Impact of Artifical Intelligence on International Trade

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Abstract

This paper investigates the impact of artificial intelligence (AI) on international trade. The service trade includes the AI trade. According to many economist service trades doesn't hold much impact in the long-run economy of a country. This outlook overshadows the advantages of the AI business. India is in the top 10 countries in the AI business, which is a clear result of its success. Our main motive is to get an idea of how this is helping India and other countries in lifting their economy.

The exponential rise in the computing power of AI has lifted AI to the forefront of business activities and the public policy agenda worldwide. Some renowned companies such as Microsoft, IBM Google, Nvidia, intel etc. have already invested in Artificial intelligence. It is predicted that the global AI software Market will reach $62 billion in 2022. According to IDC, the global AI market including hardware, software and services is expected to grow 19.6% year over year to $432billion in 2022.

Even India's ecosystem is booming, with many innovative companies entering the field such as Bosch, Tata Elxsi, NextbillionAI,Wysa, Yellow.ai etc. The Indian Government raised their investments in Digital India to $477 million in 2020 to boost AI, IoT, Machine learning, and robotics. Finance minister Nirmala Sitharaman announced in the 2019 Union Budget that the government will be providing industry-relevant skill training to 10 million youth in India in areas such as AI, Big Data and Robotics. We strongly believe that more companies should utilise this encouragement of the government, and should invest more on the artificial intelligence sector which is consistently growing and will soon be an integral part of the world economy.

Keywords: AI, Big data, Robotics, Service Trade

Introduction

To describe machines performing human like cognitive processes like reasoning,

interactions, and understanding the term AI (artificial intelligence) is used. AI looks increasingly likely to transform the way in which the modern society is working, but it remain largely uninformed. With the rise of AI on is also challenging the businesses, consumers and economy in a general term. The employees are showing interests in knowing what AI actually is and how it will affect their jobs and incomes. Governments around the world are spending the public funds on AI freely to acquire their favoured regions, including the Vector Institutes in Toronto and the Tsingha-Baidua. Many counties are negotiating agreements that will constrains the ability of sovereign govt to regulates ai, such as NAFTA and TPP-11 and also businesses are also keen to find ways in which they can capitalise on the opportunities formed by this power of phenomenon. The rapidly increasing internet and computing powers have made a large volume of data, which is now more available than ever before. This has boosted the AI technologies. Between 2010-2015 the AI patents have been on rise, at 6% average yearly growth which is considerably higher than other patents.

By a report on AI of World Intellectual Property Organization (WIPO) South Korea, China, India haves seen a boom in AI patents between 2013-2016. China has significantly developed commercial AI capabilities like Baidu (a searching platform like Google), Alibaba (an e-commerce web portal like Amazon) and Tencent. WIPO has also showed a report where AI patents of Machine learning, deep learning and neural networks has the largest numbers I'm the patents. According to WIPO between 2000-2015 one in every five patents have been featured by the European countries and USA, Japan and China together has almost 78% of the total AI related fillings.

AI can potentially play a significant role in the economic impact. A research of PricewaterouseCoopers (Pwc) estimates that global GDP may Increase up to 14% (approx US$15.7 trillion) by 2030 as a result of development and acceleration of AI. So AI can be used as the most powerful, strategic technology of the 21st century.

Literature Review

In this part of the paper we would be reviewing literature on AI in Relation to international trade and economics. From the study of Meltzer (2018) we got to know that due to lack of global access to data there is a reduced barrier of AI in trade in areas like data analytics and translation services. People like Goldfard and Trefler (2018), Brynjolfsson Huiandliuy (2018) are some of the latest studies on machine learning of AI.

From Goldfard and Trefler(2018) we got an idea about the internationals dimensions of the economics of AI. It is solely a discussion per on policy implications on the international dimensions. It has explored and discussed the features of an appropriate model of international trade in respect to AI. The trade theory has emphasizes the role of scale, knowledge creation, competition as fundamental to comparative advantage. We address the gap in this study by testing how many economics theory of AI can be applied on its effects of trade.

The study of Brynjolfsson, hui and liuy (2018) had many limitations but it was the first imperial study of AI. We have studied The study of Brynjolfsson, hui and liuy (2018) and concluded that it can be improvised in these ways:

1. They only used a particular internet platform, Ebay. This limited the information as they could only operate within 27 countries not the whole world

2. In their work they concluded that language barriers significantly hinders trade. But with the inauguration of neural machine, that may no longer be the case

Review of the study of European Parliament.

From the study of, European Parliament we can get a vast idea about the economic impact of ai. It has described about how AI can definitely change the economic growth just by applying it greatly. It has somewhat warned us about the huge gap it can make between developed and developing countries. The study has also warned about its potential to increase unemployment, inequality, pushdown of wages and shrink the tax base.

Data and Methodology

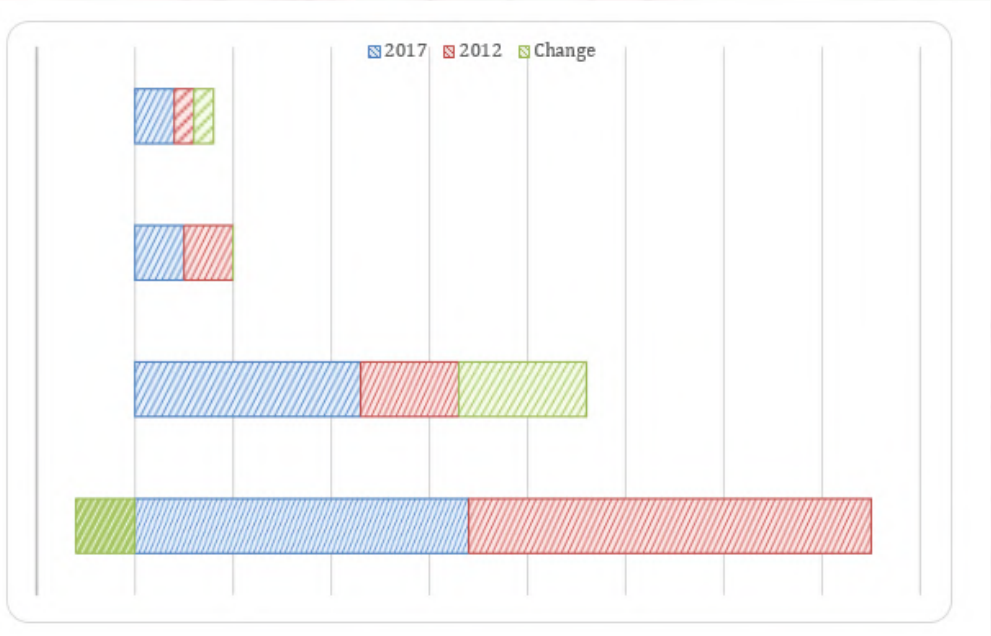
Data of the basic research articles, patents citations produced in a region, the number of start-ups established in a region can be used a tracking method of using AI in different regions. We have collected data about the participation of different economists with their major AI research works namely Association for the Advancements of Artificial Intelligence (AAAI). In the table mentioned below we have shown the participation percentage of different countries in 2012 and 2017

TABLE1: Countries Participants at a major AI conference

COUNTRIES	2017	2012	CHANGE
U.S.	34%	40%	-6%
China	23%	10%	13%
U.K.	5 %	5%	0%
Singapore	4 %	2%	2%
Japan	4 %	3%	1%
Australia	3 %	6%	-3%
Canada	3%	5%	-2%
India	3%	2%	1%
France	2%	4%	-2%
Israel	2%	4%	-2%
Italy	2%	2%	0%
Others	10 %	10%	0%

Note: this is the statistics of papers presented by different countries at a major AI conference in 2017 and 2012

Source: PWC (2017)



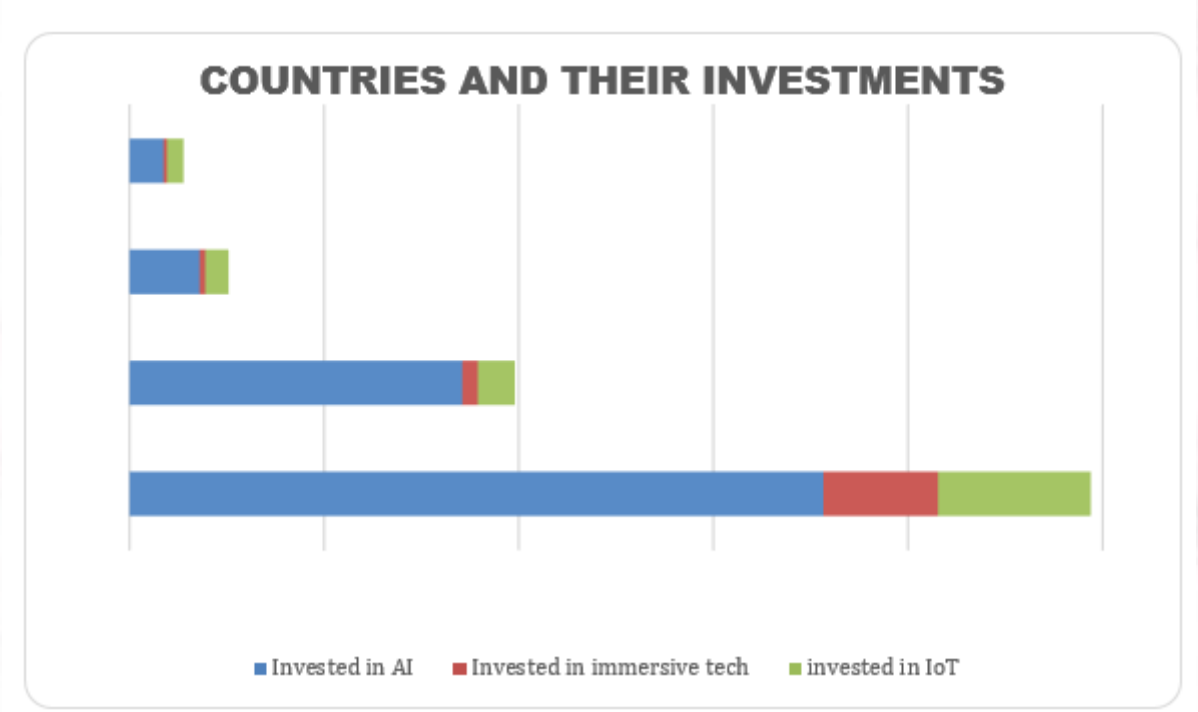
We have analysed the recent data from DIGITAL FUTURE INDEX which ranked countries on the basis of their investment on technologies including AI, Immersive Technology, Block chain and Internet of Things (IoT)

TABLE 2:

	Countries investing most in artificial intelligence	**Countries investing most in immersive tech**	**Countries investing most in internet of things tech**	**Countries investing most in distributed ledger tech**
#1	**USA** – £71.3 billion	**USA** – £11.8 billion	**USA** – £15.7 billion	**USA** – £8.9 billion
#2	**China** – £34.2 billion	**China** – £1.6 billion	**China** – £3.8 billion	**UK** – £1.6 billion
#3	**UK** – £7.2 billion	**UK** – £592 million	**Japan** – £2.4 billion	**China** – £1.5 billion
#4	**Israel** – £3.5 billion	**Israel** – £338 million	**UK** – £1.7 billion	**Switzerland** – £967 million
#5	**Canada** – £3.1 billion	**Switzerland** – £329 million	**Israel** – £805 million	**Singapore** – £850 million

Source: https://www.romaniajournal.ro/business/which-countries-are-investing-most-in-digital-technologies/

NOTE: This table shows the top 5 countries invested in AI, Immersive Technology, Block chain and Internet of Things (IoT)



USA has significantly invested a lot more compared to other countries. It is the leading country investing the most amount of money in every category worldwide. USA's total investment in AI has surpassed £71 billion in total up-to-date.

In second place China has also invested a huge amount of money, more than £34 billion in digital technology majorly in AI and is the second most invested country

UK ranks third worldwide and first in Europe. UK has estimate spent £10.4 billion in digital technology (most in AI, £1.3 billion).

Israel ranks fourth for AI and Immersive Tech (I.e. virtual reality) globally, and fifth for IoT tech (technology that connects to the internet). Switzerland ranks fourth for DLT (i.e. Blockchain) and fifth for Immersive Tech.

Analysis

In this part of the paper we can conclude that USA and China are heading to be absolute super powers in the AI business. India might be lagging behind from them in the AI business but we have been seeing a rapid increase in the service trade sector.

● Artificial Intelligence is one of the many emerging and enabling technologies that have abroad implications across all aspects of society by reshaping the economy, national security and international trade.

● AI is projected to add estimated $14 trillion to global economy by 2030. The global AI market is projected to grow from an estimated $1five7 billion in 2020 to an estimated $300 billion in 2024 , with a CAGR of 17.1 percent

● AI software which is 80 of the current AI revenue which is estimated to have the slowest growth which is five years. it is said that AI hardware projects are to grow by 43 percent by CAGR in five years which is driven largely by the AI chips(fastest growing component). .

We can also get an indication about the economic future of AI from the investments made by different public companies .Table 3 shows 12 largest companies worldwide who has invested in AI among which 7 of the 12 companies have highly invested in AI like Microsoft, Amazon, Apple, Facebook, 3 of them are from finance where AI is rapidly rising and one has substantial pharmaceutical presence where AI will soon be developed. Table 3 is important for the international trade of AI as two of the largest companies; Tencent and Alibaba are now AI intensive firms.

TABLE 3: World's largest Public Companies and AI Exposure

COMPANY	MARKET VALUE	AI EXPOSURE
Apple	$754	HIGH
Alibaba	$269	HIGH
Amazon	$423	HIGH

Tencent Holdings	$272	HIGH
Alphabet	$579	HIGH
Microsoft	$509	HIGH
Facebook	$411	HIGH
Berkshire Hathaway	$411	RISING
Johnson and Johnson	$338	RISING
JPMorgan Chase	$314	RISING
Wells fargo	$279	RISING
ExxonMobil	$340	LOW

Sources: Goldfard and Trefler (2018)

Funding and Investments of Countries in AI

CHINA

China has always had high ambitions for becoming the superpower of the world in AI and it has already at a high position in AI research table. Moreover the State Council of the People's Republic of China has declared to become$10billion AI global leaders by 2030. The high population among which approximately 750 million internet users have benefited China to get a huge supply of digital data and brought a huge benefit to the country. The country has also published a huge number of research papers. According to a PwC survey, over 47% of CEOs in China surveyed reported that there are some forms of AI initiatives currently in place in their organizations, compared with 42% globally. On the other side, 39% of executives said they have plans to introduce AI initiatives in their organization in the next three years, 4% higher than their global counterparts.

USA

USA is also becoming a AI superpower as the country has already being benefited by $10 billion in venture capital channelling in the direction of AI. Due to the recent activities in the country like reducing funds in AI, acceleration in education cost and strict immigration restriction has led to a decline and unclear future of AI. U.S. has continued to climb, jumping from 48% in 2018 to 72% in 2019. According to the report, 54% of respondents reported that AI helped their team in optimizing systems and lessening costs. On the other side, 28% of businesses that are aware of AI but not using it cited budget constraints as the primary reason, followed by lack of technical expertise (36%), unproven ROI (30%), and lack of C-suite or Board buy-in (16%).

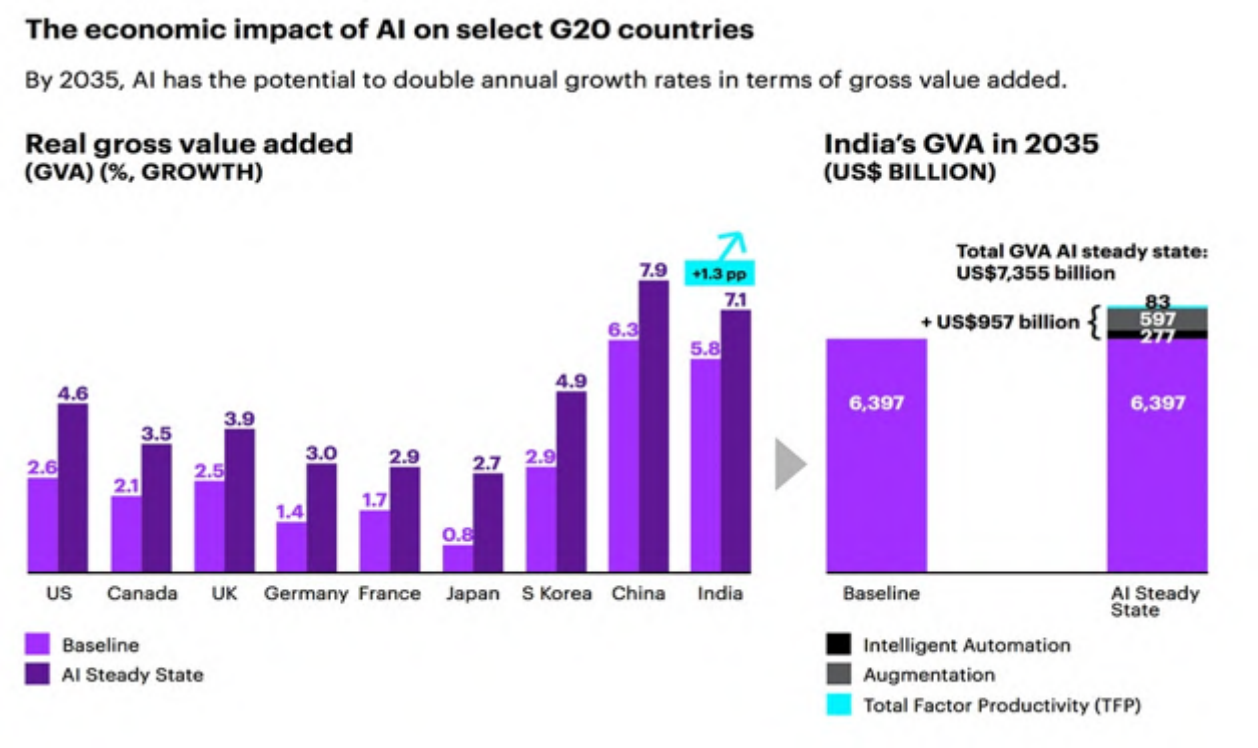
CANADA

In March 2017, he Canadian government declared a commitment to make the country a $125 million investment in AI research. The government plays an important role in investing the AI projects

INDIA

India is a fast-growing and developing nation, going through a lot of transformation in its digital space. The impact of technology like artificial intelligence (AI) in the country can be measured from the influence of digital technologies on the economic elements and GDP which is 8 percent. The percentage is expected to increase to 60 percent in the next two years. However, any budget allocation has not been provided by the Indian administration yet the country is determined to lead the AI race by embracing a number of AI initiatives. According to a joint survey conducted by NASSCOM and EY, around 60% of the corporate leaders in India realized the growing importance of AI and the need to adopt it. Although 70% of enterprises that have deployed AI are said to have achieved measurable benefits, the AI adoption rate is still low in the country. Only 25% of the Indian enterprises have deployed AI solutions, while a majority of business leaders

believed that AI will disrupt their businesses within the next three years.



From table 4 we can also consider the export and import of service goods (the invisible trade) then we get an estimate of balance of invisible trade of India during the concerned period.

Table 4 shows that the deficit in India's Balance of Trade (BoT) increased gradually over the last 7 decades

TABLE 4 - Visible and Invisible Trade of India and Current Account Balance during 1951-2021 (Value in Rs. Crore)

Year/Plan Period	BoT (Rs.)	Balance of Invisible Trade (Rs.)	Balance of Current A/C of BoP (Rs.)
First FYP (1951-56)	(-)542	(+)500	(-)42
Second FYP (1956-61)	(-)2,339	(+)614	(-)1,725
Third FYP (1961-66)	(-)2,382	(+)431	(-)1,951
Fourth FYP (1969-74)	(-)1,564	(+)1,664	(+)100
Fifth FYP (1974-79)	(-)3,179	(+)6,221	(+)3,082
Sixth FYP (1980-85)	(-)23,580	(+)16,758	(-)11,822
Seventh FYP (1985-90)	(-)38,715	(+)15,886	(-)22,829
Eighth FYP (1992-97)	(-)1,47,212	(+)87,668	(-)59,524
Ninth FYP (1997-2002)	(-)3,16,445	(+)2,53,730	(-)62,715
Tenth FYP (2002-07)	(-)7,82,788	(+)7,76,177	(-)6,611
Eleventh FYP (2007-12)	(-)29,67,631	(+)20,01,225	(-)9,66,406
Twelfth FYP (2012-17)	(-)43,01,910	(+)33,68,409	(-)9,33,501
Thirteenth FYP (2017-22)*	(-)47,16,205	(+)39,88,546	(-)7,27,659

Source: Economic Survey, Govt. of India

As we can clearly observe from the Table 4 that India already has been excelling in the invisible trade sector, and from there we can conclude AI in a large scale would be profitable for India. Even though the Indian government raised their investments in Digital India to $477millions in 2020 to boost AI, IoT, machine learning and robotics but still nowhere near the other governments those who are leading in AI. For example Canada, USA, China.

CONCLUSION

On the basis of our study we can conclude that AI is boosting the economy of some of the world powers like USA and China. In the case of India, we are in the competition but there is a plenty of room for improvement. We have seen that over decades that trade (export) through agriculture and industry has fallen gradually. On the other hand service trade has risen to a great extent. Through our study we have seen that service trade is playing a great role in minimizing the negative value of Balance of Trade. The rise of AI decision-making, in everything from cars to media to business processes, challenges regulatory capacity. Governments must regulate AI in order to further traditional regulatory goals, such as consumer protection, privacy, and law enforcement. Governments can, however, craft or enforce AI rules that disfavour foreign enterprises. The regulation of AI should not be used to create yet another behind-the-border trade barrier.

Throughout the world, many countries have a diplomatic stand on AI and its role in boosting the economy. Some of the countries have a stand that though AI is all about service trade and there is no materialistic exchange thus, even though it is boosting the economy instantly over a short period of time, it is not beneficial for long run.

Thus the Indian Government should focus more on AI, keeping an eye on all the pros it is providing to our economy.

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