Determinants of Foreign Direct Investment in Indian E-commerce Sector[1]

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Abstract

The e-commerce sector in India has experienced remarkable growth in the recent past, especially by the entry of many new players in the market. This noticeable growth of the sector has attracted huge amount of private equity investments from both domestic and foreign investors. However, majority of investment in this sector has been made by foreign private equity investors. In this backdrop, the present study makes an attempt to explore the economic factors that facilitated the unprecedented growth and significant volume of foreign investment in the sector. We model the empirical analysis by treating the equity inflows of foreign players in e-commerce depends upon the variation in the number of mobile and internet subscribers at the aggregate level. The study use OLS regression model with the time series data for the time period from 2000 to 2016. The econometric result reveals that both mobile subscription as well as internet subscription has positive impact on FDI. However, relatively, the impact is positive as well as statistically significant among mobile subscribers.

Key words: *E-commerce, FDI, Private Equity, Mobile Subscription, Internet Subscription*.

1. Introduction

Since the adoption of New Economic Policy in 1991, the Indian economy initiated systematic changes from highly State controlled regime to more liberal and outward oriented market-friendly policy regime. One of the main objectives of the policy change was to integrate the economy with rest of the world so that the domestic industrial sector could get an opportunity to learn, adopt and strengthen the productive base in the long run. The new policy change envisages that a more open economy will be able to overcome inherent structural rigidities and improve productive efficiency and competitiveness of the domestic industrial sector. It was believed that such as regime will be able to attract large amount of Foreign Direct Investment (FDI) in economic sectors that will provide much needed investment resources, management expertise and technical change. Since FDI is viewed as an essential source of foreign technology and knowledge, several policy initiates were made to attract and utilize them across sectors over the years.

Since 1991, the scope of FDI has expanded gradually from manufacturing to services and infrastructure sectors. Apparently, the service industry has attracted large amount of FDI in recent period. Along with other segment in the service sectors, the E-commerce industry is opened for 100 percent FDI in 2000 with the condition that companies engaged only in B2B activities[2]. Currently, it is the service sector that attracts highest foreign inflows and e-commerce industry is a major contributor. During this period, the e-commerce industry was also become the major emerging service sector in the advanced countries with handful of companies controlling the entire market size.

In 2000, India hardy had a player in this industry except baazee.com. The baazee.com was acquired by the American e-commerce giant *eBay* in 2004 and India received its first FDI in this particular sector[3]. During the period from 2004 to 2008, eBay was in Indian market without any significant rival. The scenario changed with the entry of *Flipkart.com*, company in the same sector promoted by two Indians. Since then the e-commerce sector in India has witnessed a

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[2] Press Note No2, 2000 Series. DIPP, Ministry of Commerce and Industry, Government of India
B2B, is a type of transaction that exists between businesses, such as one involving a manufacturer and wholesaler, or a wholesaler and a retailer. In this type of business transaction end user of the goods and services sold are not involved.
[3] eBay buys Bazee for 230 Crore, Indian Express, New Delhi Edition Dated 24/6/2004 ISID Clipping Services

remarkable growth. For instance, the e-commerce sector in India has reportedly grown at a rate of more than 34 percent CAGR between 2009 and 2014 (PwC, 2015). The major players like Flipkart, Amazon, have reported increase in their revenue consistently[4]. The total size of the industry during 2016 was reported to be US $14.5 billion and expected to touch US$ 80 billion by 2020[5]. The Global Payments Report, published annually by Worldpay suggests that India will become the second largest market overtaking USA by 2034[6]. Similar growth rate can also be noticed in the foreign investment made in this industry. This high growth performance has attracted investments from various global e-commerce players, including Amazon, Ebay, Alibaba etc.[7] The amount of total foreign investment in this industry which was only US$ 2.9 billion during 2014 has increased to US$ 4.4 billion in 2017 (up to Sep)[8]. The e-commerce sector is estimated to contribute around 1 percent of GDP of the country by 2016-17(Kumar, 2017).

Since the sector has witnessed large amount of foreign investment, almost all companies operating in the sector have received some amount of foreign investment. Moreover, companies have even changed their business format to be compliance with the existing Indian law. All these facts suggest the robust growth and development of a sector at a short period of time. Interestingly, not many studies have explored the question of how and why this phenomenal growth has happened in such a short span of time. This involves addressing several larger research questions such as why are all these foreign investors so much interested in investing in India? In particular, what are the factors that determined and fueled such a rapid and remarkable growth of this sector? The purpose of this study is to make an attempt to explore the potential determining factors in attracting FDI in Indian e-commerce sector in such a short period of time.

The rest of the research paper is structured in the following manner. In the following section 2, we address the issue of defining FDI in e-commerce sector. This is followed by a brief overview of the theoretical frameworks and related empirical studies in the literature. It is followed by an

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[4] http://www.livemint.com/Companies/fmBluCG74XDjuBiXS5PJaP/Flipkart-pares-losses-boosts-revenue-at-its-largest-unit.html

[5]http://www.financialexpress.com/industry/-in-india-from-180-in-2015-growth-crashes-to-12-in-2016-at-14-5-bn/530070/

[6] http://www.business-standard.com/article/current-affairs/india-set-to-become-world-s-largest--market-116120500765_1.html

[7] Recently Wal-Mart has also started its e-commerce operation in India. Rakuten, the biggest e-commerce company of Japan has also expressed its interest to enter the Indian market (Choudhury, 2015).

[8] As per the data compiled from Venture Intelligence 2017 The data for only IT and ITES sector is considered

analysis of the trends of FDI in e-commerce industry in India in Section 3. In section 4, we provide the methodology and data source of the study. This includes discussion of variable selection, mathematical model and data sources. Section 5 provides the empirical results and findings. The final section 6 provides concluding remarks.

2. Is it really FDI that flows in Indian e-commerce sector-?

It is evident from the above discussion that a huge amount of foreign investment has flown in this sector. Now, the question is whether these investments are in compliance with the definitions of various international bodies. In what follows, we intend to examine the wide range of definitions and concepts developed by international organizations to comprehend whether the reported FDI inflows real or statistical artifacts.

Balance of Payment (BOP) Manual of IMF defined the FDI as a category of international investment that reflects the objective of obtaining a *'lasting interest'* by a resident entity in one economy in an enterprise resident entity in another economy. The lasting interest implies the existence of a *long term relationship* between the direct investor and the enterprise, and a significant degree of influence by the investor on the management or the enterprise. OECD defines FDI as cross-border investment made by a resident in one economy (the direct investor) with the objective of establishing a *lasting interest* in an enterprise (the direct investment enterprise) that is resident in a country other than that of the direct investor (OECD 2008). According to UNCTAD, FDI is an investment involving a *long-term relationship* and reflecting a *lasting interest and control* by a resident entity in one economy (...) in an enterprise resident in an economy other than that of the foreign direct investor (...). FDI implies that the investor exerts a *significant degree of influence on the management of the enterprise* resident in the other economy (UNCTAD, 2013).

All the definitions cited above agree on the point that investor should have lasting interest and significant control over the investee firm. When we identify FDI along these standard definition criteria, we find that the inflow of foreign investments in Indian e-commerce sector does not strictly qualify as FDI. According to Sengupta (2017) , foreign investments made in this sector are Private Equity (PE) investment that does not have lasting interest in company management. However, it is also to be noted that majority of the investing firm holds more than 10 percent of shares in the investee companies and possess significant control and even nominated directors in the investee firm (see Choudhury, 2015). This unique pattern of management practice is direct consequence of current regulatory regime of the government as foreign investment in any form is not permitted in the retail e-commerce activity, and therefore, companies have adopted a unique marketplace model[9] of investment. Using the marketplace model stratergy, which is open to FDI, the Indian companies have been able to compliance with the existing law (Choudhury, 2015). A long time debate is ongoing whether to include PE investment in FDI (See Rao et. al, 2013). Since we are not been able to segregate private and foreign equity participation using existing data, it is decided to consider the PE investment in e-commerce sector of India as FDI. As such, both PE investment and FDI is used interchangeably[10] in our study.

2.1 Theoretical Framework

There exists vast theoretical literature explaining the determinant of capital flows across national borders. Most theories explain different facets of FDI such as motives, impact, determinants and so on. However, the empirical results vary with the country, sector and industry. In this section, we provide some of the traditional as well as modern theories of FDI along with some empirical studies that are relevance to our research questions.

Initially, the theories of capital market and portfolio investments were used to describe the initiation of FDI. Originally, direct investment was an international capital movement only (Kindleberger, 1969). In fact, prior to 1950, FDI was regarded as a subset of portfolio investment. Stephen Hymer was one of the pioneering economists to establish a systematic approach towards the study of FDI theories. Hymer (1960) developed the industrial organization approach of FDI theories. His theory of FDI was the very first work which explains international production, firm-specific advantage and activities of the Multinational enterprises (MNCs). His theory found favor with Lemfalussy (1961), Kindleberger (1969), Knickerboker (1973), Caves (1974), Dunning (1974), Vaitsos (1974) Cohen (1975). Hymer argued that the imperfection in

[9] except in cases of a manufacturer selling it products manufactured in India through retail, or a single brand retail trading entity operating through brick and mortar stores, or an Indian manufacturer selling its own single brand products through retail.
[10]We considered PE as FDI only for this paper.

the market leads to the existence of MNCs.[11] His theory focused on the two types of imperfections in the market. First, the imperfections in transaction-cost and second, the imperfections in the size of the organization. According to Hymer the bigger sized firm will bring the ownership advantages to the host countries in order to compete with domestic firms.

Dunning (1977, 1979, & 1988) in his path breaking works amalgamated three different explanations as to why a firm opens its foreign subsidiary. The theory also discussed the entry choice for MNE. This theory of eclectic paradigm is also referred to as OLI paradigm. In his theory Dunning integrated the oligopolistic theory or the theory of Industrial organization, the internalization theory and location theory to explain the reasons for firms to operate internationally. Dunning argued that the Ownership advantages (O), Locational Advantages (L) and Internalization (I) are the preconditions for a firm to produce its goods internationally.

Extending this OLI paradigm of Dunning (1995, 1998) Singh and Kundu (2002), offered a theoretical framework to present the changes brought in by *e-commerce* companies. They called the revised paradigm the N-OLI framework which represents the network (N)-based advantages prevalent in e-commerce, namely, those of embeddedness, electronic brokerages, and network economics. Their theory is also regarded as a foundational structure in the study of e-commerce theories (Agarwal and Wu, 2000).

Apart from traditional and classical theories of FDI presented above, a fair number of theories have been developed in the recent past. These are generally referred as *modern theories* of FDI. The classical theory focuses on the FDI flows from a developed countries, while the modern theories focuses on the FDI flows from developing and emerging economies. (Mathews, 2002, 2006, Buckley, 2010). Several theories have also been propounded and conceptualized specific to the emerging economies. (Mathews, 2002, 2006). Mathews proposes a complementary model to the OLI paradigm, adapted to the level of MNEs from the emerging economies: LLL (linkage, leverage and learning). Mathews (2006) highlighted that MNEs from the emerging economies like , India, China Brazil are the new entrants on the international markets may be, at the same time, a benefit for them, by the access to advanced technology (by imitation), and, based on this, the reduction of property gaps against MNEs in the developed countries. Dunning *et al.* (2008)

[11] Most of the FDI flows through MNCs; consequently theories explaining FDI are also invariably explaining MNCs.

recognized that emerging MNEs are short of the “O” component (ownership or property benefits), but this does not mean that such benefits are absent. This argument of professor Dunning fits in case of the ecommerce companies like Alibaba of China.

2.2 Empirical Evidences

Along with the above theoretical explanation of the international capital movement there also exist a vast set of empirical studies. This set of literature can be classified into two different sections. First, those studies which explains the macro level determinants of FDI inflow and second, the sector level studies which describes the reasons behind capital flow in a particular sector.

ADB (2004) argued that factors like technological advancement, holding bilateral investment treaties, emergence of integrated production and marketing networks at the international level have resulted in significance increase in the inflow of international capital in the various developing countries. Bouoiyour (2003) commented that countries are aggressively trying to attract foreign investment by offering income tax holidays, import duty exemptions and subsidies to foreign firms, as well as measures like market preferences, infrastructures and sometimes even monopoly rights.

The literature remains largely inconclusive regarding whether FDI may be sensitive to tax incentives. Some studies have favored that idea that host country corporate taxes have a significant negative effect on FDI flows, while other have maintained opposite view on the idea. Hartman (1994), Grubert and Mutti (1991), Hines and Rice (1994), Loree and Guisinger (1995), Cassou (1997) and Kemsley (1998) are some of the studies maintaining the idea that host country corporate income taxes have a significant negative effect on attracting FDI flows. That is higher the tax rate lower is the FDI inflows. As against these studies Root and Ahmed (1979), Lim (1983), Wheeler and Mody (1992), Jackson and Markowski (1995), Yulin and Reed (1995) and Porcano and Price (1996) conclude that high taxes positively impacts the FDI inflow.

Charkrabarti (2001) suggested that the market-size of the host country plays a big role in attracting foreign capital. Market size hypothesis maintains that large market is required for efficient utilization of resources and exploitation of economies of scale: as the market-size grows to some critical value, FDI will start to increase thereafter with its further expansion. The study also argued that trade openness (measured by the ratio of exports plus imports to GDP) also plays a vital role in determining the inflow of FDI.

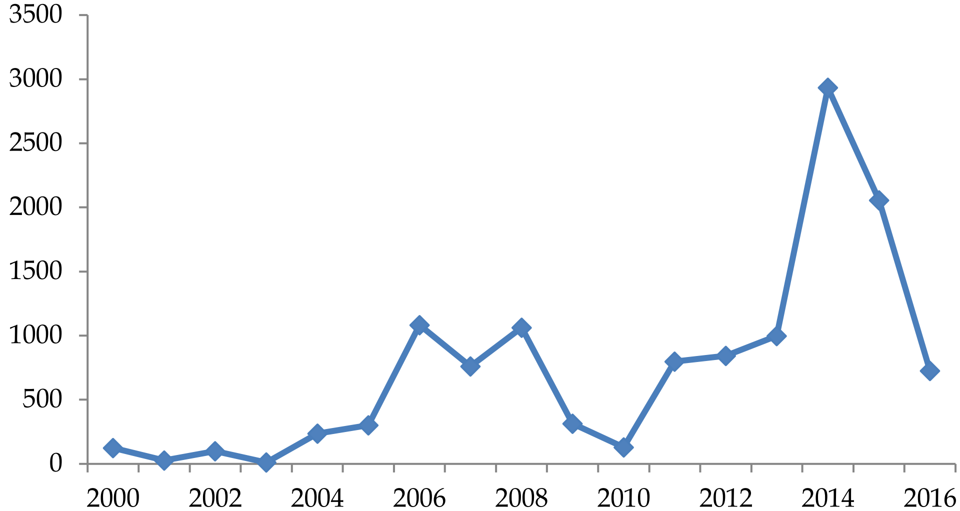
In the case of e-commerce, there is considerably less evidence on the determinant of investment pattern, especially for less income countries such as India. Raipuria (2000) studied the e-commerce in the context of opportunities for Indian export. He argued that for a business, it is essential for the survival and growth in the competitive world. Satapathy (1999) commented on the commitment of a nation in WTO in regard to e-commerce. The study discussed various proposals and their implications undertaken in WTO regarding e-commerce. Government policies governing e-commerce sector is also not very clear and robust. Debate is also going among the members whether to include it in the purview of WTO. Agarwal and Wu (2000) examined various factors influencing the growth potential of e-commerce in emerging economies from a multi theoretical perspective while Gupta (2017) investigated the role of the government policies in expanding the growth of ecommerce sector in India. A similar study was conducted by Viswanathan and Pick (2005) comparing the India and Mexico which focused on the policy and institutional variables that might impact the diffusion of e-commerce sector. Kuthiala (2003) explored the opportunities and challenges that India faces in adoption of e-commerce. Analyzing the secondary data the study outlines the potential gains that India can make in the global market by adopting e-commerce. For a review of the literatures on e-commerce sector, see Vaithianathan (2010).

3. Trends of Investment flow and Shareholding Pattern in E-Commerce Industry in India

The increasing role of the Private Equity (PE) firms, in Indian e-commerce sector can be understood from the fact that more than 400 investments have been made by them between 2007 and 2014. All the domestic as well as foreign investment made in this sector is by PE firms. In the year 2013, PE firms invested $617 million with 31 deals in this sector. The number of deals increased to 40 with the total investment value of US$ 4402.23 million in the year 2017. These investments have also covered different segments and sizes of business across sector. It is to be noted here that, Indian e-commerce giant Flipkart only, received US$ 4000 million out of this amount. In the US$ 4000 million, Japanese investor soft Bank invested US$ 2500 million in August 2017. Flipkart's investment was followed by another e-commerce brand Paytm. The trend in Foreign PE investment in E-commerce sector of India is given in Figure 1.

Figure 1

Trend in Foreign Private Equity Investment in Indian E-commerce sector (2000-2016)



Source: Authors calculation from Venture Intelligence Database

Since 2002, there has been steady expansion except period 2006-08 and 2014-16. The trend of the PE investment shows a steady stage during the 2000-2003. After 2005 it increased to some extant but with fluctuations. Again in 2013 it steeply increased and also fell steeply during 2016. *Table 1* depicts the fund raised by the major e-commerce players in India and the major investor since 2014. The closer inspection of the data reveals the skewed nature of the investment made in the e-commerce sector. We can observe that, even though a huge amount of investment was made in the e-commerce sector, but the majority of the share has been received by only a few companies. The big companies like flipkart, Snapdeal, Jabong, Paytm, Pepperfry.com have received the largest share in it.

Table 1

Major Investors and Investee firms in Indian sector

Year	**Amount (Mil US$)**	**Major Investors**	**Major Investee**
2014	2933.0	Tiger global, Nasper, Accel Partners, DST Global, ICONIQ Capital, Morgan Stanley , Temasek	Pepperfry.com, Snapdeal.com, Jabong.com, FabFurnish.com
2015	2057.00	Temasek, Soft Bank, Kalaari Capital Goldman Sachs	Snapdeal, UrbanLadder.com Pepperfry.com
2016	725.87	Helion Ventures, Bessemer, Ascent Capital,	Furlenco Snapdeal, Industrybuying.com, Big Basket
2017	4402.23	Nasper, Tencent, Soft Bank, Nexus,	just buy, flipkart, snapdeal, paytm, UrbanLadder

Source: Dealcurry 2013, 2014 Venture Intelligence 2015 onwards. Data includes on e-commerce and mobile commerce under IT and ITES sector

In the year 2014, the Flipkart raised $1 billion from a group of PE investors. This is notable that, this investment was one of the biggest investments raised in a single round by in an information technology firm in the world. The other major deals globally include Facebook's record $1.5 billion transaction ahead of its IPO (which included a secondary component, meaning that portion went to selling shareholders and not into the company); and Yahoo's $1 billion deal to buy a stake in Alibaba. The same record was broken by flipkart itself in the year 2017 when it raised another US$ 2.5 billion from Japanese investor Softbank.

3.1 Shareholding patterns

The share holding patter reveals how the *ownership* of the total volume of shares (equity and preferential) of a company are divided (ownership division and distribution) among the various entities and individuals. This sub-section depicts and compares the share holding pattern of the major players of the Indian e-commerce companies in recent period. The selected companies hold the majority share in the market.

The table 2 provides the various shareholders or owner of the major players in the ecommerce sector in India. Flipkart.com is controlled by the entity Flipkart Internet Private Limited. The website Amazon.in is managed by Amazon Sellers Services Private Limited, while paytm is controlled by One97 Communications. New Delhi based firm Jasper Infotech manages the website Snapdeal.com.

Table 2
Share holding patterns of Indian E-commerce companies

Company/websites	Shareholders and theirs shares in %
Flipkart	Tiger Global (29.5), Accel partners (11.5) ,Binny Bansal (8.7), Sachin Bansal (8.7), Intervision Services (18.4), Othewrs (23.2)
Snapdeal	Soft Bank (32.98) Kunal Behl (3.94), Kaalari Capital (7.81), Nexus (9.71), ebay (6.32), Rohit Bansal (2.44),Alibaba (2.93), Foxconn (4.03), Temasek (2.65), Others (27.19)
Amazon	Amazon Asia- Pacific Resources Private Limited, Singapore (99) Amazon Eurasia Holdings S.A.R.L, Luxembourg (1)
Paytm	Alipay Singapore E-Commerce P Ltd (32.41), Mr. Vijay Shekhar Sharma (21.33), SAIF III Mauritius Co Ltd (20.37), Alibaba.com Singapore E commerce Co P Ltd (8.53) , AIF Partners India P Ltd (8.31)

***Source*:** Ministry of Corporate Affairs, Government of India

The descriptive analysis reveal that majority of the shares in these companies are held by foreign PE investors. It interesting to note that, this pattern of shareholding has changed drastically from the initial period of company formation. These companies raised funds by issuing equity shares to the listed investors and subsequently reached the current pattern. At present, the situation is that none of the initial founders of these companies are holding controlling stake or voting rights in the company, except Amazon.in, which is a subsidiary of Amazon Asia Pacific Resources Private Limited and Amazon Eurasia Holdings S.A.R.L, Luxembourg. However, they also invested a huge amount of money in their Indian subsidiary in different time periods since their formation in 2013.

It is clear from discussion that both foreign as well as Indian investment firms are investing in the fast growing sector. The high growth rate and its high potential to earn huge profit in the near future have attracted these PE firms to invest in the sector. The constantly growing market for online retail, favorable demographic structure, increasing internet and mobile penetration (as discussed below in detail) are some of the major factors helping the industry to attract high volume investment.

5. Methodology and Data Sources

There are various factors which play decisive role in the growth of a particular sector in an economy. Persistent growth of e-commerce sector has attracted a number of foreign investors. Today, majority shares of almost all the companies operating in the industry are held with foreign investors (Banerjee, 2016). This growth is contributed by many factors like rapid adoption of modern technology by Indian consumers, increase in the number of internet users, innovative and different business models and alternative payment options offered by E-commerce companies (Kumar, 2017). This indicates the significance of ICT in enabling a conducive platform for investment in short-period of time.

Today's world, especially in the urban areas, people are accustomed on online purchases instead of visiting physical stores for their domestic need. Availability of everything in our finger tips has made this possible. Today in any 1 tier or 2 tier city, we can purchase our daily fruits and vegetables to high-end jewelry without visiting the physical store. Government policy to promote digitalization and digital transaction has also helped this industry to grow. The Indian government has strongly encouraged the development of the Internet and information technology through various incentives; including exempting the industry from burdensome regulations and controls (Miller, 2001, Gupta, 2017). Many of the activities that were possible to do offline earlier is not possible now without using internet or going online. For instance, income tax return have made mandatory to be filled online, shares and debentures cannot be bought in physical form, cash transaction is not possible after certain limit etc. Most of the commercial banks are promoting online transaction and offering discount or some kind of privileges to use online banking system. Evolutions of digital wallets, gift cards, and some other similar payments methods which are used through an online platform, have promoted and in some cases (income tax return filing, buying share etc.) mandated the use of digital transaction which obviously further helped e-commerce sector to grow.

As such we argue in this paper that the large growth and wide range diffusion of e-commerce technology through FDI in the Indian market is because of the increase in ICT usage, especially high penetration of internet and mobile subscribers. This is elaborated in the following sub-section.

(a) Internet penetration-

As per a study conducted by Cisco, there are around 373 million, which is 28 percent of total population in India are connected with internet in 2016[12]. A report entitled 'Internet in India 2016' by the Internet and Mobile Association of India (IAMAI) and IMRB, mentions that the number of internet users in India was 278 million in October 2014 which increased to 432 million in December 2016, of which 269 million, or 62.3% were from urban India and 163 million, or 37.7% were from rural India. According to the report, 51% of urban Internet users or 137.19 million use internet daily, while 90% of urban Internet users or 242 million use the internet at least once a month. On the other hand, in rural India, 78 million users or around 48% use the internet daily, while 140 million, or around 83% use the internet at least once a month[13]. India added 60 million new internet users in 2016, and around 100 million users (existing + new) took up broadband connections, according to the Telecom Regulation Authority's report 2016.

(b) Mobile penetration

[12] https://yourstory.com/2017/06/india-internet-users-report/
[13] https://www.medianama.com/2017/03/223-iamai-internet-india-2016-report/

Currently, India is the biggest consumer of mobile phones in the world[14]. Almost half of the country's population now subscribe to a mobile service. As per the report prepared by GSMA 2016, India has 616 million active unique mobile subscribers, out of which 238 connections are using smart phones. Mobile broadband connections are growing at the rate of 15 percent per year. A Confederation of Indian Industry (CII) report estimates that in the next six years, the number of people accessing the internet through mobile is set to reach 600 million[15]. The GSMA report estimated Over 400 million SIM connections are expected to be added by 2020, bringing the connections penetration to just over 100%.

Reducing call rates, availability of the smart phones at cheaper rates and also offering of Equated Monthly Installment (EMI) facilities have facilitated the use of mobile phones to a large extent. Price of data plans available in India is two times cheaper than in China and three times cheaper than in the United States[16]. This in turn increased the accessibility of e-commerce websites. Accessing e-commerce websites through mobile phones have increased significantly in India, in recent time. Mobiles will play a major role in driving this growth. At present, mobile commerce represents nearly 50% of online retail sales in India, compared with around 48% in China and 34% in the US. Nearly half the $12 billion in yearly online sales in India takes place through mobile phones, which are set to overtake PC-based sales in 2016 and reach $51 billion by 2020, according to a recent report by research firm Forrester. Myntra, a fashion retailer owned by Flipkart, saw 90% of its traffic and 70% of its sales from mobiles before famously abandoning its PC-based site altogether[17]. Approximately same is the case with another e-commerce firm Snapdeal. Snapdeal records 50 percent of its sales order comes through mobile app[18].

The development of mobile application used for Shopping has contributed immensely in the sale of e-commerce companies. A shopping app on a mobile device facilitates a person to shop from anywhere, anytime. This has made shopping easier and faster as compared to shop using a

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[14] http://www.business-standard.com/article/current-affairs/india-set-to-become-world-s-largest--market-116120500765_1.html

[15] http://www.business-standard.com/article/companies/5-factors-that-will-drive--growth-115021201785_1.html

[16] http://www.business-standard.com/article/current-affairs/india-set-to-become-world-s-largest--market-116120500765_1.html

[17] http://www.livemint.com/Industry/hq14qOAOPNhevLeAAZABeK/Mobile-phones-to-dominate-online-sales-medium-in-India-rep.html

[18] http://www.firstpost.com/business/goodbye--hello-m-commerce-50-of-snapdeals-sales-come-via-mobile-flipkart-tries-to-catch-up-1970063.html

desktop computer. To facilitate the consumers, and promote their mobile application, e-commerce companies have come with exclusive and user friendly applications. It also offers a greater degree of personalization. All these have resulted increase in the sales of the e-commerce companies. Flipkart has also been following a mobile first approach and 70% to 75% of their total traffic is already coming from mobile app.[19]

Cash on delivery or paying at the time of delivery of the goods purchased online is another significant reason of the increase sale of the e-commerce companies. Renowned business magazine Business Today reported that as per a study conducted by Ernst & Young (E&Y), COD accounts for 50 to 80 per cent of online transactions in India.[20] Increase in the number of credit card users is another reason of exponential growth in the sale of e-commerce companies. Faster and on time delivery of goods, delivering goods at rural/remote areas emergence of exclusive logistic companies for delivering goods sold by e-commerce companies have also push their sales volume.

5.1 Econometric Methodology

Based on the various theoretical and descriptive trend analysis, we model that the significant Foreign Investment inflows in e-commerce sector depends on mobile subscription and internet penetration, reflecting ICT usage. In functional form, it is written as follows.

$$PE = f\,(MP, IP) \text{ ----- } (1)$$

Here, PE is private equity, MP is mobile penetration and IP is internet penetration.

We use multiple linear regression on a log-log model. We use simple OLS regression estimation technique is used to assess the relationship and impact of the independent variables on the dependent variable. The model functional form is given in equation (2).

$$\ln PE_t = \alpha + \beta_1 \ln MS_{\backslash t} + \beta_2 \ln IS_t + €_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

[19] http://www.livemint.com/Industry/FBOVKPg5hZm1JVuLM3n1cM/Flipkart-Myntra-users-go-mobile-desktop-still-key-for-onli.html

[20] http://www.businesstoday.in/magazine/cover-story/cash-on-delivery-impact-on--companies-customers/story/202680.html

Here PE_{it} = Private equity inflow in e-commerce sector in India during the time period *t*. MS refers to number of mobile subscribers and IS refers to number of internet subscribers in India during the time period *t*.

5.2 Variable selection and Data

After conducting through review of the literature, it has been found that a lot of studies have studied the determinants of the FDI in an economy or a sector in particular. But, there is hardly any research study analysing the determinants of the inflow of investment in e-commerce sector in India. Since there is hardly any academic study available, on the same theme in Indian context, we consulted a number of media articles and studies conducted by some renowned private consulting firms like PwC, Deloitte and others, while selecting the appropriate determinant variables for the study.

The data set used in the current study consist of three variables namely, PE investment in Indian e-commerce sector, total mobile and internet subscribers in India. The time period considered is from 2000 to 2016. The selection of the time period was strictly based on the availability of the reliable and continuous data.

The annual reports published by Telecom Regulatory Authority of India (TRAI) were consulted for compiling data on mobile and internet subscribers. However, due to non availability of annual report of TRAI prior to 2005, data were extracted from *Indiastat.com* for the same variables. Indiastat.com is a well known data providers in India which covers various sector of the economy and other sectors. It provides secondary level socio-economic statistical information about India, its states, regions and sector. It is widely used by Indian academia.

Another data base called Venture intelligence was relied upon to collect PE investment in Indian e-commerce sector. Venture intelligence one of the leading source of information and analysis on private company financials, transactions (private equity, venture capital and M&A) and their valuations in India. This database is used extensively by transaction industry practitioners, entrepreneurial companies, educational institutions and the media**.**

All the analyses were carried out using the statistical software called Gretl. It is a cross-platform software package for econometric analysis. It is free, open-source software. This is published by the Free Software Foundation.

6. Determinant of FDI in e-commerce: Estimation Results

In this model, we have taken the natural log of both dependent and independent variables. Since the model is in log, the coefficients have elasticity interpretations. According to the estimated model reported in Table 3, a 1 percent increase in mobile subscribers will increase private equity inflow by 0.4 percent, holding internet access constant. The result is found to be statistically significant at 10 percent level. Similarly, a 1 percent increase in internet subscribers will increase PE by 0.2 percent, holding mobile access constant. However, the coefficient is found to be not significant statistically.

Table 3
Determinant of FDI in e-commerce: OLS Estimation Results (2000-2016) T = 17
Dependent variable: ln_PE

Independent Variables	***Coefficient***	***Std. Error***	***t-ratio***	***p-value***
const	3.40733	0.594927	5.727	<0.0001***
ln_MOB	0.396467	0.196115	2.022	0.0628*
ln_INT	0.163972	0.198436	0.8263	0.4225
Mean dependent var	5.884321		S.D. dependent var	1.503366
Sum squared resid	14.53081		S.E. of regression	1.018781
R-squared	0.598172		Adjusted R-squared	0.540768
F(2, 14)	15.91003		P-value(F)	0.000249
Log-likelihood	−22.78795		Akaike criterion	51.57589
Schwarz criterion	54.07553		Hannan-Quinn	51.82436
rho	0.010636		Durbin-Watson	1.855098

Note: HAC standard errors, bandwidth 1 (Bartlett kernel), * denotes significant at 10 percent level. The reported standard errors are robust.

The econometric results reveal that both mobile subscription and internet access have a positive impact on the level of private equity inflow in India. However, relatively, the impact is prominent and statistically significant for mobile subscribers. Based on R^2, we can argue that the OLS model has been able to explain 60 percent of the variation in the dependent variable based on the selected independent regressors.

Thus, based on the regression model it is found that ICT has major influence on investment by foreign companies in e-commerce sector in India. The major driver of FDI is the increased penetration of mobile subscription in the recent period.

7. Concluding Remarks

The e-commerce sector in India has witnessed remarkable growth in the recent years. Many of the players have emerged in this sector during this time period. Both Indian and foreign companies are competing each other in this sector. The noteworthy growth has also attracted many of the private equity investors from both domestic and foreign countries. In this regard the study attempted to analyze the factor helping the sector to achieve and maintain consistent growth rate in such a short period**.** In particular, the study is an attempt to explore the major factor playing the determining role in attracting foreign investment in the form of private equity in Indian e-commerce sector. We use regression analysis and use mobile subscription and internet penetration as significant determinant of foreign private equity in e-commerce. Among the factors we considered in the econometric model, both internet usage and mobile subscription have positive impact on FDI. However, the effect is statistically significant in the case of mobile phone subscription.

The result reveals that the deep penetration of mobile and internet networks has facilitated the users to make online shopping that has created an incentive structure for foreign players to invest and expand business opportunities in India. The increased use of smart phones and wide use of the mobile application for shopping has also helped the e-commerce companies to increase their sales volume and higher growth rate. Cash on delivery, catering remote location, timely and fast delivery by the companies has also helped them to increase their sale volume and sustain growth.

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