Changing Paradigm in Trade Theories: A Review and Future Research Agenda

Rajesh Panda, Madhvi Sethi* and Srijani Chaudhuri

Symbiosis Institute of Business Management, Symbiosis International University, Bengaluru-560100, Karnataka, India; director@sibm.edu.in, madhvi.sethi@sibm.edu.in, srijani.c18@gmail.com

Abstract

Objectives: The objectives of the study were to understand the evolution of trade theories and their application across nations over a period of time and to provide future direction of research for international trade. **Methods/Statistical Analysis**: To meet the objectives, the study undertook a comprehensive review of literature to bring together works of different researchers in the area of international trade. It summarizes the past theories and applications with the research advancements over the years. **Findings**: The study finds that over the years, research in international trade has evolved with new forms of models coming into existence. Many trade theories like absolute advantage, comparative advantage, factor endowment, factor price equalization, gravity model etc. have emerged and applied. At the same time, the trade environment across the developed and developing countries has metamorphosed with the advent of World Trade Organization and multiple trade blocs. Several factors have significantly gained importance, thus leading to a need of new dimensions in trade research. **Conclusion/Improvements**: The study proposes development of trade models which could incorporate pace of technological development and innovation, economic shocks like financial crisis, Brexit etc. and changes in global value chains. It also highlights the importance of future research in trade in services.

Keywords: Gravity Model, International Trade, Trade Models, Trade Theories

1. Introduction

Trade between countries is an integral part of globalization. In the past, trade has made it possible for lemons of Arabian origin to reach to the rest of the world, or coffee from Ethiopia to reach India. In today's world, trade in both goods and services is shaping economies and crafting new relations between countries. As per the UNCTAD report¹, international trade added USD 20 trillion during the periodfrom1990 to 2014, being USD 4 trillion in 1990 and USD 24 trillion in 2014. Factors like favourable trade policies, new business models of reduced cross border costs and technological innovation have attributed to this growth.

Also, allegiance to trade agreements have had an impact on the way trade flows have been administered. On 4th February, 2016, the Trans-Pacific Partnership Agreement proposal was signed which had twelve Pacific Rim countries (excluding China) as its members. The new agreement was formed to "promote economic growth;

*Author for correspondence

support the creation and retention of jobs; enhance innovation, productivity and competitiveness; raise living standards; reduce poverty in the signatories' countries; and promote transparency, good governance, and enhanced labor and environmental protections.". The focus of this agreement highlights the changing paradigms of international trade. Due to the many changes that nations have undergone in the past decade, there is a need to relook at the theories of trade and propose the future direction of research which could incorporate these changes.

This paper makes an attempt to understand the evolution of various theories in trade, their application and subsequent modification over the years. The paper proposes future direction for research with shifting trade patterns and emerging new relations between countries. It tries to integrate the old theories, new theories and the changes which could enhance the research in the area of international trade.

2. Traditional Trade Theories

Mercantilism, as one of the oldest theories of trade, can be traced back to 16th century in Europe. As per the concept of Mercantilism a country's wealth was measured by its holding of treasure, usually gold. The key objective of trade as per the Mercantilism was to have a favorable balance of trade and the stability of a country was judged by the amount the country would export more than its import⁴. As per the Mercantilism doctrine, the nation followed self-interest strategies and strict price mechanism for its own benefit. This was later condemned by many liberal economists⁵. Nevertheless, the idea of mercantilism brought in the formal concept of standard international trade theory. It dates back to 1776 when the theory of absolute advantage was coined by Adam Smith. As opposed to Mercantilism, Adam Smith advocated free trade. He suggested that because different countries could produce some goods more efficiently than other countries, there could be higher global efficiency through free trade. This was termed as absolute advantage of nations ⁶. With absolute advantage, few countries could witness continuous surplus if they were efficient in producing many goods compared to others. For instance, in a two country economy producing only two goods, it was seen that country A could produce more of both the goods compared to country B, so the problem was to figure out whether there should be any trade relation between the two countries or not. This condition was addressed by comparative advantage of nations $\frac{7}{2}$. It specified that global efficiency gains from trade would result when countries specialized in producing products more efficiently irrespective of other countries producing the products more efficiently. As per Ricardo, this was because of the difference in opportunity cost. This was a revolutionary theory as, if comparative advantage exists, any country could trade with the other and prosper, irrespective of their size.

Several empirical tests have validated Ricardian Theory over the time. If it was assumed that there were only two countries, each would export those goods for which the ratio of its output per worker to that of the other exceeded the monetary wage rate to that of the other ^{8.9}. Similar findings were reported by Stern ¹⁰ where the differences in the relative labor productivity and production costs in selected manufacturing industries were reflected in differences in the relative export performance. However, Robinson ¹¹ argued that Ricardo's theory assumed various conditions like static equilibrium position, optimum employment etc. which might be difficult to maintain in the real world.

Heckscher and Ohlin (H-O)¹² proposed that countries tended to export goods whose production was concentrated in factors with which they were plentifully endowed. For example, if Country X was labor intensive country and country Y was land intensive, then Country X should produce a good which needed more labor. This came to be popularly known as H-O theorem. Like any other model, empirical tests were conducted on H-O Theorem that supported the conclusions of H-O theorem. Testing the 1947 U.S. data, it was seen that United States (U.S.), being a Capital intensive country was exporting labor intensive goods 13. This came to be known as the Leontief paradox and it was completely contradictory to the H- O Theorem. Empirical studies confirmed Leontief paradox at broader level, i.e. trade was not always in the form as the H.O. theorem predicted 14. Samuelson15 postulated a new theorem, which said, international trade would eventually lead to a state of equal relative and absolute returns to similar factors across nations. This theorem was known as factor price equalization theory. Golub and Hsieh 16 examined the relationship between relative unit labor costs and trade for United States and United Kingdom, Japan, Australia, Canada and Germany. The results proved that relative unit labor cost helped to explain trade behavior for the nations. Table 1 summarizes the traditional theories.

3. Advances in Trade Theory Research

Researchers, over a period of time, contributed to trade theories by adding relevant variables impacting trade. The size of the domestic market came into prominence with Linder ¹⁷ suggesting that a country exported those manufactured products for which there existed a large domestic market. Linder proposed a demand perspective of trade in contrast to the usual supply perspective. His conclusion was that countries having similar demand would be able to create similar industries and wouldlead to trade insimilar but differentiated goods, which differed from Ricardian theory and H-O theorem. Linder provided positive relationship between trade intensity and international similarity in per capita GNP (Linder variable). Johnson ¹⁸ came out with a view that this positive relationship could also be because of proximity between trading nations. Hirsch and Lev¹⁹ considered Linder variable and distance as determinants of international trade.

It has also been argued that trade was not because of comparative advantage of nation but due to economies of

Trade Theory	Author	Year	Findings
Merchantilist Law		1500- 1800	A country's wealth was measured by its holding of treasure(usually gold) and the country should export more than what they import.
Absolute Advantage	Adam Smith	1776	Free trade would increase global efficiency.
	David Hume	1776	With absolute advantage few countries were witnessing continuous surplus. hence came the dilemma of monetary adjustments. Therefore the need of automatic adjustment came in.
Comparative Advantage	David Ricardo	1817	Global efficiency gains from trade would result when countries specialized in producing products more efficiently irrespective of other countries producing the products more efficiently.
Factor- Endowment Theory or Heckscher-Ohlin Theory	Eli Heckscher and Bertil Ohlin	1933	Countries with "abundantly endowed" factors tend to export goods which are produced by utilizing these factors.
	G. D. A. MacDougall	1951- 1952	Comparison of exports of twenty five industries in US and UK. Found strong support for Ricardo's theory.
Factor- Price Equalization Theorem	Paul Samuelson	1948	International trade would lead toa state of equal relative and absolute returns to similar factors.
Leontief Paradox	Wassily Leontief	1956	Empirical test on H-O Theorem. Testing the 1947 U.S. data. it was seen U.S. being a capital intensive country was exporting labor intensive goods
Empirical Test on H-O Theorem	Robert M. Stern. Keith E. Maskus	1981	Applied to US Trade. Found that data for 1958 upheld Leontief Paradox.
	Harry P. Bowen. Edward E. Leamer. Leo Sveikauskas	1987	The result confirmed Leontief Paradox at broader level
	S. S. Golub and C. T. Hsieh	2000	Examined the relationship between relative unit labor costs and trade for U.S. and U.K Japan. Germany. Canada and Australia. The results proved that relative unit labor cost helped to explain trade patterns for the nations.

Table 1. Summary	v of traditional	trade theories
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scale²⁰. Economies of scale created arbitrary specializations by similar countries in the production of different goods, often goods produced with same factor intensity. This explained some of the loopholes of H-O theorem. Krugman and Helpman^{21,22} also brought a different perspective to international trade by integrating it with market structure.

With the increase in complexities, a new dimension was added to the existing models, the existence of interindustry production differences. Helpman²³ demonstrated that more the share of bilateral intra-industry trade less would be dispersion of per capita income. Therefore, the more similar factor structures in countries were, the bigger would be the share of intra- industry trade.

In a later study, Eaton and Kortum 24 examined quantitatively the effect of several global shocks on plant

entry and exit, labor turnover and productivity in U.S. When the distribution of productivity across different firms was Pareto- efficient then the observed size distribution of US firms showed different results²⁵.

In new theories, the study of trade shifted towards firms and not countries. It came to be believed that firms traded and not nations. Such studies focused on the way firms do trade, thus demonstrating a relation between productivity and trade and how this would affect the trade policy in the 21st century. The new thought envisaged that if stress was given to the research and development at the firm level, the trade behavior of the country would increase as a whole²⁶.

Another model of international trade that gained momentum in the last few decades was in the form of the

Gravity Model. It stated that trade volume between two countries was inversely proportional to the geographical distance between the countries and directly proportional to the gross domestic products²². Over the time, this simple relationship has been researched upon extensively and its extensions have been validated over a period of time. Gravity model accommodated variables like price²⁸, per capita income and contiguity²⁹, common colony and common language³⁰ and several others. The concept of gravity model has also been used to compare trade for developed countries^{31,32} and developing countries^{33,34}. Several researchers also brought in the impact of trade blocs on the trade flows^{35,36,37,38,39,40}.

Over the years, trade theory researchers have been studying the impact of interconnected product markets and segmented factor markets. However, many models of regional economics have looked at the joint effects of geographical movement of goods and factors.

With respect to this, Location theory has gained prominence over the years. Economists working in the field of international trade group the location theory into three categories including neoclassical theory, new trade theory and new economic geography. Brulhart ⁴¹ surveyed the studies based on the new theoretical thinking. Table 2 provides a summary of the studies.

4. Agenda for Future Research and Application

Trade theories have developed from mercantile theory to theory of absolute and comparative advantage to factor endowment to gravity model over the years. In the past, researchers have changed the form and structure of the various trade theories in accordance with the environmental and institutional changes. Empirical evidence helped in the understanding of the theories across different geographies and over a period of time. Not only did the theories developed into applications but also they were instrumental in forming policies governing trade in different nations. However, a lot more can be done in this area in terms of research and application as there is a need to understand the new paradigms of trade shifts which have happened in the last decade. A new and different perspective is needed to give meaning to the way trade is conducted today.

After reviewing different theories in the previous sections, this section proposes future direction for research in this area:

In recent years, trade drivers have shifted towards labour and cost arbitrage. Nations have used technology and innovations to motivate this change. As per the UNCTAD Key statistics and trends report 2015, "The production structure of the past where goods, services, people, technology and capital remained within national borders was internationalized so as to take advantage of lower cross-border transaction costs driven by technological innovations and more open trade policies."

Therefore, research needs to address this new perspective about technology-rich and innovative nations and there trading strategies. Policy makers would want to see if a nation is technologically and innovatively rich then how would it impact bilateral and multilateral trade flows. Hufbauer⁴² researched the technology factor in

Authors	Year	Findings
Linder	1961	A nation exported those manufactured products for which a large domestic
Linder		market exists.
Krugman ^{21,22}	1980. 1981	Talked about monopolistic competition and economies of scale. Krugman refuted the
litiuginun		H.O Model and posed several arguments challenging it.
Helpman and Krugman	1985	Assumed increasing returns to scale and a state of monopolistic competition between
		the firms.
Helpman	1987	Contributed to Krugman's work. The findings demonstrated a negative relation
Teipinan		between intra-industry trade and per capita income.
Helena and Nilsson	1999	Identified the common market with the help of income overlap and related its size to
		size of home market. This led to the formation the new Linder-variable.
		Fitted the model to bilateral trade on US data. Examined quantitatively the
Eton and Kortum	2002	impact of global shifts on productivity. plant entry and exit. and labor turnover
		in U.S. manufacturing.
Chaney	2008	Introduced firm-level heterogeneity

Table 2. Summary of advances in trade theory research

international trade and later researchers like Nadiri⁴³, Harrigan⁴⁴, Keller^{45,46} provided some evidence on the technology spillover effects.

However, the change in technological innovations has been tremendous during the last decade e.g. use of drones, use of mobiles, robotics and automation, online marketplace etc. These have redefined the extant of trade. Online marketplace has paved the way for easier access to global merchandise and services marking a shift in world trade. These variables need to be studied in detail for a better understanding of trade flows.

Over the last decade, there have been multiple economic shocks like subprime crisis, euro zone crisis, migration crisis, Brexit etc. which have had tremendous impact on trade. The spillover effects of each of these would be interesting to study not only for developed economies but also for developing economies. A probabilistic model estimation on these effects would help in understanding the impact of these shocks especially Brexit on global trade.

Most of the research in the area of international trade has been emphasizing the export and import of goods. However, it has now become imperative to look into the trade dynamics of services. As per the UNCTAD report, services trade increased significantly for the period from 2004 (US \$ 2 trillion) to 2014 (US \$ 5 trillion). Global communications services exports reached an estimated US\$ 115 billion in 2014, recording 9 percent average annual growth since the year 2000 due to increase in he use of mobile phones⁴⁷. With the advent of information technology and its use in several sectors, trade characteristics of services should be widely studied. The validation of trade theories in service sector would be an interesting question to research on. Very few researchers have filled this gap in trade research, Kimura and Lee 48, Ceglowski49, Tharakan, Beveren and Van Ourti⁵⁰ to mention a few. There is scope to explore this aspect further.

Another aspect which might need further exploration could be the shift in the global value chains and fragmentation.

5. Conclusion

This paper is an attempt to bring together significant theories of international trade and propose future direction of research in the area. The paper describes the advent and development of trade theories beginning from Mercantilist theory till gravity model. It describes the empirical evidence provided for different theories and its applications. After reviewing several works of research in the area of international trade, future direction for research has been outlined. Due to significant changes in the world economy, there is a need to develop new models of trade. These could include the impact of changes in technology and innovation. Since the last decade witnessed several economic and political shocks, research could focus on understanding their impact on trade flows e.g. Brexit and Subprime crisis. Another area of research proposed in the paper includes development of models for trade in services. The research agenda proposed in the paper would not only help in highlighting new paradigms of trade but also provide implications for policy makers.

6. References

- 1. UNCTAD. Key statistics and trends in international trade. United Nations Publication. Geneva, Switzerland; 2015.
- 2. Bastable CF. The theory of international trade. MacMillan and Co. Ltd., London; 1917.
- 3. Viner J. Studies in the theory of international trade. Harper and Brothers Publishers. New York; 1937.
- 4. Grampp WD. The liberal elements in English mercantilism. The Quarterly Journal of Economics. 1952:465–501.
- Chalk AF. Natural law and the rise of economic individualism in England. The Journal of Political Economy.1951:332–347.
- Smith, A. The Wealth of Nations. New York. Bantam Dell; 1776, 2003ed.
- 7. Ricardo D. On The principles of political economy and taxation. Kitchener, Batoche Books. 1817.
- MacDougall GDA. British and american exports: A Study Suggested by the Theory of Comparative Costs. Part I. The Economic Journal. 1951:697–724.
- MacDougall G. D. A. British and American Exports: A Study Suggested by the Theory of Comparative Costs. Part II. The Economic Journal. 1952:487–521.
- Stern RM. British and american productivity and comparative costs in international trade. Oxford Economic Papers.1962:275–296.
- 11. Robinson J. Prelude to a critique of economic theory. Oxford Economic Papers. 1961; 13(1):53–58.
- Ohlin B. Interregional and International Trade, Harvard University Press. Cambridge, MA: 1933.
- Leontief W. Factor Proportions and the Structure of American Trade: Further Theoretical and Empirical Analysis. The Review of Economics and Statistics. 1956: 386–407.
- Bowen HP, Leamer EE, and Sveikauskas L. Multicountry, Multifactor Tests of the Factor Abundance Theory. The American Economic Review. 1987:791–809.
- 15. Samuelson PA. International trade and the equalization of factor prices. The Economic Journal. 1948:163–184.

- Golub SS, and Hsieh CT. Classical ricardian theory of comparative advantage revisited. Review of International Economics. 2000; 8(2):221–234.
- 17. Linder Staffan Burenstam. An Essay on Trade and Transformation. New York. 1961.
- 18. Johnson H. Review of 'An Essay on Trade and Transformation' by Staffan Burenstam-Linder. Economica. 1964;31:86–90.
- Hirsch Z.and Lev B. Trade and Per Capita Income Differentials: A Test of the Burenstam-Linder Hypothesis. World Development. 1973;1(9):11–17.
- 20. Helpman E. and P. Krugman. Market Structure and International Trade. MIT Press. 1985.
- Krugman P. Scale Economies, Product Differentiation, and the Pattern of Trade. The American Economic Review.1980; 70:950–959.
- 22. Krugman P. Increasing Returns to Scale, Monopolistic Competition and International Trade, Journal of International Economics, IX (1979). 1981: 469–79. Intraindustry Specialization and the Gains from Trade," Journal of Political Economy. 1981; 89:959–73.
- 23. Helpman E. Imperfect competition and international trade: Evidence from fourteen industrial countries. Journal of the Japanese and international economies. 1987; 1(1):62–81.
- 24. Eaton J. and Kortum S. Technology, Geography, and Trade. Econometrica. 2002:1741–1779.
- **25.** Chaney T. Distorted gravity: The intensive and extensive margins of international trade. The American Economic Review. 2008; 98(4):1707–1721.
- 26. Ciuriak D, Lapham B, Wolfe R, Collins-Williams T. and Curtis JM. New-new Trade Policy (No. 1263). Queen's Economics Department Working Paper. 2011.
- 27. Tinbergen J. An analysis of world trade flows in shaping the world Economy:Suggestions for an international economic policy. The Twentieth Century Fund. New York.1962.
- Bergstrand JH. The gravity equation in international trade: Some microeconomic foundations and empirical evidence. The review of economics and statistics. 1985:474–481.
- 29. Eichengreen B. and Irwin Douglas A. The role of history in bilateral trade flows. In Frankel, J. A. The Regionalization of the World Economy, University of Chicago Press, Chicago.1998. p. 33–62.
- 30. Mayer T. and Zignago M. Market Access in Global and Regional Trade.CEPII Working Paper 2, CEPII. 2005.
- Leitao. Nuno Carlos.(2010). The gravity model and United States' Trade. European Journal of Economics. Finance and Administrative Services. 21. 92–100.
- 32. McCallum J. National borders matter: Canada-us regional trade patterns; American Economic Review .1995; 85:615–623.
- Eichengreen B, Rhee Y. and Tong H. China and the Exports of Other Asian Countries. Review of World Economics.2007; 143(2):201–226.

- 34. Panda R, Sethi M. and Kumaran M. A study of bilateral trade flows of China and India. Indian Journal of Science and Technology. 2016; 9(15):1–7.
- **35.** Rose AK. Do we really know that the WTO increases trade? American Economic Review.2002.
- 36. Lee JW.and Park I. Free Trade Areas in East Asia: Discriminatory or Non-discriminatory? World Economy.2005; 28(1):21–48.
- Martinez-Zarzoso I. and Nowak-Lehmann F. Augmented Gravity Model: An Empirical Application to Mercosur-European Union Trade Flows. Journal of Applied Economics.2003; 2(2):291–316.
- Carrère C. Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model. European Economic Review.2006; 50(2):223-247.
- 39. Zidi A. and Dhifallah SM. Trade Creation and Trade Diversion between Tunisia and EU: Analysis by Gravity Model. International Journal of Economics and Finance.2013; 5(5): 131–147.
- Kabir M.and Salim R. Can gravity model explain BIMSTEC's Trade? Journal of Economic Integration.2010; 25(1):144– 166.
- 41. Brülhart M. Trading Places: Industrial Specialization in the European Union. JCMS: Journal of Common Market Studies. 1998; 36(3):319–346.
- 42. Hufbauer G. The impact of national characteristics and technology on the commodity composition of trade in manufactured goods. In The Technology Factor in International Trade (p. 145–231). National Bureau of Economic Research.1970.
- Nadiri MI. Innovations and technological spillovers (No. w4423). National Bureau of Economic Research.1993.
- Harrigan J. Cross-Country comparisons of industry total factor productivity: Theory and Evidence (No. 9734). Federal Reserve Bank of New York.1997.
- 45. Keller W. Do trade patterns and technology flows affect productivity growth? World Bank Economic Review.2000; 14:17–47.
- Keller W. International technology diffusion. NBER Working Paper No. 8573.2001.
- 47. WTO. International trade statistics. World Trade Organization Publication.www.wto.org/statistics. 2015.
- Kimura F. and Lee HH. The Gravity Equation in International Trade in Services. Review of World Economics.2006; 142(1):92–121.
- 49. CeglowskiJ.DoesGravityMatterinaServiceEconomy?Review of World Economics.2006; 142(2):307–329.
- Tharakan PKM, Van Beveren I. and Van Ourti. T. Determinants of India's Software Exports and Goods Exports. Review of Economics and Statistics.2005; 87(4):776–780.