, but were not limited to: Ruta N's websites; Ruta N's planning documents; articles in news websites, newspapers, and magazines, such as *El Colombiano*, *El Tiempo*, and *Semana*; and Ruta N's annual reports. The direct observations involved non-participatory observations in the innovation district of Medellin. In total, the researcher conducted about 20 h of formal and informal observations in order to investigate the contacts between the newly arrived knowledge workers and the district's residents.

The case study aims to provide rich and deep understanding of the programs behind building inclusive innovation districts, and, as such, is a significant and high-impact case. The data are analyzed in an inductive manner in order to uncover patterns in the programs implemented [45]. From the pattern recognition, the authors decided to categorize the programs adopted into two groups: attraction and absorption. Validation is achieved through prolonged engagement, persistent observation, and triangulation in order to "assure that the right information and interpretations have been obtained" [46]. The rich description allows readers to make decisions regarding transferability [45].

4   Case Study - The Medellinnovation District

4.1   The Context

The City of Medellin is located in the Aburrá Valley in midst of the Andes in Colombia. Medellin is the second most populous city in Colombia with a population of 2,464,322 inhabitants as of 2015, after the capital city Bogotá [47]. The city of Medellin was the industrial capital in the 1970s of Colombia and one of the most important industrial powerhouses in Latin America [48]. In 1991, the city of Medellin became infamous for being the murder capital of the world during the heyday of the Medellin cartel [49]. In 2013, the Wall Street Journal and Citi announced Medellin to be the "most innovative city of the year" recognizing the city's social urbanism programs and innovative transportation system connecting the poorest neighborhoods with the city center [50].

In 2009, the city of Medellin and the public-utility and telecommunications company EPM-UNE launched Ruta N Medellin, a public organization that has the mission to transform the Medellin into a knowledge city [3]. In 2012, Ruta N unveiled its plan to create an innovation district in the northern part of the city [4]. The innovation district, dubbed as Medellinnovation District, aims to redevelop an area of 172 hectares with a population of 12,244 inhabitants as of 2015, comprising the districts of Chagualo, Jesús Nazareno, Sevilla, and San Pedro [5]. The innovation district is to be planned around Ruta N innovation center, a 33,140-square-meter three-building complex that houses Ruta N offices, EPM-UNE research laboratories, the ViveLab animation learning center, international companies, and international startups. The northern part of the city was selected due to its existing infrastructures, such as the University of Antioquia, the National University, the Hospital San Vicente de Paul, the Parque Explora, and the Botanical Garden of Medellin, two metro stations, the Ruta N innovation center, and the close proximity to the city center. Most importantly, the northern part of the city of Medellin has historically been an impoverished area, concentrating most of the city's poverty.

4.2   The Programs

In 2012, Ruta N established the innovation district division, which has the mission to supervise and to promote the development of the Medellinnovation District [4]. In 2012, experts from 22@ Barcelona, the first innovation district to have been planned by

policymakers, came to Medellin as consultants to help structure the strategy of the Medellinnovation District. In 2013, urban planning professors from MIT, including Dennis Frenchman and Carlo Ratti, designed the masterplan for the Medellinnovation District. The following programs are current or former programs that were implemented by the Ruta N's innovation district division between 2012 and August 2017.

The soft landing program was established in 2012 in order to attract knowledge-intensive international startups to the Ruta N innovation center. In the Ruta N innovation center, there are three floors dedicated to the landing platforms comprising 660 workstations. The landing program aims to connect arriving international startups to the wider innovation ecosystem. Ruta N prioritizes international startups from three sectors, namely, ICT, health, and energy. International startups can rent a flexible number of workstations for a period of up to two years at a competitive price. After the period of two years, the knowledge-intensive startups can then rent spaces through Space N with Ruta N's partners in other parts of the city. From 2012 to 2017, the number of international companies participating in the landing programs increased from seven to more than 90. In total, since the inception of the landing program, 197 companies from 27 countries landed, generating more than 4,216 jobs. The landing program is managed by Ruta N innovation district team and the ACI. In 2014, Ruta N and the ACI visited 7 countries to promote Medellin as a hub for innovation and the landing program [51]. The city of Medellin grants, through the Agreement 67 of 2010, tax breaks such as the property taxes and industry and commerce taxes for companies of the following clusters that locate in the Medellinnovation District: ICT, energy, health, textile, construction, design, and tourism [4]. The tax breaks scheme aims to attract companies to the Medellinnovation District. MIT's and 22@ Barcelona's experts were involved in designing the innovation district's masterplan. The objective of the masterplan is to make the innovation district, an inclusive, sustainable, mixed-use, green, dense, compact, open, and walkable neighborhood. The overall strategy is to make the Medellinnovation District an attractive neighborhood with a high quality of life for the knowledge workers living and working there.

The planning of the Medellinnovation District included co-creation with its residents. Indeed, the Ruta N innovation district's team conducted interviews, observations, focus groups, innovation bazars, creative lunches, census, co-creation activities, and conferences with the inhabitants and associations in the Medellinnovation District. The co-creation process included four phases: approaching the community, co-creating with the community, communicating with the community, and including the community in the development of the innovation district. The DistritoLab program was conducted in 2014 and in 2015 in order to promote science, technology, and innovation to the students living in the Medellinnovation District. DistritoLab is a program that involves the participation of local high school students to find urban solutions and to create innovative prototypes for the innovation district. The students participating in the program learned to use 3D printing machines and laser cutters in order to create working prototypes for the innovation district. Ruta N innovation district's team also organizes events such as the innovation conferences in order to explain the innovation process, intellectual property, and competitive intelligence to the inhabitants of the innovation district. One other event was the innovation bazar where city's innovation institutions presented their conceptions of innovation in an interactive manner with the

inhabitants of the Medellinnovation District. In 2017, Ruta N innovation district's team launched the open kitchen program in order to help existing restaurants and bars to adapt their offerings through capacity-building courses and coaching to the new demand that is generated by the newly arrived knowledge workers employed in the Medellinnovation District. The main objective of the open kitchen program is to make existing restaurants and bars full participants of the development of the innovation district. Similar programs will be organized for auto repair shops and landlords located in the Medellinnovation District. Ruta N innovation district's team is also developing a program to create a Living Lab in order for the local community to be more connected with the knowledge-intensive companies in the Medellinnovation District. The Living Lab will be a platform where local residents can test prototypes and new services.

5   Discussion

The programs developed and implemented by the innovation district division at Ruta N can be regrouped into two categories: attraction and absorption. Attraction refers to the programs that aim to attract companies, startups, and workers to invest, to live, and to work in the Medellinnovation District. Absorption refers to the programs that focus on the residents of the Medellinnovation District in order to make them full participants in the development of the innovation district.

The absorption programs such as DistritoLab, innovation events, Open Kitchen, the Living Lab, and the community co-creation aim to reduce the cognitive distance

Table 1. Summary of Programs with Programs' Key Findings and Goals.

Strategy	Program	Key Finding	Program's Goal
Attraction	Soft Landing	Incentives to attract companies to the district, such as low rent, knowledge spillovers, high amenities	Local economic development
	Tax-Breaks	Incentives to attract companies to the district	Local economic development
	Masterplan	Non-pecunary incentives to attract companies, such as high amenities and quality of life	Urban development
Absorption	Co-Creation	To familiarize local residents with changes brought by knowledge workers and companies	Participatory urbanism
	DistritoLab	To familiarize local residents with technologies used by knowledge workers and companies	Residentes' training
	Open Kitchen	To adapt local businesses to changing customers' preferences in the district	Residentes' business opportunities
	Living Lab	Formal and informal contacts between residents and knowledge-based companies	Residentes' inclusion
	Events	Formal and informal contacts between residents and knowledge-based companies	Residentes' inclusion

between the residents and the newly arrived knowledge workers. Indeed, the absorption programs aim to increase the absorptive capacity of the residents to the external knowledge that the knowledge workers are bringing with them to the Medellinnovation District. Nooteboom [52] shows that knowledge diffusion is constrained by the "cognitive distance" between actors. This cognitive distance should not be too wide nor too similar. Indeed, knowledge that is already known is just as useless as it is for knowledge that cannot be understood [53]. In reducing the cognitive distance between the residents and the incoming knowledge workers, Ruta N innovation district's team aims to build an inclusive innovation district that does not exclude residents from participating in the knowledge economy (Table 1).

6 Conclusions

The strategy adopted in the Medellinnovation District potentially offers a response on how to limit the negative externalities, such as gentrification, non-participation, and segregation, arising from the development of an innovation district. Organizations that implement innovation districts should design programs in order to reduce the cognitive distance, if such cognitive distance exists, between the residents and the incoming knowledge workers. In doing so, residents can become full participants in the development of the innovation district, and even accelerate the innovation process of the incoming companies through recombination of novel and diverse ideas that the residents can convey. The findings can be generalized to other innovation districts that have a large population and where there are concerns of possible gentrification. Although the strategy adopted in the Medellinnovation District is promising on a theoretical standpoint, it is difficult to assess its efficacy in the face of real-estate speculation and land pressures. Indeed, the Medellinnovation District has been slow to develop, and real estate developers have manifested little interest in investing in the district. Further research should look at strategies to mitigate negative externalities in innovation districts that have experienced strong real-estate speculations.

References

1. Katz, B., Wagner, J.: The Rise of Innovation Districts: A New Geography of Innovation in America, Brookings Institution, Washington, (2014)
2. Morisson, A.: Innovation Districts: An Investigation of the Replication of the 22@ Barcelona's Model in Boston, Master Dissertation. FGV-EAESP, São Paulo, (2014)
3. Ruta, N.: Informe de Gestión 2010. http://www.rutanmedellin.org/es/nosotros/ruta-n/informes-de-gestion. Accessed 21 Nov 2017

4. Ruta, N.: Informe de Gestión 2012. http://www.rutanmedellin.org/es/nosotros/ruta-n/informes-de-gestion. Accessed 21 Nov 2017

5. Ruta, N.: Tomo I Diagnóstico Documento Técnico de Soporte: Distrito Medellionnovation. In: Ruta, N. Medellin (2015)

6. Edlund, L., Machado, C., Sviatschi, M.M.: Bright Minds, Big Rent: Gentrification and the Rising Returns to Skill, National Bureau of Economic Research, Cambridge (2015)

7. Florida, R.: The New Urban Crisis: How Our Cities Are Increasing Inequality, Deepening Segregation, and Failing the Middle Class and What We Can Do About It. Basic Books, New York (2017)

8. Glaeser, E.L., Resseger, M., Tobio, K.: Inequality in cities. J. Reg. Sci. **49**(4), 617–646 (2009)

9. Stehlin, J.: The post-industrial "shop floor": emerging forms of gentrification in San Francisco's innovation economy. Antipode **48**(2), 474–493 (2016)

10. Moulaert, F.: Globalization and Integrated Area Development in European Cities. Oxford University Press, Oxford (2000)

11. Swyngedouw, E., Moulaert, F., Rodriguez, A.: Neoliberal urbanization in Europe: large-scale urban development projects and the new urban policy. Antipode **34**(3), 542–577 (2002)

12. Shin, H., Stevens, Q.: how culture and economy meet in South Korea: the politics of cultural economy in culture-led urban regeneration. Int. J. Urban Reg. Res. **37**(5), 1707–1723 (2013)

13. Amin, A.: Post-Fordism: A Reader. Blackwell, Oxford (1994)

14. Drucker, P.F.: The Discipline of Innovation. Harvard Bus. Rev. **76**(6), 149–157 (1998)

15. Aghion, P., Howitt, P.: A Model of Growth through Creative Destruction. National Bureau of Economic Research, Cambridge (1990)

16. OECD: The Knowledge-Based Economy, OECD Publishing, Paris (1996)

17. Fagerberg, J.: International competitiveness. Econ. J. **98**(391), 355–374 (1988)

18. Freeman, C.: Technical innovation, diffusion, and long cycles of economic development. In: Vasko, T. (ed.) The Long-Wave Debate, pp. 295–309. Springer, Berlin Heidelberg (1987)

19. Rosenberg, N.: Innovation and Economic Growth. OECD Publishing, Paris (2004)

20. Schumpeter, J.A.: The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. Transaction Publishers, New Jersey (1934)

21. Solow, R.M.: Technical change and the aggregate production function. Rev. Econ. Stat. **39**, 312–320 (1957)

22. OECD: The Innovation Imperative: Contributing to Productivity, Growth and Well-Being, OECD Publishing, Paris (2015)

23. OECD: Regions and Innovation Policy, OECD Reviews of Regional Innovation, OECD Publishing, Paris (2011)

24. Metcalfe, S., Ramlogan, R.: Innovation Systems and the Competitive Process in Developing Economies. Q. Rev. Econ. Finan. **48**(2), 433–446 (2008)

25. Castells, M.: The Rise of the Network Society. Blackwell Publishers, Oxford (1996)

26. Florida, R., Adler, P., Mellander, C.: The City as Innovation Machine. Reg. Stud. **51**(1), 86–96 (2017)

27. Smith, N.: New globalism, new urbanism: gentrification as global urban strategy. Antipode **34**(3), 427–450 (2002)

28. Ley, D.: Artists, aestheticisation and the field of gentrification. Urban Stud. **40**(12), 2527–2544 (2003)

29. Ehrenhalt, A.: The Great Inversion and the Future of the American City. Knopf, New York (2012)

30. Harvey, D.: Rebel Cities: From the Right to the City to the Urban Revolution. Verso Books, London (2012)

31. Acemoglu, D., Autor, D.: Skills, tasks and technologies: implications for employment and earnings. Handb. Labor Econ. **4**, 1043–1171 (2011)
32. Autor, D., Levy, F., Murnane, R.J.: The skill content of recent technological change: an empirical exploration. Q. J. Econ. **118**(4), 1279–1333 (2003)
33. Goos, M., Manning, A.: Lousy and lovely jobs: the rising polarization of work in Britain. Rev. Econ. Stat. **89**(1), 118–133 (2007)
34. Acs, Z.J., Audretsch, D.B.: Innovation in large and small firms: an empirical analysis. Am. Econ. Rev. **78**(4), 678–690 (1988)
35. Gyourko, J., Mayer, C., Sinai, T.: Superstar Cities. Am. Econ. J. Econ. Policy **5**(4), 167–199 (2013)
36. Jaffe, A.B., Trajtenberg, M., Henderson, R.: Geographic localization of knowledge spillovers as evidenced by patent citations. Q. J. Econ. **108**(3), 577–598 (1993)
37. Rodríguez-Pose, A., Crescenzi, R.: Mountains in a flat world: why proximity still matters for the location of economic activity. Camb. J. Reg. Econ. Soc. **1**(3), 371–388 (2008)
38. Aghion, P., Akcigit, U., Bergeaud, A., Blundell, R., Hémous, D.: Innovation and Top Income Inequality, National Bureau of Economic Research, Cambridge, (2015)
39. Priced Out of Paris. https://www.ft.com/content/a096d1d0-d2ec-11e2-aac2-00144feab7de. Accessed 21 Nov 2017
40. Oakland, The City that Told Google to get Lost. https://www.theguardian.com/technology/2014/feb/10/city-google-go-away-oakland-california. Accessed 21 Nov 2017
41. Yin, R.K.: Case Study Research: Design and Methods. Sage Publications, Thousand Oaks (1994)
42. Eisenhardt, K.M.: Building theories from case study research. Acad. Manage. Rev. **14**(4), 532–550 (1989)
43. Creswell, J.W.: Qualitative Inquiry and Research Design: Choosing Among Five Approaches. Sage Publications, Thousand Oaks (2013)
44. Eisenhardt, K.M., Graebner, M.E.: Theory building from cases: opportunities and challenges. Acad. Manag. J. **50**(1), 25–32 (2007)
45. Patton, M.Q.: Qualitative Evaluation and Research Methods. Sage Publications, Thousand Oaks (2015)
46. Stake, R.E.: Multiple Case Study Analysis. Guilford Press, New York (2013)
47. City of Medellin. https://www.medellin.gov.co/irj/portal/medellin?NavigationTarget=navurl://ecd9e39fad34752203a60e8a84a34ba1. Accessed 21 Nov 2017
48. Caballero, Argáez, C.: La Economía Colombiana del Siglo XX: Un Recorrido por la Historia y sus Protagonistas, Penguin Random House, Bogotá. (2016)
49. Maclean, K.: The 'Medellin Miracle': The Politics of Crisis, Elites and Coalitions, Development Leadership Program, University of Birmingham, Birmingham (2014)
50. The City of the Year. http://online.wsj.com/ad/cityoftheyear. Accessed 21 NOv 2017
51. Informe de Gestión 2014. http://www.rutanmedellin.org/es/nosotros/ruta-n/informes-de-gestion. Accessed 21 NOv 2017
52. Nooteboom, B.: Innovation, learning and industrial organisation. Camb. J. Econ. **23**(2), 127–150 (1999)
53. Boschma, R.: Proximity and Innovation: A Critical Assessment. Reg. Stud. **39**(1), 61–74 (2005)