

The rise towards excellence of social science in India: a ‘Nobel’ confirmation of the value of economics and further implications

Ion Pohoățã, Ionel Bostan and Radu Constantinescu*

In this article we aim to underline a well-recognized side of social science in India, which lately has witnessed a remarkable qualitative evolution, gaining world pre-eminence. We are referring to that component of social sciences called economics, whose exceptional value was recognized at the beginning of the third millennium with a well-deserved Nobel Prize. Of course, if we are to debate on such a theme, we shall have to take a close look at the work of the Indian economist, Amartya Sen, but we will also undertake an analysis of the Indian culture and economic thinking as a whole. We, as European researchers who study what is valuable around the world (according to our specialization), do notice that Indian culture and economic thinking, followed, to a certain extent, the trend of the ‘old continent’ (Europe), obviously including Marxism in its different facets. On the other hand, we notice that India never lacked ‘great names’ in the area of economic science, especially in the mathematical logic field. The schools of Delhi and Calcutta are some of the most important centres of development of economic thinking, not just for India but for the entire Asia, enjoying the recognition of researchers in the field from Western Europe and USA. Therefore, we considered a brief insight into the evolution of economic thinking in India as appropriate. Finally, we would like underline, as much as possible, the impact of the paradigm change generated by Amartya Sen and his research on freedom, poverty and social choices.

Keywords: Economics, human, hunger and poverty, logical mathematical analysis, Nobel Prize, Senian approach.

INDIA’S economic culture has been, for quite a while, different from that of Europe. There have been orientation, method and even structural differences. Mohandas Karamchand Gandhi perceived Eastern culture as spiritually loaded and inclined towards discovering its own rules and Western culture as having a tradition and tendency towards materialism and unravelling material laws. He also pointed to the fact that the West has developed its civilization by building around its own climate, while the East has a civilization based on its own condition, concluding – and we consider this a particularly interesting aspect that – ‘both are valuable in their area’¹. Gandhi was definitely an exceptional personality in India’s socio-cultural space. This is the reason why Gandhi is considered a source of inspiration for many historians of Indian economy^{2,3}. Our choice to begin the present article with a comparison between the Eastern and the Western eco-

nomical thought traditions is due to our attempt to be able to observe the spectacular evolution of India’s economic thought in relation to the major European economic schools. Another purpose of ours is to emphasize the manner in which the Indian economist Amartya Sen has managed, independently from Gandhi’s work, to draw serious attention of the West to bring India’s economic school of thought to light. Few Europeans had heard about the representative economists of this country, economists who otherwise benefitted from significant intellectual and ideological resources. Weak echoes centred on such names as Jawaharlal Nehru, economist and former Indian Prime Minister from 1947 to 1964, and P. C. Mahalanobis, mathematical statistician who became famous for the distance (dispersion) calculation model between statistical variables – ‘the Mahalanobis distance’^{4,5}. Of course, India never lacked visibility in Asia and neither did Germany in Europe. The parallel is not accidental. We refer to the fact that the founding fathers of the economic schools of historical thought in India, Mahadev Govind Ranade and Romesh Chunder Dutt, managed to establish the Indian historical school by following the German model and its leader, Friedrich List.

Ion Pohoățã and Radu Constantinescu are in the Alexandru Ioan Cuza University, Faculty of Economics and Business Administration, Iasi, Romania; Ionel Bostan is in Stefan cel Mare University, Doctoral School of Economics, Suceava, Romania.

*For correspondence. (e-mail: ionel_bostan@yahoo.com)

Just like in the case of the German historical school, the fundamental concerns of Indian theorists focused on internal, national issues. This led to an isolated or, more precisely, to a self-isolated Indian school, determined by maintaining research at a purely descriptive level, without insisting on finding solutions and without identifying problems which could be solved from the inside. It was specifically during the British India period when many nationalist-oriented thinkers refuted any argument in favour of internationalization⁶. An exception to this rule was Rabindranath Tagore, who argued against excess of nationalism⁷.

Flashback on the imperialist period (1858–1947) and transition

During this period, the historical school economists exerted a strong influence. Their main concerns related to price formation in the agricultural field, and any other issues specific to the British India system were purely explanatory. Among those, Shib Chandra Dutt is the one who showed some interest in general theoretical problems in his work, *Conflicting Tendencies in Indian Economic Thought*¹. Besides these, the whole attention was focused on describing internal problems related to poverty, lack of jobs, village reconstruction, protection of cows or the problem of work capital. Dutt also approached more general topics such as education and the new tendencies in public finance, issues which were not limited to internal analysis, but debated more complex perspectives, thus showing genuine interest for mechanisms available beyond borders. However, they were subject to a descriptive approach as well. Despite all these, India's historical school continued to evolve until the 1940–50 period as Prasanna Parthasarathi, a religion, philosophy and economic history professor at Harvard University tells us^{8,9}. The aforementioned economists were followed on the same doctrinal path by Radhakamal Mukerjee, the founder of the Lucknow School of Sociology and Dhananjay Ramchandra Gadgil, an important personality in the field of Indian economic–sociological thought (1920–1971) as well as an analyst of the period in question. At other levels, the trend of economic schools in India mostly followed the European one, including the Marxist period in its diverse forms. The infusion of Marxist ideas was more seriously felt after 1917, especially due to the settlement of this doctrine in the daily lives of some countries. The influence of this philosophy on the Indian economic thought was a major one¹⁰. It particularly influenced some young economists, thinkers who allowed themselves to be seduced by the revolutionary utopia of the new doctrine as well as by its historicist side, the latter finding here the appropriate environment for development. One of the most influential representatives of this ideology was Damodar Dharmananda Kosambi, a famous mathematician and historian of economics from the

Marxist perspective¹¹. We may say that, although diverse in terms of orientation, the criticism of the economic policy in British India represents the common doctrinal line of movement of the period. However, as Sumit Sarkar shows in *Writing Social History*⁶, it did not materialize in objective and professional research, but on the contrary was limited to a purely descriptive stage, thus following the traditional path. An exception to this predominantly descriptive approach is represented by Dadabhai Naoroji's 'drain theory', by means of which he tries to demonstrate that England, more precisely, British colonialism, generates 'capital drain' from India¹². In order to support his theory, besides purely statistical data, Naoroji tried to demonstrate the 'capital drain' using logical mathematical construction. What he attempted to demonstrate was that the investments performed by England in India were disadvantageous for the latter. In reality, India got to pay more than it received. Naoroji estimated a 250 million pounds capital drain in favour of England. Qualitatively, the factors considered to cause capital drain are the following¹³:

- Foreign government in India.
- The payment that India makes to England for military protection.
- India's support of British administration by means of taxes and dues.

Another extremely important factor which has brought losses to India was the act of opening borders which, as Naoroji states, led to overrated salaries paid to foreign workers (most often brought from England for infrastructure construction). Although criticism has clearly reached beyond purely descriptive borders, it nevertheless remains within the same area, being mostly dedicated to imperialism and less to finding internal solutions. Moving from internal causes to external ones (imperialism) in explaining poverty has been a difficult attempt, specific to all countries which had shared India's experience of being subject to foreign domination.

Things began to gradually change after 1950. Without spectacular initiatives, with eyes still set on the imperialist period, economists who used to defy trends up to that point of time began to make their voices heard. It was during this period that the economists of the Delhi school – one of the most important schools of economics in India, next to the one in Calcutta (now Kolkata) – became known. They had already begun to give up purely historicist approaches. Economists like V. K. R. V. Rao, B. N. Ganguli, P. N. Dhar, Khaleq Naqvi, Dharm Narain, K. N. Raj were popular in Delhi and young economists like Sukhamoy Chakravarty, Jagdish Bhagwati, A. L. Nagar, Manmohan Singh, Mrinal Datta Chaudhuri, Dharma Kumar, Raj Krishna, Ajit Biswas, K. L. Krishna, Suresh Tendulkar came to be well known¹⁴. We would like to add to this list, Amartya Sen, who came to Delhi in 1963 and was a professor there until 1971. Sen's time

at Delhi was the most prolific period in his career. Obviously, India has never lacked great names in the field of economics and, particularly, in its logical mathematical area; it may have suffered from a deficit in visibility, but never in value^{15–18}. The Delhi and Calcutta schools are some of the most important contemporary centres for the development of economic thought. This, we appreciate, favourably influences the economic development in India today as well as in the future¹⁹.

People and theories in the evolution of Amartya Sen

It is generally acknowledged that, an important role in human formation, besides his native inheritance, is played by the pre-existing theoretical and institutional environment. Irrespective of a theory's force, it will remain sterile for the academics, especially the young ones, in the absence of human passion and the emulator effect of discussion and debate. Amartya Sen seems to have had the opportunity to benefit both from a generous pre-existent ideological environment in the issues he approached and the innate passion for curiosity, intellectual knowledge and openness for dialogue. Moreover, he enjoyed the support of other favourable circumstances in his scientific development.

First of all, his education, although at a very young age, at St Gregory's School seems to have been fruitful. The presence of highly intellectual academics is not sufficient in the absence of intellectual curiosity and individual endeavour and Amartya Sen has definitely not avoided the efforts. Secondly, when we refer to freedom, we mean both the freedom of movement and action as well as freedom in general, the particular type of freedom that Amartya Sen describes as offering the individual 'the possibility of self-representation'²⁰. It is hard to tell which of these subjective factors contributed the most. It is certain though that people and, in particular, teachers and family played an extremely important part. The attraction towards economics, as Sen¹⁴ puts it, was driven by two great professors: Bhabatosh Datta and Tapas Majumdar.

Bhabatosh Datta's (1911–1997) influence on Amartya Sen

Datta was a well-known Calcutta school professor, economist and member of the Centre for Studies in Social Sciences (CSSSC), Kolkata. He was influenced by the works of Adam Smith, Alfred Marshall and A. C. Pigou. His research was focused on 'the problem of value rather than distribution, but already recognized that the market mechanism could not take care of basic objectives of a sane society without some help from public authorities'²¹. Datta was an economist who did not restrict himself to identifying problems, but who went further and offered

both economic and political solutions. The point of view expressed in his writings is a social one, with no Marxist temptations. This seems to have influenced Amartya Sen as well, although the fundamental issues for which he became famous (especially social choices and education) appear to have been taken from Majumdar, Datta being closer to the equity and efficiency issues, which are also present in Sen's research.

Tapas Majumdar's (1929–2010) influence on Amartya Sen

It was rather the man Tapas Majumdar than the economist who influenced Amartya Sen. From this perspective, we quote from a short article on Majumdar by Dipankar Dasgupta²² in order to point out the interesting connection between an applicative branch of Sen's theory (poverty seen as capacity deprivation) and his friend's philosophy: 'Tutorial homes had not yet invaded us, and teachers like Tapas Majumdar treated education as a public good that was not for sale'²². This is an impressive and rare aspect in the economic world, a world which often appears to be seized by rather quantitative issues than by qualitative ones. Regarding education as public property grants access to welfare – we do not refer to the one determined by income, but to the one obtained by lifting barriers imposed by the lack of resources necessary to education. It also represents the welfare determined by the free development of capacities. In other words, the limitation or even deprivation of the opportunity to freely develop capacities leads to poverty, an idea which is valid both for India and the rest of the world. Although Amartya Sen's idea to regard poverty as capacity deprivation does not come directly from his professor's theory, but from Adam Smith's *Wealth of Nations*²³, this does not mean that Majumdar's influence on Amartya Sen is any way diluted. Flattering things may also be said about his research. For example, Majumdar shows that 'education is not directly dependent on income or at least there is no close dependence relation between them'²⁴. Under these circumstances, he reaches the conclusion that massive investment in education does not lead to proportional improvement of the act of education. Amartya Sen follows the same line of thought. However, it should not be understood that high-level education is possible without financial investment or that money is not important. It is essential to remember that what matters most is human quality, interpersonal relations and the factor known as will.

Influence of other personalities

Besides the two professors we have mentioned above and other people Sen met in Delhi or Calcutta, his philosophy was also consistently influenced by personalities such as

Aristotle or Tagore – the 1913 Nobel Prize winner in literature, whose humanist vision appears to have left a mark on Sen to a great extent²⁵. Also, we may add here Kenneth Arrow, whose theory on impossibility seems to have constituted an important meditation subject²⁶, or the Neo-Ricardian School founder, Piero Sraffa²⁷ whom Sen met in Cambridge, at Trinity College. The classical Adam Smith, for whose theories, few contemporary economists showed any interest; John Stuart Mill as well as Keynes and many others served as landmarks for Sen's work. However, even though he took over great topics which had already been developed, Sen's contribution is hardly modest and does not follow the line of neo-classical approaches.

Amartya Sen in the context of India's economics

Amartya Sen may be regarded as an unusual economist, one that can hardly fit within a certain doctrine. He clearly avoided any attachment to political trends and parties, but massively contributed to the development of some classical theories with strong applications. In the first stage of his academic evolution, Sen's research efforts were focused on multiple levels, bringing important contributions to each of them. Departing from topics with a consistent mathematical load and reaching purely philosophical ones, Amartya Sen is remarkable due to the peculiar perspective he uses in every domain he chooses to approach. One of the first interesting topics for young Sen in 1951–1976 was social choice and individual value, an issue to which Sukhamoy Chakravarty, a colleague from Presidency College, Calcutta, drew his attention. Although, at that time, Sen did not invest too much effort into the subject due to reasons which were independent of his will, the topic later represented a crucial point in his theories, the most important actually, we may say, next to welfare distribution. In the meantime, we notice his significant contribution to economic debates in 1960, when he published *Choice of Techniques*²⁸. It offers a new perspective on debate of the importance of small-scale industries which troubled India at that time and which were part of the Mahalanobis plan. Controversy was quartered around agricultural efficiency problems. In order to explain inconsistencies, Amartya Sen brought to discussion the shadow price concept or the marginal utility of constraint relaxation. With the help of this indicator, he managed to calculate labour redundancy in real conditions, on real bases. His analysis meant, synthetically speaking, a radical clarification of the divergence problem. This may be considered as his first major contribution to economic theory. Other contributions of his, before 1976, were also related to India's economic problems, Sen was the first economist to achieve labour capital estimations in the country²⁹. Equally important are his contributions to the debates on the problems generated by the productivity dimension in India's agriculture. Even after this period,

while returning to more general issues, he continues to offer solutions to the problems related to hunger and poverty in his country and in many other regions of the world. In evaluating poverty, for example, Amartya Sen reaches one of the most refined mathematical formulas in economics, which is impressive both by efficiency and index final simplicity. Sen starts from the premise that poverty cannot be measured simply by counting the poor according to their income. He considers this an inconclusive modality which cannot offer coherent information. Low income, as Sen states, has an instrumental importance in calculating poverty but, unlike capacity deprivation, lacks inherent value³⁰. It can be observed that he does not exclude the importance of income, but he considers it inadequate to occupy the central element position next to the number of poor in poverty evaluation. Even more, income, as independent from other factors, cannot be the only element of calculus. Its dimension varies according to area, age and degree of development. Under such circumstances, Sen offers an extremely elegant solution where the role of income is taken over by what is called capacity deprivation (I). This concept of purely Senian origin joins per capita poverty rate or the poverty headcount ratio (H) and the statistical dispersion of income distribution disparity representation. It is precisely the dispersion indicator achieved by Corrado Gini also known as the Gini coefficient (G).

With these elements which substantially modify the basic structure of the calculus, we finally reach the following formula

$$P = H [I + (1 - I)G].$$

The indicator we obtain is named 'Sen index' and it is extremely efficient in measuring poverty (P) in a manner which is much closer to reality than other methods.

Economists like Pigou (1912)³¹, Dalton (1920)³², Kolm (1969)³³, Atkinson (1970)³⁴, Dasgupta (with Sen – 1973)³⁵, and Rothschild and Stiglitz (1972)³⁶ also worked in the same poverty analysis and inequality measurement line. Of these, only the last four dealt closely with poverty, others being more interested in inequality measurement. By taking into account poverty seen from a limited perspective, i.e. calculated as the number of individuals (the classical calculation), using the dispersion coefficient and introducing the calculus indicator of capacity deprivation, Sen manages to bring by far the most important and original contribution in this area. This poverty measurement parameter, which is an exclusively Senian solution, is not his last contribution, but is nevertheless his most controversial one. Specialized literature mentions some positions which were not fully elucidated as well as different opinions in defining poverty³⁷ and the limited possibilities of measuring it.

Despite all these, what Sen achieved was acknowledged as a valuable asset for economics. The limitations

of the mathematical calculus are inherent, but the use of this parameter is, up to now, the best solution without claiming to be the perfect one. Besides all the contributions Amartya Sen made due to his abilities in pure mathematics, we consider of even greater importance his share in the area of freedom and rationality due to logical mathematics and philosophy. Placing the value conferred by freedom before the value conferred by wealth, is a tribute to freedom brought by Sen. At a glance, this might not mean much; but from an economic perspective, this substitution manages to turn upside down everything that had been previously built in the welfare theory. This theory is one of the factors which turned Sen into an atypical economist with a considerable force in terms of logical mathematical argumentation and special care for human problems and, in particular, poverty. As far as the rationality and, implicitly, choice theory is concerned, Sen manages to make himself noticed once more and this time due to his logical philosophical abilities. He clarifies the conditions to validate the central axiom in the internal theory of choice. Sen demonstrates that the internal consistency of choice premise is invalid in the absence of an external parameter. In other words, the internal consistency of choice axiom is invalid in the absence of parameters external to the self-choice function. We cannot analyse behaviour in making a choice by strictly referring to behaviour and nothing else. In Senian terms, 'behavior without reference to anything other than behavior'³⁸ is an approach generating inconsistency. Of course, this theory is too complex to be described in a few sentences. What should be synthetically remembered is that Sen has been interested in behavioural economics as well as in the psychological area before action itself. The manner in which Sen treats the internal inconsistency problem represents valuable support in the economic rationality analysis.

Amartya Sen's influence on other researchers

Due to the significant contributions Sen has made to economics as well as the fact that, in 1998, he was awarded the Nobel Prize for Economics, it is only natural for Sen to be a great influence on other researchers. For this reason, we strongly believe that India's economic sciences will have the opportunity to offer to the world exceptional specialists in the future as well. One of his close followers, both in the analysis system and in the topics he approached, is Jean Drèze³⁹, a Belgian naturalized in India and a professor at New Delhi. He has been particularly interested in topics related to poverty and hunger. Together with Amartya Sen, Drize has written a considerable number of books and articles, among which we mention: *Hunger and Public Action*, which comprises studies on India as well as on other countries – China, Chile, Sri Lanka or Costa Rica; *The Political Economy of Hunger*, is a volume which comprises the articles of

authors like Partha Dasgupta or Debraj Ray and deals with topics related to food and nutrition economics, economy and rights, policies and life standard. The Sen model was followed by many other economists and philosophers as well, among whom we may mention Martha Nussbaum – a feminist interested in political philosophy and capability development^{40,41}. Consequently, in 2003, she founded the Human Development Capability Association. The same path was followed by the economist of French origin, Esther Duflo and Abhijit Banerjee, who continued research in the social economics area⁴². Moving beyond the strictly social part, often associated with Neo-Marxism, Sen influenced in 'the theory of choice' personalities like Kaushik Basu, an Indian economist, vice-president of World Bank and follower of the development theory from Senian perspective⁴³. Kotaro Suzumura⁴⁴, was also influenced by Sen in the area of rational choice, social choice theory and collective choices. Under the same influence, the economist Mahbubul Haq has specialized in game theory and is acknowledged for his contribution in Human Development Report⁴⁵. Finally, we may add that Amartya Sen is undoubtedly a complete economist and, in the near future, important names in economics will owe him a great deal for their formation on the basis of Senian contribution by following perhaps his pattern of lack of political commitment, a method which should be more familiar to the academic world in its search for the truth.

Conclusion

Breaking patterns and Nobel Prize nomination and selection due to exceptional results did not take place in a country which lacked initiative in the field of economics. Until Amartya Sen, ideas were floating in the air. In a nationalist-historicist cover, similar to India's specificity, comparable to that of Germany in the initial stage of its growth, the economic thought in India provided a prolific environment for top development. This environment has been prepared by following a trend similar to the European one, assimilating certain values from the latter, including Marxist ones. Two schools have proven remarkable in this respect – Calcutta and Delhi – even though the research carried out there was focused rather on the description of some real internal problems (poverty, the uneven exchange with the British Empire, lack of jobs, village reconstruction, etc.) than on pure analysis. It is in this environment that Amartya Sen makes his debut, grows and becomes a top economist in India and in the whole world. He is an economist who has known the influence of some famous Indian and European professors and who has been educated under the guidance of some great universities of the civilized world, where he became interested in intellectual curiosity and the attributes which define man in general. He is an economist

who has never forgotten the problems of his country, either past or present. Consequently, his work has been focused on topics like freedom, poverty and social choice. However, Amartya Sen is not simply 'an Indian economist'. He penetrates the universal economic science with works on welfare distribution, divergence, capacity deprivation, poverty measurement parameter, value offered by freedom, behavioural economics, economic rationality, etc. The Nobel Prize winner, Amartya Sen still teaches and has apprentices who develop his work in India and beyond its borders. Many well-known economists in the world work in the spirit of his ideas. Thanks to him and to those who follow and develop his work, Indian economic science acquires universal appreciation. The Indian economic school owes to Amartya Sen its evolution into a spiritual state, thus breaking the limits of geographical location and reaching a level where man, with his needs and interests, represents, in a purely Senian manner, both the departure and the final point.

1. Dutt, S. C., *Conflicting Tendencies in Indian Economic Thought*, N. M. Ray-Chowdhury & Co, Calcutta, 1934.
2. Dasgupta, A. K., *Gandhi's Economic Thought*, Routledge, London, 1996.
3. Dasgupta, A. K., *A History of Indian Economic Thought*, Routledge, London, 1993.
4. Mahalanobis, P. C., On the generalized distance in statistics. In Proceedings of the National Institute of Sciences, Calcutta, 1936, vol. 2, pp. 49–55.
5. De Maesschalck, R., Jouan-Rimbaud, D. and Massart, D. L., The Mahalanobis distance. *Chem. Intell. Lab. Syst.*, 2000, **50**, 1–18.
6. Sarkar, S., *Writing Social History*, Oxford University Press, Oxford, 1998.
7. Gibson, M. E., *Indian Angles: English Verse in Colonial India from Jones to Tagore*, Ohio University Press, Ohio, 2011.
8. Parthasarathi, P., *Why Europe Grew Rich and Asia Did Not: Global Economic Divergence, 1600–1850*, Cambridge University Press, Cambridge, 2011.
9. Parthasarathi, P., *The Transition to a Colonial Economy: Weavers, Merchants and Kings in South India, 1720–1800*, Cambridge University Press, Cambridge, 2001.
10. Khondakar, G. M., *The Judgment Against Imperialism, Fascism and Racism Against Caliphate and Islam, Vols 1 and 2*, Author-House, Indiana, 2008.
11. Kosambi, D. D., *An Introduction to the Study of Indian History*, Popular Prakashan Pvt Ltd, Bombay, 1985.
12. Ganguli, B., *Dadabhai Naoroji and the Drain Theory*, Asia Publishing House, Bombay, 1965.
13. Ganguli, B., Dadabhai Naoroji and the mechanism of 'external drain'. *Indian Econ. Soc. Hist. Rev.*, 1965, **2**, 85–102.
14. Sen, A., *Autobiography*, 1998; http://www.nobelprize.org/nobel_prizes/economics/laureates/1998/sen.html
15. Islahi, A. A., Dadabhai Naoroji – from economic nationalism to political nationalism. In *Economic Thought of Dadabhai Naoroji* (ed. Hajela, P. D.), Deep & Deep Publication, New Delhi, 2001, pp. 85–91.
16. Balakrishnan, P., *Economic Growth in India: History and Prospect*, Oxford University Press, New Delhi, 2010.
17. Rothermund, R., *An Economic History of India: From Pre-Colonial Times to 1991*, Routledge, London, 1993.
18. Raychaudhuri, T. and Habib, I., *The Cambridge Economic History of India, Vols 1 and 2*, Cambridge University Press, Cambridge, 1982, 1983.
19. Bostan, I. and Pohoata, I., The dynamics of population of Indian origin in Romania and its current socio-economic implications. *Curr. Sci.*, 2013, **104**, 1016–1021.
20. Sen, A., *Dezvoltarea ca Libertate*, Editura Economică, Bucharest, 2004.
21. Bagchi, A. K., Bhabatosh Datta. *Econ. Polit. Wkly*, 1997, **32**, 872–875.
22. Dasgupta, D., Obituary. *The Telegraph*, 19 October 2010; http://www.telegraphindia.com/1101019/jsp/opinion/story_13073179.jsp
23. Smith, A., *The Wealth of Nations*, Penguins Books Limited, London, 1999.
24. Majumdar, T., *Investment in Education and Social Choice*, Cambridge University Press, New York, 1983.
25. Gupta, S. K., *The Philosophy of Rabindranath Tagore*, Ashgate, Aldershot, UK, 2005.
26. Sen, A., *Rationality and Freedom*, The Belknap Press of Harvard University Press, Cambridge/Mass., USA, 2002.
27. Sraffa, P., *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory*, Cambridge University Press, Cambridge, 1960.
28. Sen, A., *Choice of Techniques*, Basil Blackwell, Oxford, 1960.
29. Sen, A., Working capital in the Indian economy. In *Pricing and Fiscal Policies* (ed. Rosenstein-Rodan, P. N.), Allen and Unwin, London, 1964.
30. Desai, M., Amartya Sen's contribution to development economics. *Oxford Dev. Stud.*, 2001, **29**, 213–223.
31. Pigou, A. C., *The Economics of Welfare*, Macmillan, London, 1932.
32. Dalton, H., The measurement of the inequality of incomes. *Econ. J.*, 1920, **30**, 348–361.
33. Arrow, K. J. and Debreau, G., *Landmark Papers in General Equilibrium Theory, Social Choice and Welfare Selected by Kenneth J. Arrow and Gerard Debreu*, Edward Elgar Publishing Ltd, Cheltenham, UK, 2002.
34. Atkinson, A. B., *Poverty in Britain and the Reform of Social Security*, Cambridge University Press, Cambridge, 1969.
35. Sen, A., *On Economic Inequality: Expanded Edition with a Substantial Annex by James E. Foster and Amartya Sen*, Oxford University Press, Oxford, 1997.
36. Rothschild, M. and Stiglitz, J. E., Some further results on the measurement of inequality. *J. Econ. Theory*, 1973, **6**, 188–204.
37. Atkinson, A. B., The contributions of Amartya Sen to welfare economics. *Scand. J. Econ.*, 1999, **101**, 173–190.
38. Sen, A., *Rationality and Freedom*, The Belknap Press of Harvard University Press, Cambridge/Mass., USA, 2002.
39. Drèze, J. and Sen, A., *The Political Economy of Hunger*, Oxford University Press, Oxford, 1991.
40. Nussbaum, M. and Sen, A., *The Quality of Life*, Oxford University Press, Oxford, 1993.
41. Nussbaum, M. C., *Creating Capabilities. The Human Development Approach*, Harvard University Press, Harvard, 2011.
42. Banerjee, A. and Duflo, E., *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, Public Affairs, New York, 2011.
43. Basu, K. and Kanbur, R., *Arguments for a Better World: Essays in Honor of Amartya Sen: Volume II: Society, Institutions, and Development*, Oxford University Press, Oxford, 2008.
44. Gotoh, R., Suzumura, K. and Yoshihara, N., Extended social ordering functions for rationalizing fair allocation rules as game forms in the sense of Rawls and Sen. *Int. J. Econ. Theory*, 2005, **1**, 21–41.
45. Official website of UNDP Human Development Report Office, June 2013; <http://hdr.undp.org/en/humandev/ulhaq>

Received 25 July 2013; revised accepted 23 December 2013