Digital Dynamics and International Trade: Experiences of South and South-East Asia

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ABSTRACT

The digital duo of the internet and mobile brought a sea change in production, economics, and marketing structures along with trade. A world that is not time and space-bound eased business and commerce by extending the time of operation and eliminating the geographical boundary that led to a boost in worldwide trade. Here, the impressive performance of the South and Southeast Asia regarding e-commerce earns a special mention. The article considers 18 countries (Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam) belonging to South and South-East Asia along with China for six years (2009-2014) and opts for a panel data analysis to determine the impact of digitalization on international trade. The findings point to the fact that digitalization has a positive and statistically significant impact on trade volume.

KEYWORDS

Broadband, Digitalisation, Impact Analysis, International Trade, Mobile Phones, Panel Data, South Asia, South-East Asia

1. INTRODUCTION

A change in trade regime always precedes a change in the mode of production. The Fordist mode of production that introduced the world with the assembly line mode of production dominated the world for more than seventy years. However, it was augmented by cheaper availability of information at the end of the eighties of the last millennium, following the microelectronic revolution and a deregulatory regime that was paved by the Uruguay round and GATT negotiations (Goddard & Gillespie, 1986; Garnham, 1990; Hepworth, 1989). Harvey (1989, 1990) illustrated it as time-space convergence, and Poster (1990) moved a step forward to portray it as an electronic revolution that changed both what to know and how do we know that. This sudden emergence of and shift to an informational mode of production (Castells, 1992) succeeded a series of crisis that started with the fall of the Bretton-Wood system and Japanese automobile companies’ discovery of the US market, that marked the end of worldwide industrial hegemony of USA (United States of America).

Further to this, the worldwide transition from fixed to floating exchange rates and the Organisation of petroleum-producing countries’ (OPEC) crisis from 1973 to 1980, which released $375 billion Petro-dollars and threw the West into the cocoon of a recession and stagflation, may be considered
as some of those evil necessities. Debt dependence of the third world went to an all-time high, and depending upon debt instead of equity became a usual trend (Corbridge, 1984). On the other side of the Pacific, a war-devastated Japan restructured itself and became the new financial pivot of the world (Vogel, 1986), and the Euro market flourished more than ever before (Pecchioli, 1983; Walter, 1988). All these further molded by the weakening of the historically industrialized nations such as the USA and UK (United Kingdom), and the concurrent rise of Japan from Asia, and Germany from Europe, to fill that gap. The role of the Thatcherite and Reaganite administration towards these transformations deserves special attention. Computerization of commerce and production brought parity in their operation, and that reduced the inventory cost to a great extent through the ‘in the time inventory system.’ The agents of modern production, commerce, and trade, the multinational corporations, showed great flexibility to explore and operate beyond the existing boundaries of time and space. Their success ushered in the change from state monopolies to Globalization (Graham et al., 1988). Finally, the titan of state monopoly, Soviet Russia inclusive of the Soviet bloc faltered and put the final nail on the coffin of the static world to embrace dynamism. All these would have been fruitless without the integration of the global financial system, but the aforementioned revolutionary changes in the global telecommunication system facilitated such integration (Marshall, 1987). The stage was ready for the redefining of the Ricardian comparative advantage, and the precondition of such a significant change is to implement the contemporary shift in data regime together with amplified telecommunication capability (Gillespie and Williams, 1988). By this time, the changes of data from analog to digital, made computer service, and telecommunication complementary to each other.

Further, the private players assumed the role of a viral force in global telecommunication. The United Nations (UN) realized the importance of this new viral force and announced the formation of the Integrated Service Digital Network (ISDN) to bring parity among its member nations regarding the technological changes associated with telecommunications. ISDN was facilitated by the US placed fibre-optic cable network that was spreading quickly around the world, primarily to bring in parity and more symmetry in the global information system (Warf, 1995).

Telephonic communication through fixed lines was a popular form of business and personal communication; however, it was subject to a spatial barrier. It was a useful communication tool that was static in terms of space but dynamic in terms of time (Brewster, 1994). The introduction broke this spatial barrier of mobile phones that turned telephonic or mobile communication dynamic in terms of both time and space. This transformation from landline to Mobile is known as the digital divide (Heather, Miller and Miller, 2006). The first proto-type mobile came into origin long back in 1973, and ten years later, it became available in the market. However, it took another 17 years and the commencement of the new millennium to be in its current shape both in terms of accessibility and usefulness (Tiong et al., 2012). Conjugation of Mobile with broadband in this new millennium turned it into a millennium of mobiles (Regazzi, 2018). The first time the Internet became mobile both in terms of time and space, and so did information as a corollary.

The coupling of Mobile and broadband or the Internet has transformed the business, resulting in savings in accounting and opportunity costs in international trade. Manyika et al. (2015) that use of RFID had reduced the transit cost for BMW by 11-14 percent and echoed by Lund and Manyika (2016) “Conducting cross-border business on a digital platform like eBay can reduce transaction costs by 64 percent” (Lund and Manyika 2016,5), making the market more competitive in a ‘Pareto Optimal’ way and converting the entire trade process more simplified.

These three elements together gave birth of a new breed of entrepreneurs who might be termed as digital entrepreneurs and that obviously created employment that was much needed with an ever-growing world population. Since financial transactions are very basic pre-conditions of International trade, this can be argued that it is one of the most benefitted aspects after this dual digitalisation. The problems associated with financial transactions with the remote countries before this digitalisation were hard to address and used to take much longer time to complete the cycle. This eventually gave rise to trust issues, late realisation of profit and obviously delayed reinvestment of capital for
further expansion of trade. With digitalisation and further amalgamation of the same with the help of mobile as mobile became synonymous to internet, the time taken to complete the transactions reduced significantly.

The problem of staying far away from the trade partner is no longer acute. Communication has become cheaper as well as much more convenient. It seems to encourage even the smaller countries to involve herself more in international trade. The virtual marketplace is the reality of today. It is very evident that people with internet connectivity on their computer and mobile phones frequently purchase on the internet through different online stores like Amazon and Flip cart and many more. Different convenient mobile applications offered by these online stores seem to instigate people to purchase more because the opportunity to observe merchandise and comparing all possible options offered by different online stores and then purchase those with some clicks on the buttons increase the probability of impulse purchase. The phenomenal increase in the digital connectivity enables today’s consumers to see and compare between the products offered by the domestic and foreign companies, which was not the case before this digital revolution. Now, the chance to see the merchandise offered by foreign companies and the opportunity to purchase those sitting in the comfort of home seem to increase the propensity to purchase more merchandise offered by foreign companies than before. Any merchandise purchased from outside the country through online stores adds to the value of import of a country and export of another. This can be assumed looking at this reality that digital connectivity will enhance the volume of trade. In a very recent article Janow and Mavroidis (2019) declares “The digitalization of trade is a reality” (Janow and Mavroidis, 2019, 1)

At this background the present paper considers a panel data of eighteen countries belonging to South and South-East Asia to investigate and validate the relation between international trade and mobile subscriptions if any. It is worth mentioning that access to mobile is much easier than access to desktop or laptop. Further to this unlike being online through desktop or laptop mobile breaks the spatial barrier where a consumer and producer can still be in touch in a virtual market place while on move.

The current paper started with an introduction followed by an exhaustive and critical review of relevant literature, then it gives a brief status of current digital trade that also justifies the region under study. It succeeds with a theoretical background on the trade and cell phone interaction where producer and consumer spiral become apparent. It is followed by methodology and econometric analysis before ending with a conclusion.

The main objective of the paper is to investigate the impact of mobile phone and broad band penetration on International trade for South and South East Asian countries

2. LITERATURE REVIEW

International trade has a strong literature backing the conventional determinants of international trade, however, with time and following digitalisation other variables have evolved that impact trade as well. The present literature review drives away from the literature that illustrates the conventional determinants of international trade and focuses on the literature that illustrates impact of digitalisation, specifically mobile phones on international trade.

2.1 Digitalisation and International Trade: As Evidenced in Existing, Literature

This section illustrates the digitalisation and international trade interaction. Bristol et al. (2001) resorted to a static microeconomic approach in their study on Caribbean island. While measuring the impact of digitalisation on tax revenue, he opined that in the export market the volume of traditionally imported goods and services would increase given that the current trend of growth of e-commerce continued in the island. Onyelwu (2002) mentioned that trade might also impact internet access positively. Advanced technological products imported from developed countries might provide a learning opportunity to the developing and least developed countries. Such change might be a dual function of learning by doing
and sudden innovation. Freund and Weinhold (2004) in their paper quantified the impact of internet on exports. They showed that a 10 percent increase in internet access led to a 0.2 percent increase in exports. Further to this, they indicated that such growth was inversely proportional to distance, though internet did not have any direct causality with the same. Marcella and Davis (2004) highlighted the three types of marketing model that were built using internet namely the representative model, the online community model and the virtual business model. Elaboration of their findings and parallel comparison with today’s world emphasized that the last two models were most important from the point of view of today’s business and trade world. Online community model provides the customer real life experiences without being a part of the real life and that often results in ‘bandwagon effect’. The virtual business model literally runs the online business today; examples are many a few to refer are Amazon, Flip cart, Freelancer.com. Bhavnani et al. (2008) expressed that mobile phones could be a powerful tool to eradicate poverty in rural areas and that mainly happened through trade over mobile phone. They cited the case of Odessa sea port of Ukraine where mobile phones became a determinant in setting up of prices and in expansion of market for the local fishermen. Further to this the same happened in Kerala state of India. Referring Jensen (2007) they stated “The survey of 300 sardine fishing units was conducted every Tuesday, from September 3, 1996 to May 29, 2001. Data on amount of fish caught, costs of operation, sale conditions (market, price, quantity, time, etc.), weather conditions and whether they used a mobile phone were obtained. The survey found that phones were bought by the largest boats first as they could get the largest possible arbitrage gains and could afford the $100 phones. This study concluded that the use of mobile phones (a) increased consumer surplus (by an average of 6%), (b) increased the fishermen’s profits (by an average of 8%) (c) reduced price dispersion (by a decline of 4%) and reduced waste (which was averaging 5-8% of daily catch, before the use of mobile phones)” (Bhavnani et al., 2008, 16). Apart from these broad heads mentioned above, mobile phones are capable of expanding the market and businesses, getting rid of market inefficiencies, increasing the consumer surplus and also decreasing the need of transport especially in remote places. Moreover, mobile phones also offer indirect and intangible benefits like disaster relief and many others. All these together definitely boost trade and makes it more sustainable. Mejers (2014) had found very strong positive association between international trade and internet access and internet and mobile becoming complementary nowadays, the above reasoning definitely has merit.

Shaikh and Karjaluoto (2015) took up an exhaustive study of literature related with mobile banking and opined that e-commerce would continue to have a great impact on global business. Ling and Typhina (2016) made an interesting observation regarding mobile apps. In their words “A high mobility and high context app would allow someone to play a locative game of hide-and-seek with their friend, while a low mobility and low context app would consist of someone checking the hours of a local business before leaving home.” (Ling and Typhina, 2016, 28). Abeliinsky and Hilbert (2017) showed in their article that effect of information and communication technology on the pattern of global trade in terms of the differential impact on the bilateral trade. They defined the quantity of telecommunication in terms of number of subscriptions for telecommunication and the quality of telecommunication in terms of the speed of bandwidth per subscription. This study was carried out for internet services, fixed and mobile phones. They have used augmented gravity model and a regression analysis of 122 countries over the period of 13 years from 1995 to 2008. The result revealed that the quality of telecommunication mattered most in case of developing countries and the quantity of telecommunication was more relevant for developed countries. González & Jouanjean (2017) described digitalisation as a changing agent by assuring greater physical trade transcending from digital delivery with the help of better digital connectivity. They argued that the proliferation of internet platform ensured more trade across borders and new technologies changed the ways of service production and delivery. Practitioners of the trade put in efforts to realise how this digital transformation was giving and going to give a new shape to the international trade. It was also argued in this paper that digital trade could not be confined to a single definition. There is growing acceptability that all the transactions in trade in goods and services, which are digitally enabled
and facilitate physical digital delivery among firms, consumers and governments, come under the
digital trade. Maiti & Kayal (2017) argued in their paper in the context of India that the revolution in
the information and communication technology had significant contribution in the enhancement of
service sector, especially the financial sector in India by the year 2012-2013. The service sector share
to India’s GDP was 56 percent in 2013-14. Since service sector contributes largely to international
trade, the boom of the service sector had a positive impact on international trade.

It is apparent from the above discussion that digitalisation with the advent of internet and mobile
phone has given birth of a new form of trade popularly known as digital trade. Further to this, the
expansion of the base of the definition is now qualifying many kinds of trade as digital trade and in
near future that base will widen further.

2.2 Mobile Phones and Internet: Complementarity

Mobile phones and internet have become synonymous nowadays. Specially with the advent of many
user-friendly apps (applications) geared towards market and trade such as amazon.com, flipcart.
com etc, the mobile has become a mobile market that can be accessed from anywhere and at any
time. Osibanjo and Nonrom (2008) highlighted the phenomenal growth of mobile users and sharp
decline in landline users in Nigeria, one of the fastest growing telecom markets of the world. In their
words “The country’s tele density increased from a mere 0.4 in 1999 to 10 in 2005…More than 25
million new digital mobile lines have been connected by June 2006…Consequently, the contribution
of fixed lines decreased from about 95% in year 2000 to less than 10% in March 2005” (Osibanjo
and Nonrom, 2008, 1). They have suggested that adequate caution needs to be taken while opting
for second hand and recycled mobile. They have also opined such import was necessary to bridge
the gap of digital divide but a proper trade off should be followed. Meltzer (2014) mentioned about
the complementarity of mobile phones and internet especially in developing countries’ “Internet
access. Indeed, mobile phones are now the main way that people in developing countries get online.
Challenges to expanding such Internet access include the costs of Internet-enabled smart phones and
the costs of mobile broadband plans. For instance, by 2018, 54% of mobile devices in the developing
world will be “smart” compared with 93% of US mobile devices” (Meltzer, 2014, 9)

Consideration of the above literature also highlights that no holistic attempt has been made
to gauge the impact of mobile subscription on international trade. However, almost all the authors
under consideration have agreed directly or indirectly that digitalisation and mobile revolution are
the new propelling factor of global trade. The following section illustrates the complementarity
of mobile phones and internet.

3. DIGITAL TRADE AND MOBILE BROADBAND,SOME STATISTICAL PROOFS.

According to one of the estimates the online international trade was around $105 billion in 2013
(PayPal, 2013). This upsurge is often associated with the growth of the middle class. Hatch (2018)
mentioned “In 2017, ecommerce was responsible for around $2.3 trillion in sales and is expected to
hit $4.5 trillion in 2021” (Hatch, 2018).Further to this “In the US alone, ecommerce represents almost
10% of retail sales and that number is expected to grow by nearly 15% each year!” (Hatch, 2018).
Moreover, internet has also paved the way for the Small and Medium Businesses (SMBs) to engage
in international trade. More than 95 percent of the USA SMBs are using eBay as a business platform.
Among these SMBs more than 74 percent were still operating in 2015 (eBay, 2015). As mentioned by
UNCTAD B2B commerce in 2013 accounted for about 95 percent of total $16.5 trillion e-commerce
(UNCTAD, 2015). The growing impact and use of internet in conjugation of mobile phones may also
be realised from the fact that that in 2015 YouTube had more than one billion users and 50 percent
of YouTube views comes through a mobile device. The spread might be gauged from the fact that 88
percent of YouTube traffic was generated beyond USA (You Tube, 2015).
Not only the developed countries such as USA but the developing countries could enlist themselves as one of the major beneficiaries of internet. As per the World Bank report business belonging to developing countries may mobilise around $96 billion by 2025 (World Bank, 2013, 43).

Porges and Enders (2016) highlighted that “Internet-generated share of B2B shipments/sales/revenues as 57 percent for manufacturing, 26.5 percent for merchant wholesalers, and only 3.5 percent for services” (Porges and Enders, 2016, 2). Further to this they also mentioned that online selling both within the border and across the border by US firms amounted to “US$935.2 billion in products and services online in 2012 — roughly equivalent to 6.3 percent of US gross domestic product (GDP) — including US$222.9 billion in exports.” (Porges and Enders, 2016, 2). Again, the authors mentioned that “US firms in digitally intensive industries purchased US$471.4 billion in products and services online in 2012, including US$106.2 billion in imports, implying a net surplus on digital trade” (Porges and Enders 2016, 3). Furthermore, they highlighted that “in 2015, global mobile broadband penetration reached 47 percent, with some 3.5 billion mobile broadband subscriptions and 800 million fixed-line subscriptions” (Porges and Enders, 2016, 3). The mobile internet network is outplaying the fixed internet network as there is no or little spatial barrier. The authors moved forward to mention further that the app economy through mobile is becoming a viral force over the time as users of internet spend more than half of their time online, using apps. If we swim away from the conventional selling of products to online, users of certain digital platforms such as Facebook, Google search will unleash a huge volume of fresh consumer “1.4 billion users for Facebook, 83 percent of which are outside the US and Canada (but blocked in China); more than 1 billion users for Google search; and more than 1 billion YouTube users in 61 languages” (Porges and Enders, 2016, 3). It is evident this massive online savvy population hold much untapped potential.

Lund and Manyika (2016) mentioned in their research paper that “Between 2002 and 2012, cross-border Internet traffic grew by 60 percent a year. This reflects both an increase in the number of Internet users around the world and a sevenfold increase in cross-border Internet usage. By 2025, on conservative assumptions, we estimate cross-border Internet traffic could grow another eightfold” (Lund and Manyika, 2016, 1). The authors commented that “surplus from the US and Europe alone is close to €250 billion (US$266.4 billion) each year” (Lund and Manyika, 2016, 4). In a global scale “The result has been an explosion in e-commerce. Global e-commerce sales reached over US$1.3 trillion in 2014 — nearly 2 percent of global GDP. While a majority of e-commerce sales are within a country, a growing share is cross-border. About 40 percent of Amazon’s net sales in 2014 came from sales outside of North America. Alibaba, the leading e-commerce platform in China that includes marketplaces for business to business (B2B), business to consumer (B2C), and peer to peer (P2P) e-commerce, posted gross merchandise value of US$370 billion in 2014, larger than Amazon and eBay combined.” (Lund and Manyika, 2016, 5).

The developing world is also experiencing the fruits of digital trade. South-East Asia has been spectacular in this regard. In 1990 trade as a percentage of regional gross domestic products stood at 70 percent that increased to 93 percent in 2015. It is worth mentioning that such growth excludes the extremely trade oriented Singapore. “In 2016 and 2017, retail sales are estimated to have grown at 64.3 percent and 55.3 percent, respectively, in Indonesia, 21 percent and 22.6 percent respectively in Malaysia, 27.3 percent and 25 percent respectively in the Philippines, 15.2 and 14 percent respectively in Singapore, 20.7 percent and 19.5 percent respectively in Thailand, and 24.3 percent and 22 percent respectively in Vietnam” (Suominen, 2017). Such phenomenal holistic growth in e-commerce all over the region reaching up to almost half of the global e-commerce trade has turned the Asia-Pacific region into the global centre for e-commerce. It is expected that by next decade the online subscribers in ASEAN will grow by three folds. Digitalisation has also made trade a more level playing field for the SMEs. SMEs that use web as a medium to sell their product are 50 percent more likely to end up in success than those opting for traditional forms. These firms mostly opt for multimeter operations that reduce the risk of single market operation. “100 percent of Thai online sellers export, on an average, to 46 markets and in Indonesia, 100 percent of eBay sellers export to
34 markets” (Suominen, 2017, 4). Further to this the growth rate of these sellers are much more than the economic growth rate of the country “The average compound annual growth rate of these sellers in 2011 to 2015 was 6 percent in Thailand and 11 percent in Indonesia—well above these countries’ economic growth rates (3 and 5.5 percent, respectively) during the period” (Suominen, 2017, 4). More interestingly the survival probability of the online sellers after the first year of operation is 80 percent much more than the mere 33 percent of offline sellers (Suominen, 2017).

Suominen (2017) mentioned that international parcel flow has increased by 73 percent, almost seven times faster than the global trade over the period 2011 to 2015. Over the same time frame, intraregional parcel flow in ASEAN region increased by 140 percent (Suominen, 2017, 5). Further to this the boost in service sector following digital trade cannot be ignored at all. “Developing countries increased their exports of commercial services from 25 percent to 32 percent of global services exports between 2006 to 2015” (Suominen, 2017, 5). A software company Fresh Desk in India had only two employees in 2010 that grew to 900 by 2017. The concerned company now helps more than 1 lakh companies over the world to deliver a better consumer experience (Suominen, 2017).

It is apparent from the above discussion that the International trade all over the world is going through a positive transformation owing to the conjugation of mobile and internet. Further to this the performance of ASEAN and Asia-pacific region is spectacular in this regard. In the wake of Bay of Bengal Initiative for Multi-sectoral Technical and Economic cooperation (BIMSTEC) which highlights the prospect of unification of South and South-East Asia, the forthcoming econometric analysis has chosen the mentioned region to investigate the impact of mobile subscription on International trade. Before endeavouring into this an interesting contrast between the two regions might be important to take note of as mentioned by Chatterjee and Banerjee (2018) “South Asia contributes to only 2.26% of the total global trade volume. Worse, the intra-regional trade is in an even sorrier state – the intra-regional trade volume as a percentage of the region’s trade with the rest of the world stands at a low 1.46%. In sharp contrast, the ASEAN contributes to 6.5% of the total global goods trade volume, which is much higher than the contribution to global trade volume by the SAARC nations. Moreover, the intraregional trade volume of the ASEAN constitutes 12.33% of its trade volume with the rest of the world. A close consideration of the overseas investment behaviour of the biggest nation of BIMSTEC, India, reveals the urge of the concerned country to spread out and interact with the ASEAN nations. Whereas Indian overseas investment in BIMSTEC nations for the month of October 2017 was only 1.29%, the same for ASEAN nations was almost ten times higher” (Chatterjee and Banerjee 2018, 3-4)

The above discussion gives enough reason to concentrate our study on countries belonging to South and South East Asia. Further it is apparent that no attempt has been made so far to gauge the impact of mobile phones and broadband connections on international trade. However, before moving to an empirical analysis a theoretical background has been provided in the next section.

4. INTERNATIONAL TRADE AND MOBILE PHONES, PROPOSED THEORETICAL BACKGROUND

In this section theoretical underpinning of the proposed impact of mobile phones on international trade has been provided. It may be said that digitalisation brought change in the mode of production and led to a production influx. The tool which facilitates the process of digitalisation and connects us to the rest of the world even while moving is mobile phone. The increased demand for mobile phone because of its capability to provide both the consumers and producers with the option to explore, compare, and take the optimal decision, paradigm shift in communication, increased competition in the cellular phone market that brought the price of cell phones turned it from luxury to necessity.

Moreover, owing to cheap labour cost, the production bases of many multinational companies were shifted to labour abundant countries where the choice of technique was mostly labour intensive. In this manner higher production led to higher employment and higher employment translated into higher sum of income. Following the golden rule of thumb of economics, this would definitely boost
the aggregate demand. Courting this production rise followed by the rise in aggregate demand, the conventional economy came at a juncture, where the increased production was looking for new market and increased aggregate demand was looking for added products. At this juncture, different online stores like Amazon, Flipcart, Alibaba presented to the consumers a huge array of products which took the consumerism to an unprecedented level.

If rise in production positively influenced the exports, then the rise in consumerism might have increased the imports with cell phones as a positive catalyst to this change. However, there were more factors to consider. If we consider the trade procedure there was a sea change. The digital duo gave new avenues of trade transaction that involved less financial and opportunity cost. More importantly, it opened a market that operates for 24 hours a day and 365 days a year. So increased production, rise in aggregate demand, and longer business hours have boosted international trade.

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The developing world is also experiencing the fruits of digital trade. South-East Asia has been spectacular in this regard. In 1990 trade as a percentage of regional gross domestic products stood at 70 percent that increased to 93 percent in 2015. It is worth mentioning that such growth excludes the extremely trade oriented Singapore. “In 2016 and 2017, retail sales are estimated to have grown at 64.3 percent and 55.3 percent, respectively, in Indonesia, 21 percent and 22.6 percent respectively in Malaysia, 27.3 percent and 25 percent respectively in the Philippines, 15.2 and 14 percent respectively in Singapore, 20.7 percent and 19.5 percent respectively in Thailand, and 24.3 percent and 22 percent respectively in Vietnam” (Suominen, 2017, 3). Such phenomenal holistic growth in e-commerce all over the region reaching up to almost half of the global e-commerce trade has turned the Asia-Pacific region into the global centre for e-commerce. It is expected that by next decade the online subscribers in ASEAN will grow by three folds. Digitalisation has also made trade a more level playing field for the SMEs. SMEs that use web as a medium to sell their product are 50 percent more likely to end up in success than those opting for traditional forms. These firms mostly opt for multimarket operations that reduce the risk of single market operation. “100 percent of Thai online sellers export, on an average, to 46 markets and in Indonesia, 100 percent of eBay sellers export to 34 markets” (Suominen, 2017, 4). Further to this the growth rate of these sellers are much more than the economic growth rate of the country “The average compound annual growth rate of these sellers in 2011 to 2015 was 6 percent in Thailand and 11 percent in Indonesia—well above these countries’ economic growth rates (3 and 5.5 percent, respectively) during the period” (Suominen, 2017, 4). More interestingly the survival probability of the online sellers after the first year of operation is 80 percent much more than the mere 33 percent of offline sellers (Suominen, 2017).

Suominen (2017) mentioned that international parcel flow has increased by 73 percent, almost seven times faster than the global trade over the period 2011 to 2015. Over the same time frame, intraregional parcel flow in ASEAN region increased by 140 percent (Suominen, 2017, 5). Further to this the boost in service sector following digital trade cannot be ignored at all. “Developing countries increased their exports of commercial services from 25 percent to 32 percent of global services exports between 2006 to 2015” (Suominen, 2017, 5). A software company Fresh Desk in India had only two employees in 2010 that grew to 900 by 2017. The concerned company now helps more than 1 lakh companies over the world to deliver a better consumer experience (Suominen, 2017).

It is apparent from the above discussion that the International trade all over the world is going through a positive transformation owing to the conjugation of mobile and internet. Further to this the performance of ASEAN and Asia-pacific region is spectacular in this regard. In the wake of Bay of Bengal Initiative for Multi-sectoral Technical and Economic cooperation (BIMSTEC) which highlights the prospect of unification of South and South-East Asia, the forthcoming econometric analysis has chosen the mentioned region to investigate the impact of mobile subscription on International trade. Before endeavouring into this an interesting contrast between the two regions might be important to take note of as mentioned by Chatterjee and Banerjee (2018) “South Asia contributes to only 2.26%
of the total global trade volume. Worse, the intra-regional trade is in an even sorrier state—the intra-regional trade volume as a percentage of the region’s trade with the rest of the world stands at a low 1.46%. In sharp contrast, the ASEAN contributes to 6.5% of the total global goods trade volume, which is much higher than the contribution to global trade volume by the SAARC nations. Moreover, the intraregional trade volume of the ASEAN constitutes 12.33% of its trade volume with the rest of the world. A close consideration of the overseas investment behaviour of the biggest nation of BIMSTEC, India, reveals the urge of the concerned country to spread out and interact with the ASEAN nations. Whereas Indian overseas investment in BIMSTEC nations for the month of October 2017 was only 1.29%, the same for ASEAN nations was almost ten times higher” (Chatterjee and Banerjee 2018, 3-4).

The above discussion gives enough reason to concentrate our study on countries belonging to South and South East Asia.

6. METHODOLOGY

The present econometric analysis considers balanced panel data of 18 countries (Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam) encompassing South Asia, South-East Asia and China over six years (2009-2014) on per capita trade volume (pctv$_i$), per capita broadband penetration (pcb$_i$), per capita mobile subscription (pmss$_i$), per capita FDI inflow (pcfdi$_i$) and per capita employment (pcemp$_i$). Data on Trade Volume comes from WTO Trade Database (wto.org) covering both merchandise trade and trade in commercial services (BPM6); data on per capita mobile and broadband subscription collected from the World Development Indicator interactive database; and data on FDI inflow for countries considered from World Investment Reports for the year 2011 and 2017 (unctad.org). Further to this data of total employment and the total population of the mentioned 18 countries were collected from the World development indicator interactive database. The total population of each country acts as the denominator. The rest of the mentioned variables as separate numerators to avail them on a per-capita basis. Per-capita trade volume represented the dependent variable and the rest of the variables as independent variables. Per capita, FDI inflow, along with Per capita employment, have been taken to overcome the omitted variable bias. The analysis intends to estimate one regression equation as specified below through panel data analysis. If any statistically significant association is there between the dependent and the independent variables as specified, then it might be concluded that per capita broadband subscription, per capita mobile subscription, per capita FDI inflow, and per capita employment impact per capita trade volume. The selection of other variables such as per capita FDI inflow and per capita employment have been considered as FDI inflow has a direct impact on international trade and per capita employment enhances the purchasing power and there by international trade. Moreover, they have also helped to overcome the omitted variable bias and endogeneity problem.

China though does not belong to either South or South East Asia; however it has been kept in the analysis considering its immense impact on South and South East Asian Trade (non inclusion of any other countries like Japan, Taiwan or any other conforms to this objective). The time frame under consideration was set to turn the entire analysis into a short panel data analysis. Further to this, time frame after 2014 has not been considered as 2015 onwards China faced an economic turmoil and that can jeopardise the findings.

7. DATA ANALYSIS

The regression equation to be estimated is -

\[
pctv_i = a + b \cdot pcb_i + c \cdot pcfdi_i + d \cdot pmss_i + e \cdot pcemp_i + u_i, \text{ where; } i = 1, 2, 3 \ldots 18 \text{ and } t = 2009, 2010, \ldots 2014
\]
In the above equation, ‘a’ is the constant term, b, c, d, and e are the coefficients of \( p_{cb_{it}}, p_{cfdi_{it}}, p_{mss_{it}} \) and \( p_{cemp_{it}} \), respectively. \( u_{it} \) is the stochastic error term. Considering the panel structure of the data presence of multicollinearity, heteroscedasticity, autocorrelation, cross-sectional dependence among the residuals along with endogeneity cannot be ignored and have been tested.

As illustrated in Table I, according to the Wooldridge test for first-order autocorrelation (Wooldridge, 2002), the data has the first-order autocorrelation problem in error structure, but no multicollinearity. Greene test for group-wise heteroskedasticity (Greene, 2000) declares the presence of heteroskedasticity in the error structure of the panel data model. Again, the Pesaran test (Pesaran, 2004) for cross-sectional dependence finds the presence of cross-sectional dependence in the error structure of the model and that with a high level of average correlation across units. Moreover, the model does not suffer from any endogeneity, as reflected in Table I. Cameron and Trivedi (2005) mentioned that ignoring heterogeneity and correlation across units and over time might lead to biased statistical inference. Moreover, Chudik, Pesaran and Tosetti (2011) mentioned that if number of cross-sectional units (N) is much larger than the time units (T) then cross-sectional dependence should always be taken into account. Most recent studies with panel data address heteroskedastic and autocorrelation problems but cross-sectional correlation has been largely ignored (Ardizzi et al., 2014). In case Cross section dependence is for unobserved common factors that are uncorrelated with regressors, then FE or RE estimators might be considered and the standard errors might be corrected following Drisscoll and Kraay (1998) approach. However, if the unobserved common factors responsible for cross-sectional dependence are correlated with the regressors then Pesaran (2006) method should be used for estimation of the coefficients as Drisscoll and Kraay (1998) method would not work and FE and RE estimators would be biased and inconsistent (Hoyos and Sarafidis, 2006). However, if the relation (correlated or not correlated) among unobserved common factors and regressors is not known then the choice between Drisscoll and Kraay (1998) and Pesaran (2006) is dubious. Beck and Katz (1995) used Monte Carlo Simulation to explain and favour the use of ordinary least squares with panel corrected standard errors (PCSE) over more advanced FE and RE models as well as GLS estimators for panel datasets exhibiting both heteroskedasticity and cross-sectional dependence. Banerjee (2017) and Ardizzi et al. (2014) countering similar problem with the dataset also followed the method proposed by Beck and Katz (1995). Where, Banerjee (2017) opted for the original Beck

<table>
<thead>
<tr>
<th>Econometric test</th>
<th>Results</th>
<th>Stat</th>
<th>Prob</th>
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</thead>
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<tr>
<td>Multicollinearity: Variance inflation factors (vif)</td>
<td>2.65&gt;10</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Wooldridge test for autocorrelation</td>
<td>129.753</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>Modified Wald test for Heteroskedasticity</td>
<td>2.9e+07</td>
<td>0.0000</td>
<td></td>
</tr>
<tr>
<td>Pesaran test for Contemporaneous correlation</td>
<td>11.521 (FE) 2.031 (RE)</td>
<td>0.0000 (FE) 0.0423 (RE)</td>
<td></td>
</tr>
<tr>
<td>Average correlation across the units</td>
<td>0.579 (FE) 0.635 (RE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endogeneity test</td>
<td>1.93</td>
<td>0.06</td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed
and Katz method of analysis. Ardizzi et al. (2014) opted for Prais-Winsten (1954) regression to adjust for autocorrelation. Similar to Ardizzi et al. (2014) the present analysis has considered Prais-Winsten (1954) regression with PCSE to properly adjust for the standard errors.

As depicted in Table II, the coefficients of per capita broadband subscription and per capita FDI inflow are positive and statistically significant; however, per capita, the mobile subscription is negative and statistically insignificant. The coefficient of per capita employment is negative and statistically significant. Furthermore, the explanatory power of variation of the mentioned independent variables and the model as a whole is highly significant, as reflected through the adjusted $R^2$ and $F$ statistics are given in Table II. The per capita broadband subscription and per capita FDI inflow influence the per capita trade volume in a positive and statistically significant way. Better digital connectivity might have facilitated trade. Nowadays, trade through the Internet is a common phenomenon. Apps like Amazon and Flipkart are growing popular day by day, and both are dedicated to trade, whether it is domestic or international. Existing refund policy in case the customer is unsatisfied has boosted customer confidence to opt for digital markets. The busy schedule and fast-paced life have also encouraged them to consider virtual shopping over the physical one. Bandwagon Effect cannot be left alone as well, and there might be a significant level of peer influence on the consumer.

Further to this, per capita, the broadband subscription is an indicator of economic growth and development that also boost trade. The strange relationship between the per capita employment and trade volume follows the locus; with the rise in employment, people are more prone to opt for domestic goods mainly when foreign direct investment inflow has brought improved technology and the domestic producers taking advantage of the same are producing products as per the international quality. In other words, there is an import substitution effect led by the FDI inflow and reflected through the purchasing habit of domestic consumers. Moreover, as discussed in the literature review section, digitalization boosts domestic trade more than the international trade; however, the media that is the digital market remains the same for both kinds of trade.

### 8. CONCLUSION

The focus of the present article is on digitalization and its dynamics with international trade as might be experienced by select South and South Asian countries as well as China. The panel data analysis that comprised relevant data on 18 countries over six years depicts that broadband penetration has a positive and statistically significant impact on trade volume. It indeed portrays that digital trade is the new mantra of international trade as it saves opportunity costs regarding traveling to different shops.
or even a nearby shopping mall. It creates a two-dimensional virtual shopping place that is open for 24 hours a day, seven days a week, four weeks a month, and 12 months a year. It makes it possible that consumers and merchants alike from different time zones to interact as vibrant economic entities and that eventually boosts the digital trade.

Further to this, over time, the enactment of strict refund policies has established consumer faith in digital merchants. Innovative policies like free offers, discounts, and festival bonanzas have attracted consumers from every corner. There is no separate advertising cost as the visual impact of the digital market serves that purpose, unlike a real-life market place. We are living in a corporate world, and time is scarce; on the other hand, consumers are better informed than before, so they are prone to compare their products in a quick time. The digital market place is complimentary to both the causes, and that is propelling the digital trade like never before. The countries under consideration are developing or less developed. However, amidst Globalization, their consumers are also geared towards internationalization; this explains the dynamism between digitalization and international trade as experienced by the selected countries of South and Southeast Asia.

8.1 Practical Implications for Asian Business

Similar to the budget line, time itself is another constraint to consumption. In the present era, life has become a deadline, and all those deadlines should be met to remain relevant to society. In this background, people have little luxury to spend time in shops and malls. The footfall of malls is mainly from young people and elites who are capable of providing the luxury of time. On the other hand, ordinary people who have similar needs of the market are blessed with the digital duo of Mobile and broadband. It does not mean that the young and the rich people venture into the digital market but necessity and luxury are two different things. A click of a finger on Mobile opens up a virtual market place that makes life easy both in terms of time and variety of items placed before us. Repeated amendments towards the refund policy towards the favor of the consumers turned the online market a reliable source. Such the popularity that nowadays, the established business of the real world is making their virtual presence felt. Most obviously, such a market is neither geographically restricted nor timely bound, and that stretches the market hour to 24 hours a day.

From the producer side now, one does not have to own a shop to sell his product but can easily display his item online and sell directly to the customer. From the customer’s point of view, home delivery is always welcome, and advancement in e-payment has made an online payment to the seller quite easy. There can always be payment on receive. Though the digitalization touched all the shores of the world, the performance of South and Southeast Asia has been remarkable in this front, as explained in the article. Increase in sales following digitalization, consumer satisfaction considering time-saving and more varied options of products, competition led a decline in price; all these may be observed from a close level in South and South East Asia, and the margin is more than the global level.

It is apparent that the future of the business in South and South East Asia lies in digitalization and if the governments of the respective countries belonging to this part of the world follow a pro-digital policy then in no time the region will become a global player. ASEAN has already established itself as a global player. China has established it as a global superpower. Perhaps it is the time of the rest of the countries of the region to become active global players. Digitalization through mobile broadband duo will help towards that end.

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REFERENCES


