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OPTIMAL ANTITRUST PENALTY

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INTRODUCTION

An effective and robust penal provision is *sine qua non* for successful implementation and enforcement of any law intended to protect the interest of society at large. India's Competition Law regime is relatively new as compared to other jurisdictions and do not have any set guidelines for computation of penalties. As of March 2018, the Competition Commission of India ('**Commission**') had levied a total of Rs.13,523 crores of penalty in 135 cases and recovered only Rs.55 crore i.e. 0.4%.[4] This low realization rate is attributed to uncertainty in computation of penalties by the Commission and pending appeals in various judicial forums.[5] The Competition Act, 2002 (Act) provides wide discretionary powers to the Commission to determine pecuniary penalty based on the facts and circumstances of the case. Section 27 enumerates only a maximum cap of ten percent of the total turnover or three times the profits (in cartel cases).[6] In the absence of any guidelines, there is no transparency in the penalty estimation methodology and, thus, no predictability in its magnitude. To have a strong and effective antitrust enforcement it is imperative to have a penalty regime that imposes an optimal level of fine. Recently, the Competition Law Review Committee ('**CLRC**') was constituted by the Government of India to bring the Act/ Rules/ Regulations in consonance with the changing business environment by reviewing the act and looking into international best practices of several established jurisdictions related to competition (Committee, 2019). The CLRC, in its report, highlighted the problems associated with wide discretionary powers exercised by the CCI in imposing penalties and recommended the formation of detailed guidelines for computation of penalties for antitrust violations.[7]

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[5] Multiplex Association of India v. United Producers *See also*, Uniglobe Mod Travels Pvt. Ltd v. Travel Agents; Cement Cartel Cases; MCX Stock Exchange; Ramakant Kini v. Hiranandani Hospitals etc.
[6] Section 27 of the Competition Act.
[7] The report of the Competition Law Review Committee, July 2019,http://www.mca.gov.in/Ministry/pdf/ReportCLRC_14082019.pdf

With an objective of achieving deterrence in the violation of competition law in India, this paper reviews the international best practices on penalties and the literature on optimal penalty estimation to recommend the guidelines and methodology for penalty estimation.

OBJECTIVES AND PROCEDURE OF COMPUTING PENALTIES ACROSS JURISDICTIONS

The main objective of pecuniary penalties across all major jurisdictions is to ensure effective deterrence, disgorgement of illegal gains in order to punish the companies for antitrust violation (Development, 2010) .The idea is not only to recover illegal gains made by companies through anticompetitive practice, but also to deter them from engaging in the same conduct again as well as prevent potential antitrust violation by other companies.

In terms of procedure, major jurisdictions around the world follow a general threefold approach for penalty estimation to ensure deterrence and predictability: determination of base penalty; adjusting the base penalty by taking into account several aggravating and mitigating factors; adjusting the amount to ensure the final amount of penalty is within the prescribed fine cap (Pedro Caro de Sousa, 2018). A review of objectives and procedure for antitrust penalties followed by major jurisdictions is provided below:

1. **European Union:**

The European Commission's (EC) fining guidelines clearly enumerates the objective of penalties for antitrust violation "*to have a sufficiently deterrent effect, not only in order to sanction the undertakings concerned (specific deterrence) but also in order to deter other undertakings from engaging in, or continuing behavior that is contrary to (general deterrence)*" (Union, 2006).

The EU Fining Guidelines, 2006 provides a three- step approach. *First,* the base penalty is determined based on the value of sales derived from infringement in the relevant market during last full financial year, multiplied by the duration (number of years) of infringement. The guidelines prescribe a maximum of 30% of the total value of sales that can be taken into account while determining base penalty. Hardcore cartels are penalized more severely by allowing the EC to include an entry fee between 15% to 25% of the value of sales in the basic amount.[8] *Second,* the amount determined in the first step is further adjusted by weighing several aggravating and mitigating factors.[9] *Third,* the guidelines emphasize the need to ensure that the

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[8] Union, O. J. (2006, September 01). Guidelines on the method of setting fines imposed pursuant to Article 23(2)(a) of the Regulation No. 1/2003. Europe: European Union
[9] id

fines have a sufficiently deterrent effect, and to enable that, it encourages the EC to go beyond the affected commerce, but not exceeding the penalty cap of 10% of the total turnover in the preceding business year of the infringing entity. The Guidelines also gives power to the EC to depart from the prescribed guidelines in order to achieve effective deterrence.[10]

2. United States:

The objective behind imposing penalties in the US is that the penalty should be proportional to the contravention in question and should also reflect the seriousness of an offense as well as ensure adequate deterrence.[11] The United States antitrust regime strongly condemns cartel formation and imposes criminal sanctions on hard-core cartels. While imposing pecuniary sanctions, the regulations ensure sufficient deterrence is caused to the guilty party as fining guidelines prescribes imposition of minimum 15% of the total volume of affected commerce in least serious cartel cases (Commission U. S., 2018).

The United States follow a two- step process while computing the penalty i.e. *first*, calculation of base pecuniary penalty which is based on the affected commerce with a maximum percentage threshold of 20%; *second*, adjusting the determined base penalty with the minimum and maximum multipliers indicating several mitigating and aggravating factors where the score cannot be less than 0.75.[12] The US sentencing guidelines also take into account total duration of anti- competitive conduct to be multiplied with the base penalty. The maximum monetary threshold of USD 100 million is also prescribed in US fining guidelines that can be imposed on an enterprise (Secretariat, 2016).

3. Japan:

Japan's Anti- Monopoly Act provides room for both civil and criminal sanctions. The objective of civil penalties is preventive in nature. Japan also imposes criminal sanctions, and punishment, as an objective which is exclusively pursued through it.[13]

The Antimonopoly Act differentiates the types of sanctions such as surcharge, fine and imprisonment based on different offenses. In cases pertaining to price- fixing cartel or control type private monopolization, the parties may be ordered to pay administrative surcharge calculated on the basis of total sales or purchase amount of affected goods or services during the period of infringement (up to a maximum period of three years), and the surcharge rate may

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[10] id
[11] https://www.law.cornell.edu/uscode/text/18/3553
[12] id
[13] Pedro Caro de Sousa, S. E. (2018). *Pecuniary Penalties for Competition Law Infringements in Australia.* Paris: Organization for Economic Cooperation and Development.

vary from 1% - 50% based on various factors laid down in the said Act.[14] On the other hand, companies may be criminally fined or its personnel can be imprisoned if it is involved in activities related to unreasonable restraints on trade or private monopolization.[15] Japan does not provide any discretion to be exercised by the regulatory authorities, even in adjustment of base penalty. There are prescribed mandatory percentage rates to be applied by the authority based on certain factors (can be considered as aggravating and mitigating factors) laid down under the Act. Japan prescribes a numerical threshold for the maximum amount of penalty of JPY 500 million that can be imposed on an enterprise.[16]

4. **Singapore:**

The objective of imposing pecuniary penalties by Competition & Consumer Commission of Singapore (CCCS) for violation of any antirust provision is not only to ensure deterrence, but also to prevent other companies from indulging into any anti- competitive conduct in the future (Commission S. C., 2016).[17]

Singapore's penalty regime is very much similar to European Union. It also follows three step process i.e. determination of base penalty on relevant turnover attributed to sale of relevant product or services in the preceding financial year. Like European Union, the amount is then multiplied by the duration of infringement (number of years). Lastly, the base penalty is adjusted by taking into account several aggravating and mitigating factors. The CCCS guidelines also set a maximum threshold of 10% of total turnover of the infringing entity for each year of infringement up to a maximum period of three years.[18]

OPTIMAL PENALTY ESTIMATION

The objective of a penalty is to punish as well as to deter. The penalty should be set at a level that creates a credible threat that weighs sufficiently in the balance of expected costs and benefits to deter companies to commit antitrust violations. This comes from Bentham and Beccaria's intuitions, that the "criminal" is a rational individual, who calculates the private gains and harms deriving from his behaviour before deciding whether to act or not (Camilli, 2004). In antitrust, other than the US, that has criminal penalties too, all jurisdictions have civil penalties. There are two economic approaches to antitrust penalties- deterrence approach and

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[14] https://one.oecd.org/document/DAF/COMP/GF/WD(2016)81/en/pdf
[15] https://globalcompliancenews.com/antitrust-and-competition/antitrust-and-competition-in-japan/
[16] https://www.globallegalinsights.com/practice-areas/cartels-laws-and-regulations/japan
[17] Commission, S. C. (2016). *CCCS Guidelines on the Appropriate Amount of Penalty in Competition Cases.* Singapore.
[18] id

internalization approach (Wil, 2006). Under the deterrence approach, the optimal fine should exceed the expected gain from the violation multiplied by the inverse of the probability of a fine being effectively imposed, so as to eliminate all violations whereas under internalization approach, advocated by Gary Becker and William Landes, the optimal fine equals the net harm caused to persons other than the offender, again multiplied by the inverse of the probability of a fine being effectively imposed. The internalization approach essentially makes the offender internalize all the costs and benefits of the violation, which is claimed to deter 'inefficient violations' whose total costs exceed the total benefits. Thus, the approach that an antitrust authority should follow is based on their primary goals. If the goal is to prevent extractions of consumers' wealth by firms with market power, i.e. to prevent wealth transfers from consumers to producers, then deterrence approach is to be followed; whereas, the goal is only to 'price' antitrust violations, then internalization approach is appropriate.

The present penalty guidelines in most jurisdictions are only loosely based on these economic principles and fall short of estimating the harm to the society or illicit gain to the offender. (Crime doesn't (always) pay: what determines the level of fines?, 2011). However, even the economic approach is non-operational due to information asymmetry. It is impossible to measure this econometrically. This can only be used only if the infringer themselves estimated these at the time they decided to commit the violation and shared with the competition authority during investigation. In case of cartels, even in theory there is no single formula available to estimate the optimal penalties of different cartel members to deter the cartel (Wil, 2006). The theoretical economic approach can still be referred to as a general guidance for setting up fines and can be used to estimate the parameters or close proxies wherever possible.

For determining the quantum of penalty, some jurisdictions have penalty guidelines which provide for methods of calculation of base penalty, mitigating and aggravating factors, percentage of penalty to be imposed, leniency and settlement adjustments etc. Those guidelines suggest calculating base penalty on the basis of turnover. In some jurisdictions, total turnover is used while in some, relevant turnover or affected volume of sales is used. Moreover, guidelines in most jurisdictions provide a cap on the final amount of penalty. The cap is provided so as to prevent the commission from setting fines very high which the infringing entity is unable to pay and risk running into bankruptcy and may have social and economic costs, as well. Furthermore, the principle of proportionality of penalties, "the severity of penalties must not be disproportionate to the criminal offence" makes higher fines with a lower

probability of detection unacceptable. Also, as the probability of detection also depends on the resources employed by the competition authority for the purpose, higher fines cannot be justified in the expectation of future deterrence. There is also no good method for measuring deterrence and, thus, it cannot be exactly known how effective high fines have been. Lately, the penalties imposed in the EU are in billions and even they may not necessarily have a deterrent effect. Keeping all these arguments in mind, we suggest removing the cap on penalty. It is noted by Heimler & Mehta, as well, *"If the deterrent level of fine is below the statutory cap, the statutory cap is irrelevant; if, on the other hand, the deterrent level of the fine is above the statutory cap, then the fine would be set at the statutory cap and the fine would not be deterrent."* The fines can be estimated considering the ability to pay and the proportionality justice, and also be adjusted using the mitigating & aggravating factors. This also leaves room for the competition authority to follow the economic approach to attempt to determine optimal penalties while giving due importance to the ability to pay and proportionality justice.

As noted above, the estimation of sanctions based on the economic approach is not easy; we also rely on an alternative approach suggested by Heimler & Mehta (2012), in case of absence of any information on parameters or close proxies in the previous approach.

They start with the deterrence approach that says expected sanctions should be at least equal to expected illegal profits:

$$\rho S \geq extra\ profits, \quad (1)$$

where ρ is the probability of being caught, S is the level of the fine, and extra profits are the expected illegal gains.

Solving for S gives the deterrent level of the fine, which should be at least equal to the expected illegally earned profits divided by the probability of being caught.

Deriving from this, Heimler & Mehta suggest different approaches for cartel and abuse of dominance (AOD). It has been argued by them that if the fundamental objective of imposing fine is to ensure deterrence, then penalties in cases of cartel formation must indeed be higher than computing penalties in AOD cases.[19] Looking at the nature of offenses, there are substantial reasons to be more lenient while computing penalties in AOD cases because cartel

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[19] Heimler, A., & Mehta, K. (2012). *Violations of Antitrust Provisions: The* (Vol. World Competition 35). Kluwer Law International BV, The Netherlands.

activities are hard to detect and a lot of manpower and resources are required as they operated clandestinely (Lianos, 2014). Contrary to that, the exclusivity conduct is in public domain and hence the detection rate is much higher. A study shows that the probability of detection of cartels is only 20% and the probability of detection in AOD cases is more than 70%.[20] Furthermore, in AOD cases, imposition of higher penalties may result in firms shifting their burden on the consumers by increasing the prices of products, ultimately leading to decrease in consumer welfare. Cartels in some major jurisdictions such as US, Brazil, Japan, Korea attracts criminal sanctions and jurisdictions like European Union, Singapore, India etc. even though do not impose criminal sanctions but strongly condemn cartel activities as compared to AOD conduct.

The approach used by Heimler & Mehta is discussed below:

In the classic case of a market sharing cartel of similarly sized undertakings in a homogenous market, expected extra profits in relation to the sales of the cartel, assuming all participants agree to a price increase, effective immediately, and that they all respect the agreement, would be given by

$$extra\ profits/sales = (1 - \varepsilon L)\frac{\Delta p}{p} - \varepsilon \left(\frac{\Delta p}{p}\right)^2, \quad (2)$$

where ε is the market demand price elasticity; L is the Lerner market power index defined as $L = \frac{(P-c)}{P}$, that is, the margin (price less marginal cost) over price, calculated before the price increase; and $\frac{\Delta p}{p}$ is the cartel price increase.

This expression for expected extra profits for the cartel and for each representative cartelist reveals that:

1) expected extra profits in relation to sales tend to be smaller than the agreed cartel overcharge;
2) the market demand elasticity is high, the expected extra profits in relation to cartel sales can be expected to be small, even negative;

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[20] Id

3) and less obviously, where the market power index is high, for example, in a tight oligopoly, the expected extra profits originating from the cartel in relation to sales can be expected to be low since, at most, profits reach the monopoly level.

The assumptions on these parameters by Heimler & Mehta are:

a) 15% permanent increase in prices as a result of the cartel;

b) demand price elasticities between 0.5 and 1.2; and

c) Lerner index values between 0.3 and 0.8,

This gives the range of extra profits as a percentage of affected sales within the band 1%– 12.2%.

To estimate the sanctions using this approach, the measurement of these parameters, as well as the probability of detection, will have to be done using data on India.

In case of AOD, Heimler & Mehta noted that the expected extra profits in relation to sales may be assumed to arise from excluding entrants or other small competitors from the contestable part of the dominant's market share which may be obtained by examining the determinants of profits as a proportion of total revenue of a dominant firm facing fringe of price taker competitors.

First, the Lerner index is estimated, which depends on: directly on its market share and inversely on three other elements – the market demand elasticity, the supply elasticity of the fringe competitors, and their market share. Some reasonable estimates of these parameters are required. For the market elasticity of demand, considering that it refers to a market that accommodates a dominant firm, the relevant range of market prices was assumed to intersect the market demand curve in its elastic part, of around 1.5. For the dominant company market share, alternative values are either 70%, 85%, or 95%. With regards to the supply elasticity of competitors, it is supposed to be high when their market share is relatively high (3.0) and low (1.5) when it is small.

On this basis, Heimler & Mehta identified three benchmark hypotheses:

1) a dominant firm with a very high market share (95%) combined with low market share for the competitor (5%) with low supply elasticity (around 1.5) (A firm);

2) a high market share for the dominant firm (85%) combined with medium market share for the competitor (15%) and significant supply elasticity (2.5) (B firm);

3) a dominant firm with market share of 70%, a medium market position of competitor (30%), and significant supply elasticity (3.0) (C firm).

It is observed that the Lerner index is higher than expected extra profits over revenue because of the existence of fixed costs. Heimler & Mehta hypothesised the fixed cost to be in some proportion with the market share of the dominant firm considering economies of scale as the main reason for dominance and thus estimated expected profits over revenue to be approximately half of the Lerner index itself; similarly, the change in expected extra profits. With regard to the probability of detection, in case of abuse of dominance, it is high as it is easier to observe if the competitors are being excluded from the market. The considered the detection probability as high as 70% in general. However, from India's perspective, it may still be useful to estimate the probability of detection as that also depends on the resources employed by a competition authority and their expertize. The following equation was used to estimate the sanctions:

$$S = extra\ profits\ [1 - (1 - \rho)b\delta]/\rho$$

where δ is a discount factor which is assumed to be 1.04 in this case. The range of sanctions estimated in case of abuse of dominance is the range of sanctions in the case of abuse of dominance is estimated to be 3.5%–8.3%, much lower than in the case of cartels.

RELEVANT TURNOVER V. TOTAL TURNOVER

In the previous section, the authors suggest removal of the fine caps; however, for the computation of expected extra profits, turnover estimation is required. In this regard, the matter of relevant turnover and total turnover is discussed below. The Act, under section 27 provides for maximum penalty of 10% on the average of the turnover for the last three preceding financial years or for each year of the continuance of the conduct. The act uses the term *'turnover'* and is silent if it refers to *'total turnover'* or *'relevant turnover'*. The supreme court in *Excel Corp Care* v. *Competition Commission of India[21],* addressed this issue and construed the term *'turnover'* as *'relevant turnover'* to include the turnover pertaining to the quantum of sales made out of the products/services which are subject matter of the contravention only.

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[21] AIR 2017 SC 2734

Internationally, the stance on reference to relevant turnover as the basis of calculation of fines varies across jurisdictions. Some jurisdictions like Brazil and Turkey refers to total/global turnover, whereas others like EU, Germany, Singapore, US etc. refers to relevant turnover. Major antitrust authorities calculate fines on the basis of relevant turnover to recover the illegal gains made by the entity from anti-competitive conduct, and other authorities calculate basic penalty on entity's total/global turnover to have an effective deterrence.[22]As per the doctrine of proportionality, as well, relevant turnover appears appropriate.

Referring to the international practice followed by antitrust authorities and ruling of the supreme court in *Excel Corp Care Case*, the CLRC also deliberated if an amendment is to be made in section 27 to substitute the term *'turnover'* with *'relevant turnover'*. The Committee noted that a penal provision must absorb the principle of proportionality but shouldn't be of such nature that it fails to achieve its objective to create effective deterrence. It noted that in certain cases, like hub & spokes, the hub or other entities may not be directly incurring any income from the product/service that are subject matter of the contravention and hence may escape penalty if the term *'relevant turnover'* being introduced in the act.[23] Therefore, an amendment to replace the term turnover with relevant turnover would defeat the objective of the act. The authors suggest the use of relevant turnover; however, in instances like the ones discussed above like Hub and Spoke Cartel, and also if using relevant turnover leads to under-deterrence, the commission should have the discretion to use total turnover.

AGGRAVATING & MITIGATING FACTORS

Across all major jurisdictions, aggravating & mitigating factors play a significant role in arriving at final amount of penalties. It is important to note that unlike India, all major jurisdictions are mandated to adjust the base penalty with certain aggravating and mitigating factors for effective penal provision as both over-deterrence and under-deterrence is adverse for markets to function effectively. Some of the common aggravating factors which shall be taken for this paper include recidivism, size of firm, duration and type of infringement, leading role in anti- competitive activities, not co-operating with the infringement etc.[24] Several

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[22] Background Paper OECD Secretariat, *Sanctions in Antitrust Cases,* October 14, 2016, DAF/COMP/GF(2016)6

[23] The report of the Competition Law Review Committee, July 2019, pg.79-80 (http://www.mca.gov.in/Ministry/pdf/ReportCLRC_14082019.pdf

[24] https://londoneconomics.co.uk/wp-content/uploads/2011/09/30-An-assessment-of-the-UK-Discretionary-Penalties-Regime.pdf

common mitigating factors include cooperation, minor role in the infringement activities, having effective compliance programme, forceful participation, termination from the anti-competitive activities etc.[25]

The Competition Commission of India in limited number of cases has mildly touched upon the aggravating and mitigating factors such as acting under duress[26], playing active role[27], size of an enterprise[28] ignorance of previous orders on similar issues,[29] continuation of participation despite ongoing investigation[30], existence of compliance programme,[31] recidivism[32]. As mentioned earlier, Indian competition regime gives wide discretion to the Commission for computing penalties and the approach of Commission has been fairly inconsistent without giving any rationale before coming to the final figure. The Commission in the case of *Navin Kataria* v. *Jaiprakash Associates* imposed a penalty of 5% even after clearly observing that the opposite party had huge resources and was also dominant. Also, there are cases where the Commission did not discuss any factors before coming to final figure.[33] In order to curb the inconsistency, the commission must consider for an express inclusion of non- exhaustive list of aggravating and mitigating factors with a percentage range for increase or decrease of base penalty based on the gravity of different factors and it should be mandated upon the commission to refer to the factors and give a reasoned justification before adjusting the penalty.

LENIENCY, SETTLEMENTS AND COMMITMENTS

A monetary penalty regime may not always be effective in creating deterrence. Many jurisdictions employ tools like leniency; settlements and commitments in addition to fines to ensure deterrence. It incentivizes cartel members to disclose information and assist commission for better enforcement of competition law. Such tools increase the probability of detection and undermine trust among cartel participants. Also, detection of cartels using such tools saves the resources of the commission and reduces investigation and enforcement costs. Further, such mechanisms help in reducing the increased backlog of cases as it saves time and resources

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[25] id
[26] MP Chemist and Distributors Federation v. MP Chemist and Druggist Association
[27] Nagrik Chetna Manch v. SAAR IT
[28] Navin Kataria v. Jaiprakash Associates
[29] Reliance Agency Vs. Chemists and Druggists Association of Baroda & Others
[30] In Re:M/s. Crown Theatre vs Kerala Film Exhibitors Federation (KFEF)
[31] Cartelization in Broadcasting service providers by bid rigging submitted in response to the tenders floated by Sports Broadcasters
[32] Krishnamurthy v. KFCC
[33] Hemant Verma v. All India Chess Federation; see also, House of Diagnostics v. Esaote SPA

spent in investigations.[34] India already have a set guidelines for leniency in place. However, the provisions for settlements and commitments are yet to be formulated. The CLRC in its report have also placed emphasis on having guidelines and provisions for the settlement and commitment mechanism.

EXTENT OF DISCRETION EXERCISED BY THE AUTHORITIES

There has been differing stance when it comes to exercising discretion by Competition regulators around the world while calculating penalties. Jurisdictions like EU, Singapore, US are vested with limited discretionary powers while computing penalties and there are jurisdictions such as Japan that does not grant any discretion to the competition authority at all. On the other hand, there are countries like India, Australia where wide discretionary powers are vested with the Commission. By critically looking at the above-mentioned jurisdiction the question that arise is- whether making the system extremely transparent and predictable (ex. Japan) is good or there should be some element of unpredictability involved? As mentioned earlier, the aim of imposing sanctions is to ensure deterrence on both the infringing parties as well on other players in the market from engaging in any future anti-competitive conduct. Transparency and predictability in the system undoubtedly would help to make the enforcement more efficient as potential infringers would be extra cautious before engaging into any anti- competitive activities as they can foresee the sanctions that can be imposed in case of detection and if the penalty is higher than the expected gain then a rational enterprise will not be willing to enter into such conduct. However, making the system fully predictable (like Japan) the firms are likely to make it endogenous in their decisions and alter their conduct. Japan is continuously evolving its regime and 'Commitment Procedure' bill was passed with a view to give some flexibility to the Regulator in cases of AOD.[35] Also, in the dynamic business environment, enterprises do not always act rationally (policy of predatory pricing which is considered as irrational business strategy) and classic economic theory presupposes rationality (Lee, 2016). Imposing penalties as expressly prescribed in the legislations on such enterprises will not ensure deterrence as the enterprise is not acting rationally. It can be concluded that working in extremes would not work for the successful enforcement and there should be a proper mix of incorporating exhaustive guidelines and power of discretion given to the

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[34] Increasing number of cases are directly proportional to the growing economy.
[35] https://www.whitecase.com/publications/alert/introduction-commitment-procedure-under-japan-anti-monopoly-act

regulators. Thus, to ensure transparency, predictability and consistency, propose two-fold approach guidelines for antitrust penalty setting in India, while giving some discretion to the authority by eliminating the fine cap, allowing it to achieve the optimal penalty wherever possible.

SUGGESTIONS AND WAY FORWARD

An antitrust penalty regime of a jurisdiction is formulated on the bases of goals and objectives to be achieved by it. The Supreme court in the case of *Excel Corp Care* v. *Competition Commission of India*[36] noted the objectives of section 27 of the act to discourage and stop anti-competitive practices and to suitably punish the perpetrators of such anti-competitive conduct. The goal of India's penalty regime is to ensure deterrence and hence, a deterrence approach should be followed by the Commission where the optimal fine exceeds or at least be equal to expected illegal gains. These optimal fines should be calculated on the basis of underlying economic principles. However, they cannot be calculated solely on the economic approach as it is non-operational due to information asymmetry. It is impossible to measure this econometrically. It is suggested that a theoretical economic approach must be employed by the Commission for computation of expected extra profits by the defaulting firm(s). The authors have relied on an alternative approach suggested by *Heimler & Mehta* for calculation of extra profits on the basis of probability of being caught, Lerner index, increase in price etc. It is suggested by the authors that commission employ these methods to estimate sanctions using parameters and equations arrived at using the Indian data.

As stated above, for computation of expected extra profits, turnover estimation is required. The act under section 27 provides for a maximum cap of 10% on the turnover. The authors in previous sections have advocated for removal of the maximum cap and give discretion to the Commission for arriving at the optimal penalty. As the standardized approach will not result in effective deterrence because the expected gains in each and every case differs. However, the purpose of maximum fining cap is to prevent firms going into bankruptcy due to heavy fines. Apart from the objective to create deterrence, it is to be taken care that the main objectives and goals of a Competition Law regime are not defeated. The Indian Act has been enacted keeping in view the economic development of the country. Therefore, it is necessary to ensure that a firm(s) do not go insolvent or bankrupt because of heavy antitrust fines. In this regard, it is

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[36] AIR 2017 SC 2734

suggested by the authors that a set guidelines mentioning detailed aggravating and mitigating factors be formulated. The guidelines may specifically mention the factors such as ability to pay, proportionality justice and bankruptcy considerations to avoid over-deterrence. Also, fines alone are not found to be effective enough to created deterrence. Policies for leniency, settlement and commitment are proved to be effective tools in furthering the deterrence effect. India already has a leniency guidelines in place and needs guidelines on settlements and commitments which the CLRC in its report deliberated on.

Further, realization of penalties by the Commission is another elephant in the room that needs immediate attention. As mentioned, only 0.4% of the total penalty has been recovered till now and this has also contributed to low level of deterrence as the parties prefer appeal and the appellate tribunal generally prefer to put a stay on the orders of the Commission. It is suggested that the legislature should deliberate upon setting a minimum percentage of fines that is to be deposited by the parties before preferring an appeal. In case the order is reversed, then the deposited amount can be refunded to the parties.

On the basis of the above discussion, the authors suggest following as way forward:

1. Amendment of section 27 to remove the maximum cap of 10% on the turnover
2. The term *'turnover'* not to be replaced by the term *'relevant turnover'*
3. A detailed guidelines absorbing *Excel Corp Case* decision be formulated specifically dealing with following:
   - Calculation of base penalty on the basis of expected gains based on economic theories and guidance
   - Circumstances when expected gains be calculated on the basis of total turnover
   - and aggravating factors keeping in view the ability to pay, proportionality and bankruptcy among others
   - Adjustment of base penalty on the basis of leniency and; settlement and commitments considerations
4. Setting up a minimum percentage of fines to be deposited by the parties preferring appeal from the commission's orders under section 27.

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DEFINING A "MAVERICK" FIRM: ASSESSING THE CONCEPT'S GLOBAL USE IN ANTITRUST LAW TO EXPLORE ITS APPLICABILITY IN THE INDIAN SCENARIO

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Merger control plays a prominent role in competition law and antitrust regulations. Regulatory authorities around the world frequently assess proposed mergers (also referred to as "combinations[40]") to prevent mergers that may have detrimental effects in the market such as a decrease in competition or harm to consumers. The effects include an increase in prices, lower production levels, lesser product variation, reduced incentives to innovate, etc.

Anti-trust bodies around the world employ a number of analytical tools in merger assessments to evaluate the foreseeable impact of a combination on the economy through two main theories of harm: unilateral effects and coordinated effects.

1. *Unilateral effects* arise when two firms, post their merger, independently involve in anti-competitive behavior. The merged entity finds it profitable to increase its prices (or reduce production, etc.) due to the elimination of pre-merger competitive constraints, increasing the likelihood of market power abuse. It indicates the creation of a single firm dominance in the relevant market, as the firm unilaterally increases its prices even if other competitors keep their prices unchanged.

2. *Coordinated effects* arise when merging parties coordinate their actions with other competitors in the market and simultaneously increase prices (or reduce production, etc.) leading to consumer harm. Though such coordination between firms may sometimes be explicit in nature, most firms prefer to coordinate subtly i.e. through tacit collusion, to prevent detection.

Most tools employed by anti-trust bodies primarily focus on estimating the likelihood of increased prices post-merger i.e. the impact of unilateral effects. However, as a tool to measure the impact of coordinated effects, several antitrust agencies have also begun to focus on the

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[40] Combination under the Competition Act, 2002 means acquisition of control, shares, voting rights or assets, acquisition of control by a person over an enterprise where such person has direct or indirect control over another enterprise engaged in competing businesses, and mergers and amalgamations between or amongst enterprises when the combining parties exceed the thresholds set in the Act

identification of "maverick" firms pre-merger. This development is based on the ***"maverick-firm" theory of harm***, which proposes that a "maverick" plays a ***disruptive role*** in the market to the benefit of consumers, by employing independent business strategies such as aggressive pricing, etc. Thus, such a firm would need to be protected from being eliminated since its independent strategies reduce the probability of tacit collusion amongst its competitors in the relevant market.

In the recent past, there have been variations noted in the definition of "maverick" as used by global regulatory bodies. This is primarily due to differences in the term "disruption" as defined across various merger guidelines. But it is clear from the growing global applications of the theory that a "maverick's" role in pre-merger assessment is relevant to determining the extent of coordinated effects. Regulators have often used the theory as an additional concept to supplement other evidence of anti-competitive behavior rather than direct evidence of coordinated effects, mainly due to the broad scope of the definition.

There has been a rapid increase in the number of firms disrupting various Indian markets, due to innovative business models, differing price strategies, etc. and the impact of such disruption has been notable. Therefore, it is essential to take into account the possibility of a "maverick" existing amongst these disruptors during merger assessment.

Based on the above, in the next few sections, this paper will attempt to do the following:

I   Study and compare the various global merger assessment guidelines surrounding the definition of a "maverick", as well as their subsequent practical application.

II Critically analyse the constituents of the "disruption" parameter that has been used across various guidelines to define a "maverick".

III Assess the theory of "disruptive innovation" as an additional parameter through which a maverick firm might be distinguished from a conventional disruptor.

IV Lay down specific characteristics of a "maverick" basis prevalent merger guidelines and the theory of "disruptive innovation".

V   Explore certain case scenarios in the Indian context in order to gauge the incidence of hypothetical mavericks based on identified characteristics of a "maverick" firm.

I   Global merger guidelines to identify "mavericks" and their subsequent application

The definition of the word "maverick" varies across global regulatory agencies, with a common aspect appearing to be the "disruptive role" played by such a firm. Global guidelines base their assessment on the idea that the elimination of such a disruptive firm, post-merger, would be more likely to induce anti-competitive harm in the market.

The United States (US) Horizontal Merger Guidelines[41], used by the country's federal agencies, detail numerous criteria for the identification of a maverick firm. The list of criteria identified by the US Guidelines is comprehensive, including most of the parameters considered by other merger guidelines while identifying a "maverick".

According to the ***US Horizontal Merger Guidelines*** (2002), a maverick is a firm with "a greater economic incentive to deviate from the terms of coordination than do most of [its] rivals." The Merger Guidelines, updated in 2010, defined a maverick in further detail as a firm that "plays a disruptive role in the market to the benefit of customers", but did not explicitly explain the meaning of "disruption" in this context. However, the 2010 Guidelines do provide a list of traits to identify "maverick" behavior that is as follows:

1) Threatens to disrupt market conditions with a new technology or business model;

2) Has the incentive to take the lead in price cutting;

3) Has the ability and incentive to expand production rapidly using available capacity;

4) Has often resisted otherwise prevailing industry norms to cooperate on price setting or other terms of competition.

Based on these guidelines, the maverick firm theory was used by the Department of Justice (DOJ) in 2011, during the proposed AT&T/T-Mobile merger[42]. AT&T Inc., the then second-largest mobile wireless telecommunications services provider was seeking to acquire the then fourth-largest service provider T-Mobile USA, Inc. The DOJ listed evidence to draw the fact that T-Mobile could be characterized as an "aggressive competitor" that had come to position itself as a "value option" in the market due to its low-priced phones, superior customer service, etc. Thus, the DOJ stated that it was engaging in a "challenger" strategy that could be considered as disruptive in the market and opposed the merger on the basis of the above.

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41 U.S. Department of Justice and the Federal Trade Commission, Horizontal Merger Guidelines (2010)
 (https://www.justice.gov/atr/horizontal-merger-guidelines-08192010#2f)
42 Case : 1:11-cv-01560, Department of Justice, United States

Similarly, in 2013, the DOJ contested the merger of ABI (Anheuser-Busch) and Modelo (Grupo Modelo)[43], two non-US owned beer companies. ABI, the largest beer brewer in the US, occupying 39% of market share, was seeking to acquire Modelo, having only 7% of market share. However, upon further scrutiny of Modelo's past performance, it was revealed that the company had previously constrained price increases initiated by ABI and MillerCoors, another large player. The complaint also alleged that Modelo had spurred ABI to broaden its product portfolio. Therefore, considering the listed evidence, the DOJ identified Modelo as a "maverick" and as playing a "disruptive" role in the industry. The DOJ also alleged that the Modelo- ABI merger would result in increased concentration in an already highly concentrated industry.

Similar considerations have also been given importance in Australia and Europe, with practical evidences noted in merger assessments by the Australian Competition and Consumer Commission (ACCC) and the European Union Competition Commission.

According to the *Australia Merger Guidelines[44]*, a "maverick" is defined as a "vigorous and effective" competitor who drives price, innovation, product development and other significant aspects of competition despite having a moderate market share. According to these Guidelines, these types of firms are more unpredictable in nature and increase consumer welfare not only through their own products but by also nudging other market competitors into providing better and cheaper products in the market.

The use of the concept in Australia was demonstrated through the opposition raised by the ACCC in 2010, towards the acquisition of **Newreg Pty Ltd by Link Market Services**[45]**,** two securities registry service providers. The evidence laid down by the agency to support the anti-competitiveness of the proposed acquisition was on the basis of several parameters such as increased market concentration and concerns pertaining to entry barriers in the market. However, the ACCC also stated that Newreg was a "maverick" firm, whose aggressive marketing campaigns and significant discounts had led to a wide customer base.

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[43] Case : 1:13-cv-00127-RWR, Department of Justice, United States
[44] Australian Competition & Consumer Commission, Merger Guidelines (2008)
 (https://www.accc.gov.au/publications/merger-guidelines)
[45] Ref No. : 38778, Australian Competition & Consumer Commission (https://www.accc.gov.au/public-
 registers/mergers-registers/public-informal-merger-reviews/link-market-services-limited-proposed-
 acquisition-of-newreg-pty-limited)

The acquisition, stated the ACCC, would eliminate the growing competitors and enable the two largest market players (Link and its closest rival Computershare) to increase prices without the pressure to improve their services.

Though the ***European Union Merger Guidelines***[46] do not provide a clear definition for the identification of a maverick, they attempt to emphasise the "disruptive role" of such a firm, stating that a "maverick" is a firm "failing to follow price increases by its competitors" or "has characteristics that gives it an incentive to favour different strategic choices than its coordinating competitors".

In light of the above guidelines, the European Commission restricted a merger of two telecom firms, T Mobile Austria and Tele.ring in 2006[47]. Post its investigation, the Commission found that Tele.ring exerted a considerable competitive pressure on its competitors (including T-Mobile) by restricting its pricing behaviour, a strategy that had helped the market to be competitive. Therefore, the assessment suggested that Tele.ring had been performing a role of a maverick in the market and that a merger of the two entities would impede effective competition.

Similar descriptions for "maverick" firms have also been found in merger assessment guidelines of Canada, New Zealand and Ireland. Thus, numerous merger guidelines have recognized the potential role of mavericks in stimulating competition in the relevant market and the implications of the elimination of such a firm post-merger.

II   Are all disruptors "mavericks"?

In light of the above definitions put forth in various global merger guidelines, it is evident that there are certain common "disruptive" features i.e. through the adoption of different strategies. However, not all "disruptive" features could be associated to that of a "maverick" who would require protection from elimination. We have presented two cases below to better explain instances where a firm's disruptive behaviour would not label it as a "maverick".

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[46] Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings
(https://eur-lex.europa.eu/legal content/EN/ALL/?uri=CELEX%3A52004XC0205%2802%29)
[47] Case No. COMP/M.3916, Regulation EC No. 139/2004, Merger Procedure, European Commission

Case 1:

The ability to resist prevalent price setting norms in the market and instead take the lead in price cutting is a characteristic of a maverick firm that appears to be the most common across various guidelines. However, it is not unusual for a firm to attempt to vigorously compete by significantly dropping its prices in order to capture a larger market share. While this drop in prices would lead to a fall in profit margins in the short run, a firm would expect a rapid increase in market share as a result of the same, which would in the long run compensate for the loss in profit margins. Thus, this fall in prices is not an uncommon business strategy across industries and the label of a "maverick" firm cannot be attributable to every price cutting player in the market.

Case 2:

Most guidelines also propose that a "maverick" would be one that has the ability and incentive to expand production rapidly using its available capacity. In this regard, the maverick firm would be able to offer a larger supply as well as a potentially wider range of products that would incentivize its competitors to follow lead in order to maintain their market share. However, a firm having deep pockets - such as a subsidiary of a large organization having businesses across industries - would have a greater ability to expand production capacity (and also simultaneously undercut prices) by making use of the available financial resources from gains noted in other industries. However, such a firm would not require it to be protected from elimination during merger assessment. In fact, due its deep pockets, it is likely that its ability to expand production capacity would continue to exist post a merger, since this would be an inexhaustible and transferrable facet. Thus, the merged firm would continue playing the same role it did pre-merger, while in fact expanding its market share and potentially threatening market dominance.

From the two cases above, it is clear that while a firm might be adopting price cutting or supply strategies that are "disruptive" to the relevant market, it is not necessary that such a firm would be a "maverick", requiring protection from elimination.

Thus, it is imperative to further explore the disruptive nature of a maverick in particular. In this regard, the ***business management theory of disruptive innovation*** proposes certain features of a firm that could more closely help us identify the presence of a "maverick".

***The theory of disruptive innovation[48]*,** introduced by **Dr. Clayton Christensen** in 1995, proposes that a smaller company that has access to limited resources can uproot an already established, thriving firm by focusing on untapped segments of the market that have previously been neglected by incumbents in the market, who have been focusing their resources on already profitable areas.

The theory states, that as a result of the focus on a previously untouched segment, the smaller firm manages to create a wide base based on the bottom slab of the market pyramid. Using newer, innovative technologies, it delivers "good-enough" products to the established player's overlooked customers at lower prices. In the process of doing so, it manages to also move up the ladder as it gains an increasingly wide customer base. In certain cases, a disruptive entrant could also create a market that originally did not exist, i.e. by creating consumers out of non-consumers.
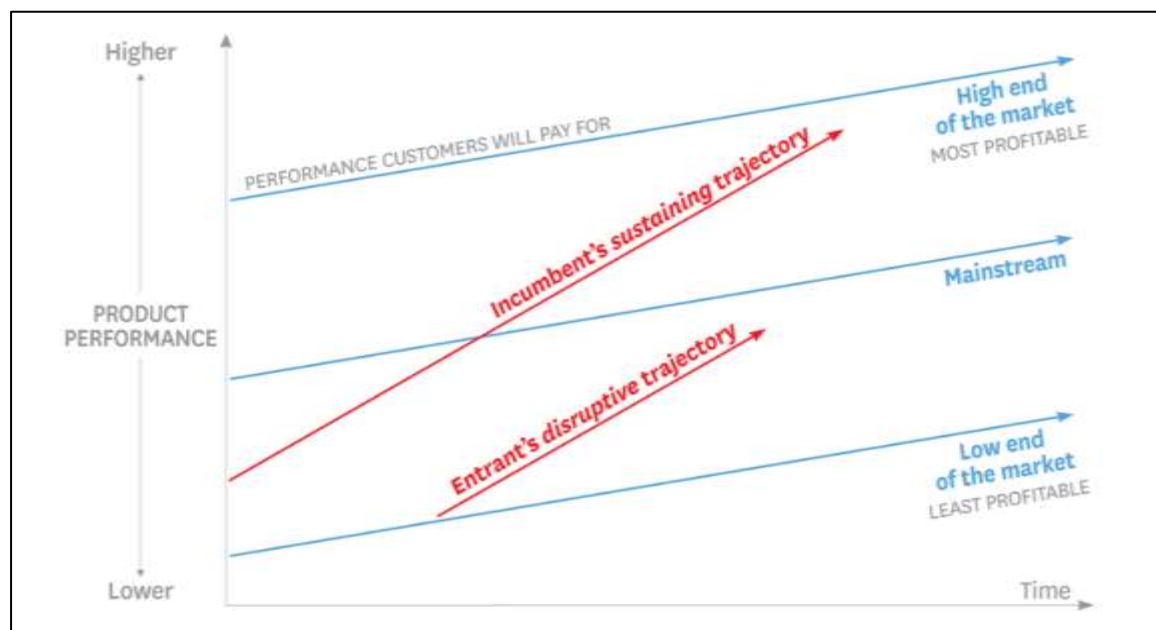
Thus, a disruptive firm, in the context of the theory proposed by Christensen, would provide a larger, more widespread base of customers an increased access to products at much lower prices, allowing them to also engage actively in an industry that they would have ordinarily not been able to benefit from. Additionally, through slow growth, the firm would also force incumbents in the market to innovate and expand in order to stay competitive.

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[48] Christensen, C. M., Raynor, M. E., & McDonald, R. (2016, December 19). What Is Disruptive Innovation? Retrieved from https://hbr.org/2015/12/what-is-disruptive-innovation.

Thus, the elimination of such a disruptor, especially during its early stages of entry, would cause high anti-competitive harm to the market, by not only counteracting innovation in the product market, but by preventing an entire customer segment's access to low-costing innovative products that they would not have had under other circumstances.

The business management of disruptive innovation is more relevant in times where innovation driven by technological upgradation has left no dearth of possibilities in product variation. Thus, in such an environment, the protection of a maverick from elimination would be of increased importance.

III "Mavericks" through the lens of disruptive innovation

As explored in the previous section, common "disruptive" tendencies in the market does not imply that the firm is a "maverick". Therefore, this section attempts to explore the theory of "disruptive innovation" through an assessment of the existing merger guidelines, which would help us to better understand the difference between a "maverick" versus a conventional disruptor. Since the merger guidelines belonging to the United States offer the most comprehensive definition of a "maverick", that incorporate characteristics observed in other guidelines as well, we shall evaluate the "disruptive innovation" theory using the United States Horizontal Merger Guidelines (2010).

The US guidelines mention four criteria that could be used to determine a maverick in the market that have been assessed along with the theory of disruptive innovation in the following manner:

1) *Threatens to disrupt market conditions with a new technology or business model that caters to a new or previously overlooked customer segment*

   The US merger guidelines state that the maverick firm would be one that utilizes a new technology or business model. However, what is most relevant to the prevention of anti-competitive harm is whether this new technology or business model is solely to the advantage of previously thriving customers. It is important to note whether, as a result of its creation, such a business model would also increase consumer welfare by providing access to a new customer base.

As stated previously, disruptive innovation occurs when an entrant in the market caters to low demanding or previously non-existing segments of the market. These are segments that have in the past usually been overlooked by incumbents, due to their focus on profit maximisation and creating high quality products.

2) *Has an incentive to take the lead in price cutting by offering lower quality products*

The guidelines note that a "maverick" is one that usually has the ability to restrict price increase, in contrast to its competitors. However, as analysed previously, possessing exclusively the ability to retain low prices does not warrant the "maverick" label.

In addition, using the theory of disruptive innovation, a maverick firm would be the one taking the lead in price cutting because it would be providing lower quality products at reduced prices to its customer segment. This segment would otherwise not have had access to the market since the incumbents price their products much higher. Thus, the maverick would differ in its approach by keeping prices low in order to focus on meeting the demands of its segment in particular.

3) *Has the ability and incentive to expand production rapidly using available capacity in order to increase market access*

According to the US guidelines, a maverick firm can be identified as the market player that can easily expand its production in contrast to other players. However, as stated previously, it is possible for a firm to have deep pockets, and hence, an inherent ability to expand. This would not necessarily imply that it is a "maverick" in its market.

On the other hand, applying the theory of disruptive innovation to the above guideline, we would note that an entrant in the market would be able to scale up rapidly as a result of its innovative strategies. Thus, while in earlier stages, it would cater to the lower segment of the market, its pace of expansion would be quick in terms of providing access to an increasing number of customers by substantially broadening its existing capacity.

4) *Has often resisted otherwise prevailing industry norms to cooperate on price setting or other terms of competition since it focuses on a particular overlooked segment of the market*

The US guidelines identify a maverick as one that would prevent the rise of tacit collusion in the market by refusing to cooperate on price setting norms or other mutually advantageous pacts.

The disruptive innovation theory would further add that an innovator would have no incentive to coordinate its strategies with incumbents. This is because meeting the demand of its customer segment through lower quality products and reduced prices would provide the disruptive innovator an edge and help the firm establish a strong foothold in the relevant market. Thus, it would have no benefit from colluding with its competitors.

Thus, the above assessment provides further additions to features previously laid down in order to help distinguish a "maverick" from a disruptor. A "maverick" is one that establishes a new technology or business model catering to a fresh segment of customers. These customers are offered products, albeit lower quality ones, at reduced prices, providing them access to the market. Thus, a "maverick" is responsible for generating consumer welfare.

The acquisition of such a "maverick" would then result in its technology being discarded as an acquiring firm would alter the strategy in alignment with its own and focus on its customer segments. Since consumers who earlier had access to lower quality products at reduced prices would have to pay more for high quality ones, there would be an increase in the price in the short run and would eventually result in consumer harm.

IV Do "maverick-like" tendencies exist in the Indian scenario?

As defined in the previous section, a company having "maverick" tendencies would be one responsible for promoting consumer welfare through the establishment of a new technology or business model that offers lower quality at reduced prices to new customers segments.

In light of this definition, this sections aims to identify hypothetical examples of companies exhibiting "maverick" tendencies. Thus, the two case scenarios being

explored below only aim to highlight the type of behaviour a "maverick" could be displaying, that would distinguish it from its competitors.

1. <u>**Hypothetical Case Scenario: Smartphone industry**</u>

In 2014, Micromax was the 10th largest smartphone manufacturer in the world and was one of the largest domestic companies to exist in the low-cost handset feature segment. It had a higher customer base in rural India and occupied 22% of market share in the smartphone segment. Having entered directly by catering to the lower market segment, the company rapidly adapted to the changing Indian market dynamics through the introduction of feature rich smartphones such as long battery life, dual sim, etc. and made them available at the least cost. Aware of the electricity penetration in rural India, Micromax identified that the main demand of its segmental customers was to have access to phones with longer battery life. This prompted Micromax to launch its first smartphone with longer battery life and enabled them to penetrate quickly in the rural market.

Thus, though the features of the company's handsets in terms of quality did not match that of high-end competitors such as Samsung, the use of the same operating system i.e Android created a level playing field, since the basic functionality offered was equivalent for all smartphones existing in the market. Micromax followed a unique marketing strategy to increase its sales by targeting budget shoppers. It identified the price conscious nature of the Indian market, even if at the cost of compromising on brand value. Thus, it frequently innovated and introduced handsets which were lower in quality as compared to those of its competitors and instead focused on exceeding its consumers' demands in terms of its configuration. It further focused on reaching the masses by having an extensive supply chain all across rural India in small shops. In contrast, its incumbent branded competitors did not have an extensive distribution network. By 2015, Micromax had eventually beaten Samsung in terms of its market share.

Eventually, the company went into high losses as a result of intense competition from Chinese handset makers. However, the company is an interesting example of a disruptive entrant providing low-cost alternatives to an untapped segment of the Indian market. By designing innovative technology designed specifically to meet the segment's needs, it was also able to expand rapidly within the country. In this context, the potential acquisition of such an innovator by another smartphone manufacturer would have resulted in competitive

harm since Micromax's technology catering to the budget shoppers would have been discarded in exchange for the incumbent's technology designed to meet the high quality demand of its customers. It would also adversely impact consumer welfare since the least demanding customers would now have to pay a higher price to have access to a higher quality product of lesser use to them than Micromax's customized specifications.

2. **Hypothetical Case Scenario : Soap and detergent industry**

The detergent segment of India over several years been occupied by Hindustan Unilever Ltd. (HUL) with it originally dominating all the three segments; the premium market, the mid-market and the popular market. However, since recent times, RSPL Limited's product, Ghari has taken over the popular segment while HUL now controls the premium and mid-market. Ghari is now bigger than all its previous competitors in the popular segment i.e. Wheel, Sunlight and Nirma and now commands a share of nearly 22% in the detergent market and stands second behind the market leader, HUL.

Ghari's followed its competitor Nirma's business model by keeping the prices lower and targeting customers belonging to the bottom-most slab of the market. This eventually brought a revolution in the lower market segment as the customers slowly shifted from soaps to detergent powder due to its lower price. Ghari still costs much lower than the same product category of its immediate competitors. As per online food and grocery stores in India, Ghari detergent powder is currently priced at INR 54 per kg. On the other hand, HUL's highest selling detergent powder, Surf Excel, is priced at INR 113 per kg i.e. a difference of 52% in their prices.

Once RSPL became aware of the growing demand for machine-wash laundry detergents, it further encouraged the company to penetrate deeper into the market through the expansion of its network, especially in the rural segment. Realizing the abundant market potential, RSPL set up its manufacturing units near consumption centres, enabling it to lower its cost of freight. Further, RSPL provided a profit margin of 6-7% to its wholesale and stock keepers compared to its incumbents providing 5% profit margin which enabled it to have a stronger supplier base and distribution network while limiting higher prices. RSPL also kept its promotion and advertising expenses to 6-7% of operating income, much lower than its competitors' expenditure of 12-14%.

Thus RSPL's product, Ghari's growth story is evidence that the firm has displayed "maverick" characteristics, by employing a disruptive "new business model" and by keeping prices low in order to cater to a specific market segment. By doing so, it has also been able to increasingly move upwards and penetrate into other segments of the market by expanding its distribution networks and sales. It has eventually been able to witness rampant growth and has taken over the market segment that was once dominated by an incumbent. Thus, Ghari continues to cater to a lower segment of the market but has broadened its reach over time to become a viable threat to competitors in the prime market. Thus, the elimination of such a competitor through a merger would need to be protected by a regulator in order to ensure that the product continues to be provided to those who can afford only its low-priced substitutions.

Thus, from the above two cases, it is evident that companies in the past have displayed common "maverick" tendencies of disruptive innovation coupled with low cost products catering to a different, new segment of the market. In both cases, the companies have resisted following the existing industry norms prevailing in their respective product markets and have eventually worked their way up the industry ladder to become prospective threats to major incumbents in their markets.

V   Conclusion

Thus, the "maverick" firm theory of anticompetitive harm appears to be an important merger assessment tool to understand whether the elimination of such a firm through a merger could have detrimental effects on competition. However, despite playing an increasing role in merger assessments across the world, the characteristic features of a "maverick" have not always been explicitly defined. Based on our review of global literature, it is evident that merger guidelines across the world have laid down certain basic parameters that could be starting points in the identification of a maverick by a regulatory body.

In this process of identification of a "maverick", of relevance is the theory of "disruptive innovation" that would aid a regulatory body in going beyond the existing criteria to better identify cases of mavericks in the market. Based on cited examples, disruptive behaviour by maverick firms has been witnessed with firms offering a product or service of lower quality than its incumbents, but performing better due to their ability to fulfil the needs of

the unserved customers through their common strategy of trading off higher performance in favour of lower prices. In the process, such firms have been able to substantially increase consumer welfare in their respective markets, by tapping neglected segments through breakthrough innovations.

In the context of the significant advantages that exist in the market due to the presence of a "maverick" firm, acquisition or elimination of such firms may lead to adverse competitive effects such that the newly merged entity and its competitors may coordinate on price, output, capacity and or any other terms of competition leading to harm in the following manner:

1) Threatens to disrupt market conditions with a new technology or business model *that caters to a new or previously overlooked customer segment*
2) *Has an incentive to take the lead in price cutting by offering* **lower quality products**
3) Has the ability and incentive to expand production rapidly using available capacity *in order to increase market access*
4) Has often resisted otherwise prevailing industry norms to cooperate on price setting or other terms of competition *since it focuses on a particular overlooked segment of the market*

Recently, the concept of "innovation" has become more prominent in merger review by several regulatory authorities across the world including The Competition Act, 2002, which notes "nature and extent of innovation" as one of the factors in deciding Appreciable and Adverse Effect on Competition (AACE) in Indian markets.

Thus, identifying a firm causing significant disruption by creating a niche space for itself through innovative products, strategies as well as segments would be of increasing relevance. We believe that the application of this concept is of relatively more important in India, due to the country's diverse customer segments. By providing access to lower quality products at lower costs, these "mavericks" have opened up the previously constrained market to an entirely new set of consumers that in India, would occupy a significant share of the population. Thus, the possibility of "mavericks" existing in the Indian scenario is greater and should be protected from elimination by a regulator during merger assessment.

APPLICATION OF EVENT STUDIES IN COMPETITION ENFORCEMENT AND DAMAGES ASSESSMENT

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Abstract

The use of stock prices to ascertain the impact of events is very well established in the academic literature. Attempts have also been made to adapt this method for assessing the competitive effects of mergers and other actions of firms. However, its use in issues involving competition enforcement has remained limited. The increase in number of large mergers as well as the increasing complexity of conduct investigations due to the evolving business models and availability of large data sets, has made the job of competition authorities as well as the firms under investigation more difficult. Given this, our paper seeks to revisit the event study methodology and assess whether it can be employed in complex mergers and investigations to derive insights, which might otherwise be difficult to obtain through traditional methodologies. Our review of the literature as well as our experience of applying this methodology in a variety of contexts reveals that it has applications relating to both merger and conduct investigations. Our research and practical experience also reveals that it is not feasible to apply this methodology for assessment of follow-on damages.

1. Introduction to event studies

Definition

Event studies are aimed at estimating the impact of an event on the share price of a company. Event studies are predicated on the *efficient markets hypothesis*, which holds that a firm's share price is an unbiased estimate of the present value of its expected future cash flows per share. In other words, it implies that if an event causes a change in the investors' expectations about the firm's future cash flows, then this would also result in a change in the share price of the firm. The change in share price, which is attributable to the event, is known as the *abnormal return* and is the key output of event studies.

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Event studies, therefore, assess the impact of an event on the firm and the wider market by estimating the abnormal returns emanating from the said event.

Performing an event study

Identifying the event

The first step in performing an event study is to define the event whose impact we want to assess. For instance, for the purpose of assessing the competitive effect of a merger, one of the relevant events could be the announcement of the merger by the parties. Generally, the event should be such that:

(1)   it contains information that was not known to the market before;

(2)   the time of its occurrence is known; and

(3)   It does not include the impact of any other event, whose impact needs to be isolated and excluded. In other words, the event is independent of all other events that the researcher might be interested in analysing.

Defining the event window

The second step involves defining the time frame within which the event is expected to have an effect on the share price of the company. The actual stock returns are calculated during the event window, and the counterfactual stock returns (the stock returns but for the event, or *normal returns*) are estimated as part of the event study. The event window depends on the time that it takes for the news to reach the investors and for them to adjust their expectations about the firm's future cash flows.

Event window can also start before the actual event occurs (or news is made public) if there is a chance that the news was leaked somehow. Similarly, the event window can extend until after the actual event. A broad event window carries the risk of including additional effects on the stock price, which might be unrelated to the event of interest. Therefore, care must be exercised while choosing the event window.

Isolating the industry and firm-specific effects

In order to estimate the share price movements solely attributable to the identified event, the impact of other factors on the share price of the firm need to be isolated. Two types of effects might need to be controlled for: (1) industry/market effects, for instance any announcement regarding the general macro environment; and/or (2) other firm-specific events such as better than expected earnings, corporate M&A etc.

One way of isolating for industry effects is to study the relationship between the share price and the movement of benchmark market/industry indices. The choice of the appropriate index depends in the closeness of the historical relationship between the share price of the firm and the index, which can be ascertained from the R-square of the linear regression between the two.

If there are other firm-specific events during the event window, then their impact needs to be controlled for and isolated as well. How this can be done depends on the exact event that needs to be controlled for. For instance, if we need to control for better than expected earnings, we might study the relationship between the share price of the stock and similar instances of better than expected earnings from the past. This relationship can then be included in the abnormal return model or alternatively, the average effect of such an event can be subtracted from the total return.

After deciding the relevant benchmarks for controlling the industry and firm-specific events, we need to decide the time period over which the relationship between the share price and these benchmarks needs to be studied or during which the regression needs to be performed. This time frame, known as the *estimation window*, typically covers the period before the event window. The length of the estimation window typically varies from three months to one year, and sensitivity analysis is often undertaken to determine the optimal length.

Estimating the impact of the event

As noted above, the variable of interest in an event study is the *abnormal return*. This is generally estimated using a cumulative abnormal return ("**CAR**") approach. Under this approach:

(1) the relationship between the movement of the underlying stock and the relevant benchmark index is estimated using equation (i) below; then

(2) the expected return (**ER$_t$**) is calculated by using the results of equation (i), as illustrated in equation (ii) below; and finally

(3) the abnormal return (**AR$_t$**) is calculated by subtracting the expected return from the total return, as demonstrated in equation (iii) below.

$$(i) \ R_t = \ \alpha + \beta M_t + \varepsilon_{it}$$

R$_t$ corresponds to the total return on the company's stock during the duration t, where t could be a day, week, month etc.; M$_t$ is the return on the benchmark market/industry index during the duration t; and □□is the estimated coefficient equal to the amount by which the total stock return of the company changes upon one percentage point change in the benchmark index. This is known as the "Market Model".

$$(ii) \ ER_t = \alpha + \beta M_t$$

$$(iii) \ AR_t = R_t - ER_t$$

Equation (i) is estimated over the *estimation period,* using daily, weekly or monthly data. Equations (ii) and (iii) are calculated for each of the time periods in the event window and the abnormal returns so obtained are multiplied to estimate the CAR.

It should be noted that the above analysis does not include variables to control for any additional firm-specific events during the event window whose impact we might want to isolate. Depending on the context, an additional equation can be estimated, which controls for additional firm-specific events.

Potential applications of event studies

The event study methodology discussed above has applications across competition enforcement and damages assessment. Such studies can be used to assess the impact of merger and investigation-related events on the stock returns of firms under investigation as well as their publicly-listed rivals. This in turn can provide insights on the expected impact of enforcement actions on the future cash flows of the firm, which, as we will see below, has implications for the market structure and competition in the market. Such insights can further be used as a cross check for merger assessment or for estimating the long-term impact of investigations on shareholder wealth.

Event studies can also be potentially used to estimate damages arising from various illegal conduct. However, as we demonstrate below, it is difficult to apply event studies for assessing follow-on damages.

We discuss the application of event studies in merger enforcement, conduct investigations and damages assessment in Sections 2, 3 and 4 respectively.

2. Application of event studies in merger assessment
Introduction

Event studies have two primary applications relating to merger enforcement:
(1) First, they can be used to assess the value expected to be created or destroyed by a merger, which in turn is used as a cross check to assess the competitive effects of a merger; and
(2) Second, they can be used to assess how merger enforcement affects shareholder wealth in the long run. This might be specially relevant to assess the overall costs of investigating mergers, which did not turn out to be anti-competitive after detailed investigation. In effect, it can be used to ascertain the efficiency of the merger enforcement regime.

In the sub-sections that follow, we discuss the existing literature as well as the detailed methodology employed for aforementioned applications. We also discuss the issues that one should be careful about while using event studies in merger investigations.

Literature and methodology

As discussed above, the variable of interest in event studies is the abnormal return. Researchers in this field have attempted to analyse abnormal returns, alongside existing industrial organisation theory, to provide empirical support for various phenomena relating to competition enforcement. Early research put forward two broad hypotheses relating to the abnormal returns associated with merger-related events. These include the:

(1) **Market power hypothesis**, which holds that the merged entity will be able to exercise more market power due to which its future profits and cash flows will increase. This will be reflected in abnormally high returns on its stock; and

(2) **Efficiency hypothesis**, which holds that merger efficiencies will lead to lower costs or higher market share for the merged entity, thereby increasing its future profits and cash flows. This will be reflected in abnormally high returns on its stock.

The hypotheses above imply different things about an abnormally high return resulting from merger-related events - while the market power hypothesis ties the abnormally high return to an anti-competitive merger, the efficiency hypothesis ties it to a pro-competitive one. Therefore, looking solely at the abnormal returns of the merging parties will not allow us to draw a definitive conclusion about the competitive effects of a merger.

To get around this problem, Eckbo (1983) and Stillman (1983) devised a methodology that involves an analysis of the abnormal returns of the rivals of merging entities. This method is premised on the following hypotheses:

(1) an anti-competitive merger will cause industry prices to increase[52], leading to increased future cash flows for rival firms, which would be reflected in abnormally high returns from events that increase the probability of the merger ("**collusion hypothesis**"); and

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[52] Either due to explicit collusion or parallel pricing resulting from increased concentration.

(2)   that a pro-competitive (or efficiency enhancing) merger will lead to increased competition in the industry[53], leading to lower future cash flows for rival firms, which would be reflected in abnormally low returns from events that increase the probability of the merger ("**efficiency hypothesis**").

To sum up, this hypothesis holds that an:

(1)   abnormally high return to both, the merging as well as the listed rival firms, implies that the market expects the merger to lead to an increase in prices. This is indicative of an anti-competitive merger; and

(2)   abnormally high return to merging firms[54] and an abnormally low return on listed rival firms implies that the market expects the merger to lead to efficiencies and a decrease in prices. This is indicative of a pro-competitive merger.

The existing industrial organisation theory, in particular oligopoly theory, holds that a decline in the number of firms leads to an increase in industry prices, all else being equal. The same theory also predicts a reduction in industry prices as a result of a decline in average/marginal costs, all else being equal. Therefore, conclusions derived from event studies about the competitive effects of mergers, including the hypotheses noted above, are grounded in the existing industrial organisation literature.

Stillman (1983) employed this methodology to test whether the mergers challenged by the Department of Justice ("**DOJ**") and Federal Trade Commission ("**FTC**") in the US were expected to lead to higher prices but for the challenge by the DOJ/FTC.[55] The author performs an event study on 11 mergers challenged between 1964 and 1972, which satisfied certain additional criteria. Out of these mergers, Stillman found that the rivals in only one of them had statistically significant positive abnormal returns, which were consistent with (1) above. Stillman concludes, therefore, that only one of the 11 challenged mergers was expected to lead to higher industry prices.

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[53]   Due, among other things, to the merged entity passing on a portion of its cost efficiencies to the consumers.

[54]   From increased margins and/or a higher market share.

[55]   The author assessed this by analysing the abnormal return to merging parties from initial merger-related events, before the antitrust challenge.

Eckbo (1983) considers an additional explanation for abnormally high returns to rivals of merging parties. The author notes that this return can also be attributed to productive efficiency that might result from disclosures made in the merger as well as the market expectations regarding future mergers among rival firms.[56] The paper analyses abnormal returns on 65 mergers challenged by the DOJ/FTC and several unchallenged mergers between 1963 and 1978 and rejects the collusion hypothesis for challenged mergers. Eckbo finds that while the rival firms experience a positive abnormal return upon the initial announcement of mergers, they do not experience a negative abnormal return when the same mergers are challenged by the regulator. This is taken to mean that the positive abnormal return to rivals at the time of the merger announcement does not result from expectations about future collusion but from productive efficiencies that are expected to accrue to rival firms either from the merger disclosure or from any future consolidation. Therefore, the paper concludes that the mergers challenged by DOJ/FTC were not expected to lead to anti-competitive outcomes.

Both Eckbo (1983) as well as Stillman (1983) are aimed at assessing the efficacy of the DOJ/FTC merger regime with reference to event studies. These studies conclude that most of the challenged mergers analysed by them were not expected by capital markets to lead to anti-competitive outcomes. In other words, they conclude that DOJ and FTC investigated mergers which were seen to be either harmless or welfare enhancing by capital markets.

Although Eckbo (1983) and Stillman (1983) employ event studies for post-facto analysis of merger investigations, it is also possible to use event studies as an initial screen before launching an in-depth investigation or as a broad cross-check to other initial screens. Event studies have certain advantages in this respect, which we discuss in the paragraph below.

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[56] Eckbo cites Jarrell and Bradley (1980) to support this claim.

Typically, merger assessment is performed with respect to the expected increase in prices of products with horizontal overlap. However, as Eckbo (1983) notes, it is possible for increase in post-merger price to be accompanied by increased competition in non-price factors such as quality of product and service. Since event studies assess the effect of mergers with respect to the expected change in cash flow, they likely capture the impact of both, price and non-price factors. This precludes the need to separately assess non-price factors in a merger investigation.

Issues relating to application of event studies in merger enforcement

In the sub-sections above, we noted the potential applications as well as the conclusions from research papers that have employed event studies to assess the competitive effect of mergers. However, there are certain factors which might limit the applicability of event studies and/or reduce the reliability of the conclusions derived from their application. We discuss these issues below.

As noted above, the methodology employed by Eckbo and Stillman is based on the abnormal returns earned by rival firms of merging parties. This methodology assumes that the share prices of rival firms will show a statistically significant reaction if the merger-related event is expected to have an impact on the competitive scenario. However, this might not be the case if only a small proportion of the rival firms' operations belong to the sector in which the merging parties have a horizontal overlap. In such situations, the rival firms might not experience statistically significant abnormal returns, making the application of event studies difficult.

Further, Stillman (1983) cites Williamson (1968) and notes that it is possible for an increase in total social welfare to be accompanied by an increase in the product prices in an industry. This happens when the merger reduces the marginal costs of the merged entity but increases its pricing power in a manner that the increase in the firms' profits (or producer surplus) more than compensates for the distortion caused by the increase in industry prices. In such a situation, the methodology discussed above for assessing the competitive effect of mergers will incorrectly characterize an abnormally high return on both merging and rival firms as being consistent with the collusion hypothesis.

Finally, post-facto analysis using event studies is prone to sample selection bias, as a strict enforcement policy could have likely deterred firms from attempting anti-competitive mergers.

3. Event studies and conduct investigations

Introduction

The event study methodology discussed in the previous sections can also be applied in other areas of competition enforcement, including anti-competitive agreements and abuse of dominance investigations. Event studies have three primary applications relating to conduct investigations:

(1)   First, similar to merger investigations, they can be used to ascertain the value created or destroyed by various events relating to the investigations (launch of investigation, prima facie case, etc). These in turn can be used to assess the long run impact of such investigations on shareholder wealth;

(2)   Second, post-facto analysis can be used to estimate the profits that the infringers expected to earn from engaging in illegal conduct. This can further inform the penalty amount that would increase the deterrence power of enforcement; and

(3)   Third, event studies can be used to study the underlying motivations and effects of conducts which are not per se illegal, for instance, resale price maintenance.

Literature and methodology

Bosch and Eckard (1991) study 57 price fixing indictments, involving 127 firms between 1962 and 1980, and attempt to isolate the causes of the abnormally low returns that follow the indictment announcements. The event study performed by the authors find that the indicted firms experienced a loss of value of USD 2.18 billion. Only 13% of this could be attributed to legal costs[57] while bulk of the remaining amount corresponded to the monopoly profits that would have been earned *but for* the indictment.

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[57]   This includes penalties, follow-on damages and litigation costs.

The insights from Bosch and Eckard (1991) have important implications for competition enforcement in India as well. Firstly, they can be used to test whether the capital markets in India expect competition investigations to lead to lower profits. If such analyse shows significant abnormal returns, then further analyses can be performed to estimate the underlying components of the absolute abnormal returns. The component corresponding to monopoly profits (or the residual abnormal return after subtracting legal costs) can provide a rough estimate of the profits that infringers expected to earn from illegal conduct. These estimates can be used to set the regulatory fines that are imposed for such conduct, with the aim of altering the decision of the potential infringers at the margin and thereby increase the.

Equation (iv) below explains this in detail. Here, **Y** represents the residual abnormal return which represents the expected decline in future profits of the firm.[58, 59] This can be used to estimate the total profits expected to be earned from the illegal conduct throughout the life-cycle of the conduct. This can then be used to arrive at better estimates of penalty amounts for various kinds of conducts, which would alter the incentives to engage in illegal conduct and thereby increase the deterrence of the enforcement regime.

$$(iv)\ \pmb{Abnormal\ return\ (X) = Legal\ costs\ (L) + \ Monopoly\ profits\ (Y)}$$

Event studies can also be used to test various hypotheses relating to the motivations and actual effects of various conducts, which might not be per se illegal. Gilligan (1986) does this for Resale Price Maintenance ("**RPM**"), wherein he analyses the abnormal returns to upstream firms in the US emanating from announcement of 43 RPM investigations. The paper finds that the news of the investigation leads to a negative abnormal return on the upstream firm.

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[58]   While it is possible to broadly estimate the litigation costs, it might be difficult to isolate any follow-on damages amount built into the abnormal return. However, given existing evidence wherein follow-on damages claims are rare India, it is unlikely that they would constitute a large proportion of any abnormal returns.

[59]   We are assuming that the entire residual abnormal return corresponds to expected monopoly profits. As noted in Bosch and Eckard (1991), it is possible for this residual return to include the impact of other factors. However, to the extent that these factors are taken into account by the infringers before engaging in illegal conduct, the analysis above will remain unchanged.

Gilligan (1986) lists four primary motivations behind RPM: (1) a dealer (or downstream) cartel; (2) a manufacturer (or upstream) cartel; (3) price discrimination by the manufacturer; and (4) transaction costs. The author then tests the market's expectation as to which of these motivations were behind the alleged RPM by firms under investigation. He does this by regressing the abnormal returns emanating from the investigation announcement on concentration measures in the upstream and downstream market, as well as on the market share of the upstream firm. This analysis finds evidence for multiple motivations behind the alleged RPM arrangements in the sample, save for price discrimination, which was not compatible with the regression results. Such analyses will be specially helpful where RPM is not per se illegal and where an effects-based approach is adopted for assessing its compatibility with the law.

Issues involved in applying event studies in conduct investigations

We discussed the methodology for assessing the impact of conduct investigations followed in Bosch and Eckard (1991) as well as the methodology in Gilligan (1986) for isolating the underlying motivations for alleged RPM arrangements. In the paragraphs below, some issues that we must guard against while applying these methods in the context of conduct investigations.

First, Bosch and Eckard only analyse the abnormal returns around the announcement of a final indictment. However, there might be other investigation-related events which might have altered the probability of a final indictment or changed the investors' expectations of the future cash flows of the firms under investigation. To the extent that such events led to a negative abnormal return, Bosch and Eckard's analysis will understate the overall loss of value resulting from the investigation.

Second, the total long-term loss in value resulting from an investigation should also account for any change in investor expectations beyond the narrow window around the final indictment. This is because investors might expect the illegal conduct, for instance, a cartel, to re-emerge if the market dynamics change or if the regulatory regime is seen to be weak by the market participants. If this happens, the loss in value resulting from the initial investigation might be reversed in part or even in full.

Third, Gilligan (1986) estimates the abnormal return with respect to the investigation announcements, which might not necessarily relate to a final indictment. This has the potential to both, underestimate as well as overestimate the overall abnormal returns resulting from all investigation-related events. For instance, if the analysis considers an announcement relating to the launch of an investigation but not the one relating to the close of the investigation without an indictment, then the analysis might overestimate the overall impact on the future cash flow of the firm under investigation.

4. Event studies and damages assessment
Introduction

In most jurisdictions, a final finding of infringement of competition law makes the defendants liable for follow-on damages claims. These claims are related to the economic harm caused to other non-infringing parties due to the behaviour of the infringing firms. Similarly, there are other scenarios, for example relating to securities frauds, which make firms liable to damages claims from investors.

As discussed in previous sections, event studies are used to ascertain the expected impact of an event on the expected future cash flows of a firm. Since competition investigation-related events, including a final finding of infringement, give rise to damages claims, a part of the resulting abnormal return on defendants and potential claimants would correspond to these claims. In the sub-sections below, we briefly discuss the benefits of using the event study methodology as against accounting-based methods to estimate damages. We then discuss the practical aspects of applying of event studies in assessing follow-on damages claims.

Event studies vs other approaches to damages

The traditional approach to estimating damages involves a comparison of the (1) financial position of the claimant firms *but for* the illegal conduct ("**but for scenario**"); and (2) their actual financial position ("**actual scenario**"). The implication is that the difference of the two will correspond to the damages suffered by the claimant firms due to the illegal conduct.

The but for financial position is usually ascertained with respect to the internal/ external projections of the company as of the date of assessment of damages or the date when the illegal conduct is alleged to have begun. This is where the event study methodology and the traditional methodology differ most markedly. While the traditional methodology relies on the actual impact of the illegal conduct to estimate damages ("**ex post analysis**"), event studies rely on the expected impact on future cash flows as of the date of the events which confirm the existence of the illegal conduct ("**ex ante analysis**").[60]

There are two primary issues with using the traditional methodology:

(1) First, it assumes that the difference between the actual and projected cash flows is solely attributable to the illegal conduct. This is likely a very strong assumption, given that the firm's cash flows are impacted by various market and industry factors, as also by firm-specific factors such key changes in the management etc. Analysts might try to control for these factors, however, any such exercise would be subject to the biases of the person performing the assessment;

(2) Second, it relies on projections for estimating the cash flows under the but for scenario. These projections are also subjective in nature might be affected by the biases of the person carrying out the projections.

Event studies solve for these two issues by relying on the expected change in the future cash flows of the claimant/defendant firm solely due to the announcements associated with the illegal conduct. Such expectations are less likely to be biased as they represent the collective wisdom of a large number of investors, who have an incentive to accurately predict the impact of the event.[61]

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[60]   Similar terminology and reasoning is used by Tabak and Dunbar (1999).
[61]   This is because the returns to the investors depend, in part, on them forming an informed view of the current and expected share price of the firm affected by the event.

Application of event studies for follow-on damages assessment

In a jurisdiction with well-developed case law, both, potential claimants as well as defendants will likely experience an abnormal return post enforcement decisions. Therefore, event studies can potentially be performed on the defendant as well as the claimant firms for the purpose of isolating the damages amount from the overall abnormal return. Below, we discuss the feasibility of performing this analysis on claimant firms, although similar arguments hold for defendant firms.

Theoretically, potential claimants would observe a positive abnormal return on their stocks due to events which increase the probability of a final indictment and a successful damages claim. These returns correspond to the total impact expected on the claimant's future cash flows from the event(s). The total impact might be a function of the:

(1) **higher future profits which might accrue after the end of the infringement**. For instance, for downstream players, the end of a cartel might mean lower input prices and therefore increased margins; and

(2) **higher future cash flows due to the follow-on damages amount.**

In order to estimate damages, one would have to isolate the damages component from the overall abnormal return. We are not aware of any robust methodology that would allow us to do this in a precise manner. Therefore, it is difficult to use event studies for estimating follow-on damages. However, event study is still a robust methodology for estimating damages in scenarios where the issue of separating the various components of the abnormal return does not arise. For this reason, event studies are quite common in assessing damages arising from securities frauds.

Conclusion

Our review of the literature as well as our practical experience leads us to conclude that the event study methodology does have applications in competition enforcement, specially around merger and conduct investigations. As noted in Section 2, event studies can be used as an initial screen in merger assessment as well as for assessing the efficacy of the regulatory regime.

We demonstrated in Section 3 how event studies can be used to assess long-term loss in shareholder's wealth as a result of conduct investigations. We further demonstrated how event studies can be used to increase the deterrence effect of regulatory fines as well as ascertain the motivations behind various conducts, which are not per se illegal.

The conclusion from Section 4 is interesting as it shows that while it is not feasible to use event studies for follow-on damages assessment, they remain very popular in assessing damages arising from other kinds of illegal conduct.

Our research identifies the exact areas within competition enforcement which might benefit from the event study methodology and where it might be better than the traditional methodologies that are currently being used. We also note the issues involved in applying this methodology in various contexts as well as identify areas where it cannot be applied. This will aid the competition authorities as well as the parties being investigated in choosing the right methodology for the analysis they want to put forward and contribute to the overall efficiency in competition enforcement.

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COMPETITION ASSESSMENT OF MERGERS IN DIGITAL MARKET

- DR. RAMJI TAMARAPPOO[62], MS. NANDITA JAIN [63]

Introduction

Internet, in the 1980s and 90s, gave people across the world, a novel experience of connecting with others digitally. Powered by the Internet, new scientific discoveries such as artificial intelligence, robotics, nanotechnology and the Internet of Things, are today aiming to fuse together the digital, physical and biological worlds. These technological advancements and the resulting convergence of different spheres of life, are propelling what is referred to as the fourth industrial revolution, which is cascading through industries, applications and disciplines.[64]

One of the many outcomes of this revolution is the surge in platform business models or digital platforms. A digital platform is a technology enabled business model that connects consumers with suppliers of goods and services to enable transactions between them. Such platforms today, exist across various sectors such as hospitality, ticketing, shopping, real estate, healthcare, entertainment and so on. Airbnb for instance is a digital platform that connects people who are planning to rent short term accommodation with people who wish to lease such accommodations.[65] Like Airbnb, Facebook, Google, Instagram, Amazon, all are digital platforms that connect stakeholders such as users of varied products and services, their developers, advertisers, content creators, viewers, buyers or sellers.

The power within digital platforms to connect these stakeholders lies with their distinct characteristics like economies of scale, network effects, pricing strategies, dynamic nature and impact on consumer privacy (discussed in the subsequent section). However, these peculiar characteristics also necessitate that policy makers, including competition regulators, examine transactions in this space differently to ensure competition and consumer is not harmed, and at the same time technological advancement is not thwarted.

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[64] Saul Levin," World Economic Forum And The Fourth Industrial Revolution In South Africa", Tips Research Report for Department of Trade And Industry, November 2018, http://www.dti.gov.za/industrial_development/docs/TIPS.pdf

[65] Koskinen Kari, Bonina Carla & Eaton Ben, "Development Implications of Digital Economies", Centre for Development Informatics, Global Development Institute, SEED, 2018, https://diodeweb.files.wordpress.com/2018/10/digital-platforms-diode-paper.pdf

In this paper, we discuss these market characteristics and review how competition authorities in advanced jurisdictions have addressed concerns that mergers in the digital market give rise to.

Characteristics of digital platforms

Digital platforms have some characteristics that distinguish them from most other industries. Firstly, digital platforms display **network effects,** which become important as more and more people connect with each other on these platforms.[66] In other words, as the size of the platform and the number of market participants grow, the value to the different stakeholders from the platform increases. When a platform becomes more attractive for users if the total number of users on the same side of that platform grows, like in case of social networking platforms such as Facebook, the underlying network effect is direct. On the other hand, when a platform becomes more attractive for one side of the platform (say users) if the number of service providers on the other side of the platform grows, the effect is indirect. For instance, if the number of content providers on Facebook increases, it becomes more attractive to the users. [67]

Secondly, digital platforms display **economies of scale** which implies that the cost for each additional user of a platform, borne by the platform owner diminishes. For instance, the costs of an additional user for Facebook (marginal costs) are almost negligible.

Third, digital markets are **dynamic** in nature in the sense that rapid technological innovation changes the characteristics of the market often. This characteristic also paves way for digital platforms to use other existing platforms in order to venture into new markets within the digital economy. For instance, PayTM initially started as a money transfer application, but ventured into e-commerce within a period of 2-3 years.[68]

Fourth, with growing size of digital platforms, the generation and analysis of **data** becomes important. This data which is often collected for free from the users of the platforms, can be analysed to generate insights on the behaviour of the platform users and thereby, create new forms of value through products or services for users as well as platform operators.[69] Together

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[66] Accenture, G20 Young Entrepreneurs Alliance, "Five Ways to Win with Digital Platforms", 2016, https://www.accenture.com/us-en/_acnmedia/pdf-29/accenture-five-ways-to-win-with-digital-platforms-full-report.pdf

[67] Nico van Eijk et al, "Digital platforms: An Analytical Framework for Identifying and Evaluating Policy Options", Netherlands Organisation for Applied Scientific Research TNO, 9 November 2015, https://www.ivir.nl/publicaties/download/1703.pdf

[68] Mohindroo Aryan and Mohindroo Rajat, "Digital Economy & Competition Law: A Conundrum", Indian Competition Law Review, May 2018, Vol III, http://www.iclr.in/assets/pdf/2.pdf

[69] Accenture, G20 Young Entrepreneurs Alliance, "Five Ways to Win with Digital Platforms", 2016, https://www.accenture.com/us-en/_acnmedia/pdf-29/accenture-five-ways-to-win-with-digital-platforms-full-report.pdf

with network effects and economies of scale, the amount of data generated is one of the main characteristics that differentiate digital platforms from most other business models.[70]

Lastly, digital markets offer significant opportunities for large and small companies to benefit from **integrating businesses** which allows these companies the access to new markets and distribution channels, without funding the full costs of a platform business up front.

Given features such as network effects, economies of scale and opportunities of data sharing, mining and analysis for scaling services, many platform operators strategize to increase their size and user base by mergers and acquisitions (M&As). Google, Facebook and Amazon have acquired various younger companies in recent years. For instance, Facebook acquired Instagram in 2012, when the latter was only 2 years old providing its users a free mobile photo application, while Facebook was a digital social networking platform with photo sharing as one of its features. Google acquired Flutter, an early stage start-up for gesture recognition for advancing its artificial intelligence cluster.

For platform operators, such M&As increase revenues, both through direct payments as well as through advertising revenues, and also give them access to large volumes of customer data to develop new products and services, thereby increasing their user base further.[71] For consumers, the synergies resulting from such transactions lead to improvement in the product quality, increased choice and convenience. For instance, after its acquisition by Facebook in 2012, Instagram introduced fully-fledged social network functionalities, such as direct messaging, photo tagging, and allowed advertisers to place their advertisements on the platform.

However, it is also possible that the transacting parties use these very features of the digital markets, especially the access to free consumer data, design and algorithms, to their advantage, which in turn might impact competition and / or consumers adversely. The providers of this free data, namely the platform users are disaggregated and have limited collective bargaining power against platform owners, who can use the freely acquired data for targeted advertising to improve and eventually monetize their services. For consumers however, this might lead to a compromise of privacy by making available their personal data to the merged parties for free.

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[70] Nico van Eijk et al, "Digital platforms: An Analytical Framework for Identifying and Evaluating Policy Options", Netherlands Organisation for Applied Scientific Research TNO, 9 November 2015, https://www.ivir.nl/publicaties/download/1703.pdf

[71] Nico van Eijk et al, "Digital platforms: An Analytical Framework for Identifying and Evaluating Policy Options", Netherlands Organisation for Applied Scientific Research TNO, 9 November 2015, https://www.ivir.nl/publicaties/download/1703.pdf

Furthermore, the combination of datasets (user information) of the merging parties could also increase the merged entity's market power in the use of the relevant data to raise barriers to entry for competitors, as the merged entity would now have access to richer information of their users. By reducing potential competition, the merged entity might also have lower incentive to innovate going forward.

Hence, while there are efficiencies from M&As in digital markets, expectations or concerns about adverse effects on competition and consumer welfare resulting from these transactions, are legitimate. Key consideration in such transactions is to determine how, as providers of free data to digital platform owners, consumers can be compensated and hence given greater bargaining power against the latter.

In the next section, we discuss these concerns in the context of challenges that the nature of the market imposes on competition assessment in the sector, using some of the recent transactions to substantiate how advanced jurisdictions around the world have addressed these challenges. Our review suggests that although the advanced jurisdictions are using a flexible approach to address some of these concerns, no clear solution has emerged.

Competition assessment of mergers in digital markets

The competition assessment of a merger or an acquisition, which crosses the thresholds mandating antitrust review, comprises three basic steps (a) defining the relevant product and geographic markets within which competition impact is to be assessed; (b) assessing market power in the defined relevant market; and (c) analyzing the effect of the transaction on competition in the relevant market. In the case of mergers in the digital market however, the complex characteristics of the digital market discussed earlier, and the potential positive and negative impact of mergers in this space, make some of the tried and tested antitrust theories and procedures unsuitable for competition assessment.

The dilemma of competition authorities in assessing such mergers is therefore multi-fold. One, how do they anticipate the synergistic effect of such mergers, which may seem inconsequential and might even fly under their radar because it is common for digital platform operators to provide services for "free". (Even though the platform owners get access to free consumer data in return, which allows them to gain scale before being able to monetize their services.) Second, how to define the relevant markets and assess the impact on consumers and competition because of the dynamic nature of the sector. Third, what corrective action to take without being

able to predict the effect such actions could have on dampening innovation. Fourth, how to deal with the problem of consumers not being compensated for data that is eventually monetized by these companies.

We discuss these challenges in light of some of the recent transactions in the digital space, namely Facebook's acquisition of WhatsApp, Google's acquisition of DoubleClick, Microsoft's acquisition of Skype, and Apple's acquisition of Shazam.

Identifying digital mergers requiring antitrust scrutiny:

Typically, revenue or turnover thresholds are used to assess whether a merger is notifiable. However, with the advent of digitization, the adequacy of turnover-based thresholds to identify certain mergers is becoming questionable as often digital platforms offer services for "free" to begin with and later start monetizing their products or services. This impacts the revenue streams of digital companies and thus allows some of the high valued digital mergers to escape competition assessment. For instance, the turnover of WhatsApp when Facebook acquired it in 2013, was lower than the threshold requiring competition assessment in the European Union (EU). This meant that based on turnover thresholds, the transaction did not need a review in the EU. The European Commission (EC) however, opined that the transaction amounted to concentration and was capable for review under the competition laws of three of its member states, thereby mandating a detailed competition assessment of the transaction.[72]

More recently, when Apple acquired Shazam, a developer and distributor of music recognition mobile applications for smartphones, tablets and personal computers (PCs), in 2018, the parties did not satisfy the EC's turnover thresholds. However, the EC assessed the merger for potential anticompetitive conduct based on referrals from member states.[73]

These transactions suggest that the EC is adopting a flexible approach in bypassing the traditional thresholds for identifying digital mergers which might require further scrutiny from an antitrust standpoint. The issue with this approach, however, is that it is discretionary rather than rule based. In other words, this approach gives the regulator, the power to investigate any merger which in its opinion warrants investigation. Secondly, it raises the issue of false

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[72] European Commission, "Case No COMP/7217 – Facebook /WhatsApp", Regulation (EC) 139/2004 Date: 06/09/2018, merger procedure, 3rd October 2014, https://ec.europa.eu/competition/mergers/cases/decisions/m7217_20141003_20310_3962132_EN.pdf
[73] European Commission, "Case No COMP/8788 – Apple /Shazam", Regulation (EC) 139/2004 Date: 06/09/2018, merger procedure, 6th September 2018, https://ec.europa.eu/competition/mergers/cases/decisions/m8788_1279_3.pdf

positives, as the regulator might find market concentration where none exists in the future. This can in turn have a negative impact on innovation.

Defining the relevant product and geographic markets

From an economic perspective, the definition of relevant markets is largely driven by the principle of demand and supply substitutability.[74] Demand (supply) substitutability implies that consumers (producers) can and do switch to another product, or purchase (sell) the product or service from another geographic area when the price of a product increases in one market.

Most of the tools used to define the relevant market are based on this principle and consider price as the main reason consumers or producers switch between products or geographies. The commonly used "Small but Significant and Non-Transitory Increase in Price (SSNIP)" test for instance, focuses on defining the relevant market on the smallest set of products/services, such that a hypothetical monopolist would not find it profitable to increase prices by 5 to 10 percent as the consumers can substitute between the products / services within that set. However, in case of digital markets, the price-based tools become redundant as platform owners often provide products or services for free in exchange for data. In such markets, non-price factors such as quality or privacy, are more important to consumers.

Another consideration in defining markets in case of multi-sided platforms, such as Facebook, where the stakeholders using the platform includes consumers, advertisers, and content providers is that substitutability must be reviewed with respect to each stakeholder group, each operating system and underlying functionality. For instance, in the merger between Facebook and WhatsApp, the EC defined the relevant markets at three levels – consumer communication services, social networking services and online advertising services. For consumer communication services, the EC further assessed the possibility of delineating the market based on the platform used (smartphone, PC or tablets), operating system (Windows, Mac, Android or iOS) and functionalities (text messaging, SMS, MMS, e-mails etc.). Based on market investigations and factors such as (a) consumers' and producers' perception about consumer communications applications on different operating systems, (b) the overlap of consumer communications applications with the parties' functionalities and (c) the pricing conditions across functionalities, the EC opined that the market delineation based on functionalities and

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[74] European Commission Notice on the Definition of Relevant Market for the Purposes of Community Competition Law, Official Journal the European Communities, C 372/5, 9.12.97, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31997Y1209(01):EN:HTML.

operating system was inappropriate. The EC ultimately defined the relevant product market as the market for consumer communications applications for smartphones. For social networking applications and online advertising, the EC left the market definitions open.

While the EC has so far relied on substitutability across these parameters to define the relevant markets, according to recent literature on digital markets, the SSNIP can be modified to take into consideration non-price factors such as quality, i.e., defining the relevant market by measuring the effects of change in quality of service (known as Small but Significant Non-Transitory Change in Quality Test (SSNIQ)).[75] Even though change in quality is more difficult to measure and quantify compared to price, consumers' conduct might provide an indicative measure about their preferences when quality changes. It is also possible to consider change in costs to consumers in terms of the attention that the consumers pay while buying the free product or the information to be provided to use the product/service, as a parameter to undertake the SSNIP test.[76]

Assessing market power and the impact of the transaction on competition in the relevant market

Structural indicators of market power, such as market shares can be misleading in case of assessing impact of competition from digital mergers because of the dynamic nature of these markets, which makes it possible for market participants to displace market leaders relatively quickly.[77] Secondly, often the products / services offered by digital platforms are provided free of cost which makes the estimation of market shares based on revenues, an incorrect indicator of the merging parties' market power.

This implies that market power assessment in case of digital mergers should focus on the exclusionary power resulting from the merger, which is not necessarily associated with higher market share or profits and requires examination of other factors. For instance, in the acquisition of Skype by Microsoft in 2011, the EC opined that market shares gave limited indication of competitive strength because of the dynamic nature of the market and that

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[75] Jens-Uwe Franck and Martin Peitz, Market Definition and Market Power in the Platform Economy, Centre on Regulation in Europe (CERRE), May 2019, P 63/93, https://www.cerre.eu/sites/cerre/files/2019_cerre_market_definition_market_power_platform_economy.pdf

[76] Michal S. Gal & Daniel L. Rubinfeld, "The Hidden Costs of Free Goods: Implications for Antitrust Enforcement", 80 Antitrust L.J. 521, 2016, https://www.law.berkeley.edu/wp-content/uploads/2015/04/Gal-Rubinfeld-The-Hidden-Costs-of-Free-Goods-2015.pdf

[77] Maher Maria and et al, "Resetting Competition Policy Frameworks for the Digital Ecosystem", GSMA, October 2016. https://www.gsma.com/publicpolicy/wp-content/uploads/2016/10/GSMA_Resetting-Competition_Report_Oct-2016_60pp_PRINTv2.pdf

volume-based market shares were better than value-based market shares. The EC's assessment of the two relevant product markets - the consumer communications services and the enterprise communications services, was based on the following: [78]

1. In case of the market for consumer communications services, the EC acknowledged the nascent and growing nature of the market, especially with respect to voice and video calling functionalities, and observed a gradual shift away from PCs to other platforms such as smart phones and tablets.

2. The EC also acknowledged the price sensitivity of the consumers with respect to consumer communications services and that consumers would cease to use Skype's communication services if they were charged.

3. The EC gave due regard to innovation and quality of service provided in its assessment of competition in the market.

4. In view of the possible anticompetitive effects of the transaction in case of consumer communication services, for instance through the commercial bundling of Skype with Windows, tying of Skype with these operating systems or attempts by Microsoft to differentiate Skype's user experience based on platforms, the EC opined that Microsoft has no incentives to engage in such foreclosure of competition as it is likely to harm its own business in the future.

5. In case of the market for enterprise communication services, the EC recognized that Skype is not a competitor of Microsoft and other competitors such as Cisco, Siemens, IBM, Aastra and Avaya are Microsoft's closest competitors.

Another important consideration for competition assessment of digital mergers is the possibility that greater access to and control of data might translate into market power if it reduces the competitive constraint from other firms. In other words, access to important data insights related to customer behaviour may allow companies to use data to squeeze out competitors. Access to unique data insights may also be construed as barriers to entry for potential new rivals.[79] For instance, an important issue assessed by the EC in its review of Apple's acquisition of Shazam was to determine the ability of the merged entity to undertake any anticompetitive conduct based on the concentration of data. In particular, the EC assessed

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[78] European Commission, "Case No COMP/M.6281 - Microsoft/ Skype", Regulation (EC) No 139/2004, Merger Procedure, October 7, 2011, https://ec.europa.eu/competition/mergers/cases/decisions/m6281_924_2.pdf

[79] Maher Maria and et al, "Resetting Competition Policy Frameworks for the Digital Ecosystem", GSMA, October 2016, https://www.gsma.com/publicpolicy/wp-content/uploads/2016/10/GSMA_Resetting-Competition_Report_Oct-2016_60pp_PRINTv2.pdf

whether Apple could improve the performance of Apple Music's customer acquisition channel using the data acquired through Shazam, by engaging in targeted advertising for customers of rival providers of music streaming services such as Spotify. The EC's assessment found that there existed various factors which ensured that the parties could not use the combined datasets to engage in any anticompetitive conduct. First, the EC found that there would be some legal limits for Apple to use the information about the customers of its competitors. Second, it was possible for the parties' competitors to gather information similar to that collected by Shazam, which gave Apple limited incentive to engage in any anticompetitive conduct using Shazam's data. Therefore, the Commission concluded that it was unlikely that the data increment brought by Shazam would provide Apple with competitive advantage to cause any anticompetitive effects by reducing the ability and incentives of other digital music streaming providers to compete.[80]

The table below summarizes the four transactions and their competition assessment as done by the EC. All these transactions were cleared by both the FTC and the EC, however the FTC's considerations for clearing the transactions were not public.

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[80] European Commission, "Notice on Competition Merger Brief", July 1, 2019, https://ec.europa.eu/competition/publications/cmb/2019/kdal19001enn.pdf

Table 1: Summary of EC's assessment of the transactions in digital markets

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
Google/ DoubleClick[81]	In 2007, Google acquired DoubleClick, a company selling ad serving, management and reporting technology to website publishers and advertisers, for a deal	• Approved by EC • Approved by FTC[82]	• Parties did not meet the EU merger thresholds • EC undertook the assessment because the transaction was capable for review under the competition laws of at	• EC defined the product markets at 3 levels (1) market for online advertising space (2) market for intermediation in online advertising, and (3) market for online display ad serving technology • For the market for online advertising, the EC used market investigation and	• Market power: The EC opined that high market shares did not indicate high market power. • Factors considered for competition assessment: (1) Lack of horizontal competition between the parties (2) Although switching costs for DoubleClick's customers were found to be not insignificant, it did not prevent consumers	EC cleared the transaction without any remedies

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[81] European Commission, "Case No COMP/M.4731 –Google/ DoubleClick", Regulation (EC) No 139/2004, Merger Procedure, March 11, 2008, https://ec.europa.eu/competition/mergers/cases/decisions/m4731_20080311_20682_en.pdf

[82] Federal Trade Commission, December 20,2007. https://www.ftc.gov/news-events/press-releases/2007/12/federal-trade-commission-closes-googledoubleclick-investigation

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
	valued at USD 3.1 billion		least 3 Member States	substitutability of search and non-search ads by publishers and advertisers, to assess further delineation but ultimately left the market definition open. • EC kept the question of further delineation of the market for intermediation in online advertising open • EC delineated the market for display of ad serving technology based on provision of these services to	from actually switching between providers (3) Presence of sufficient number of strong competitors (4) Data concentration concerns, which were eliminated based on two reasons: a. Contractual obligations of DoubleClick with its customers which prohibited it from using the customers' data for improving ad serving to	

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
				advertisers and publishers • Relevant geographic market was defined as divided along the national or linguistic borders within the EEA.	advertisers and publishers b. Some of Google's competitors already possessed similar combination of datasets.	
Microsoft/ Skype	In 2011, Microsoft acquired Skype in a 100 percent share transfer deal valued at USD 8.5 billion.[83]	• Approved by EC • Approved by FTC	• Parties met the EU turnover thresholds	• EC defined the product markets at 2 levels (1) market for consumer communications services and (2) market for enterprise	• Market power: According to the EC, market shares gave limited indication of competitive strength because of the dynamic nature of the market. • Factors considered for competition assessment:	EC cleared the transaction without any remedies

[83] Guardian. Microsoft confirms $8.5bn Skype deal (10 May 2011) https://www.theguardian.com/technology/2011/may/10/microsoft-confirms-skype-deal

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
				communications services • For both the markets, the EC left the question of further delineation based on platforms, operating systems and functionalities open • Relevant geographic market was defined as at least EEA	(1) Nascent and growing nature of the market for consumer communications services (2) Price sensitivity of the consumers with respect to consumer communications services as Skype currently offers these services free of charge (3) Innovation and quality of service provided (4) Low level of barriers to entry and exit (5) Limited incentive for Microsoft to cause	

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
					foreclosure of competition (6) Limited competition between Skype and Microsoft in the market for enterprise communication services	
Facebook/ WhatsApp	In 2014, Facebook acquired WhatsApp for USD 19 billion	• Approved by EC. • Approved by FTC with a notice to the parties to protect consumer privacy[84]	• WhatsApp's turnover did not meet the EU merger thresholds • EC undertook the assessment because the	• EC defined the product markets at 3 levels – (1) market for consumer communication services, (2) market for social networking services, and	• Market power: The EC opined that high market shares did not imply high market power due to the dynamic nature of the market. • Factors considered for competition assessment: (1) Lack of close competition between the	EC cleared the transaction without any remedies

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[84] S Bitton Daniel, "United States – E-commerce and Big Data: Merger Control", GCR, December 7, 2018, https://globalcompetitionreview.com/insight/e-commerce-competition-enforcement-guide/1177730/united-states-%E2%80%93-e-commerce-and-big-data-merger-control#footnote-042.

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
			transaction amounted to concentration and was eligible for review under the competition laws of 3 Member States	(3) market for online advertising services. • Market for consumer communication services was further assessed for substitutability across platforms, operating systems and functionalities. It was narrowed down based on platforms and ultimately defined as the market for consumer communication	parties, especially Facebook Messenger and WhatsApp (2) No barriers to entry or switching costs involved for consumers (3) Dynamic nature of the market which mitigate anticompetitive conduct from the network effects (4) Potential data concentration concerns were eliminated, especially in the market for online advertising, based on two reasons: a. Competition from potential and actual	

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
				services for smartphones. • Market definition for social networking services and online advertising was left open. • Relevant geographic market was defined as at least European Economic Area (EEA)	competitors for targeted online advertising, b. Presence of significant number of alternative service providers	
Apple/ Shazam	In 2018, Apple acquired Shazam, a developer and distributor of	• Approved by EC • Approved by FTC without any enquiry.	• Parties did not meet the EU merger thresholds. • The EC undertook the	• EC defined the relevant product markets as (1) market for software solutions platforms (2) market for digital market distribution services	• Market power: the EC used market shares as proxy for market power • Data concentration concerns were eliminated based on the following factors,	EC cleared the transaction without any remedies

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
	music recognition mobile applications for smartphones, tablets and PCs, for USD 400 million.[85]		assessment based on referrals by Member States.	(3) market for automatic content recognition (ACR) software solutions, including music recognition apps (4) market for licensing of music data, and (5) market for online advertising. • Exact market definition for software solutions, licensing of music data and online advertising was left open. • For ACR solutions, the EC considered the narrow	(1) Legal and contractual limits for Apple to use the information about the customers of its competitors (2) Documental evidence which showed that Apple did not have a clear incentive to undertake the possible anticompetitive conduct using the combined data. (3) Competitors of the parties could gather information similar to that collected by Shazam.	

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[85] Financial Times. Apple's plan for Shazam (13 December 2017). https://www.ft.com/content/4f8a03be-e00e-11e7-a8a4-0a1e63a52f9c

Case	About the transaction	Regulatory approvals	Whether the threshold was met	Relevant market definition	Assessing market power and the impact of the transaction on competition	Any remedies suggested
				market for dedicated stand-alone music recognition apps for smart mobile devices and the broader markets for ACR software solutions based on platforms such as PCs, smart mobile devices, smart wearables (including smart watches) and smart TVs. The question of further delineation of the market based on other platforms was left open. • The geographic market was defined as EEA.		

The discussion above indicates that in Europe, antitrust enforcement is becoming receptive to adopting a forward-looking approach to assess competition in digital mergers. This is evident from the tools such as market investigations, heed to complaints regarding concentration of consumer data, or reliance on factors other than market shares to indicate market power, that the EC has used in its review of these mergers. Though the FTC judgement on many of these transactions is not available for public review, evidence such as the FTC's notice to Facebook and WhatsApp to ensure consumer privacy, indicates that the FTC has also shown willingness to raise consumer protection concerns in the merger context, when needed.[86]

While this shows the intent of the regulators to address competition issues in this dynamic market by adopting a dynamic approach, it also reflects an approach to competition assessment that is not rule based and hence susceptible to being challenged.

Lessons for competition assessment of digital mergers in India

In India, as more and more consumers go digital on global platforms, larger transactions in the digital space are likely. While some of the transactions we discussed in the earlier section were consummated prior to the enforcement of the Combinations Regulation under the Competition Act, 2002, some others evaded competition assessment in the country because they failed to satisfy the Competition Commission of India's (CCI) turnover thresholds which call for merger review. Specifically, since the acquisitions in digital markets often derive value from data acquired from consumers for free by the parties, and the product or service offered is also generally free of charge, the target may not always have a significant asset base which allows the transaction to skip the threshold requirement as not raising any concerns to competition.

Moreover, while in the EU, the Commission has recourse to other mechanisms to review mergers which do not meet the threshold requirements, the CCI does not have the regulatory authority to assess non-notifiable transactions. Even when transactions in the digital market have been notified, like the merger between Flipkart and eBay[87] or Walmart and Flipkart,[88] the CCI has applied standard measures of assessing market power and competition such as market shares, barriers to entry, extent of vertical integration, extent of competition likely to remain

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[86] S Bitton Daniel, "United States – E-commerce and Big Data: Merger Control", GCR, December 7, 2018, https://globalcompetitionreview.com/insight/e-commerce-competition-enforcement-guide/1177730/united-states-%E2%80%93-e-commerce-and-big-data-merger-control#footnote-042.

[87] eBay and Flipkart, Competition Commission of India Order on Combination Registration No.C-2017/05/505, *eBay Singapore Services Private Limited /Flipkart Limited*, 2017, https://www.cci.gov.in/sites/default/files/Notice_order_document/C-2017-05-505O.pdf

[88] Flipkart and Wal-Mart, Competition Commission of India Order on Combination Registration No. C-2018/05/571, *Flipkart Limited/Wal-Mart International Holdings Inc*." 2018, https://www.cci.gov.in/sites/default/files/Notice_order_document/Walmart%20PDF.pdf

after the combination etc. The CCI has however not assessed the transactions with respect to the dynamic nature of the digital markets or the potential anticompetitive conduct arising from combinations of data held by the parties, plausibly since most of these transactions involve only a small element of digitization through the e-commerce platforms of the parties.

With digital advancement, it is likely that the transactions in the digital space will get more complex. This requires that the CCI follows a framework to be able to effectively assess mergers in the digital market. Factors to examine are whether mergers can lead to dominance by merged entities and as a result increase the likelihood of anticompetitive abuse of such dominance, or whether they promote efficiency, innovation, competition and consumer protection, and finally how the CCI can identify the possibility of such market power and its abuse or efficiency generation, ex-ante. Taking lessons from the judgements on some of the global transactions in this space, we list the following recommendations for the CCI to assess digital mergers:

1. **Revisiting the adequacy of turnover based thresholds:** Since turnover-based thresholds sometimes are unable to capture mergers in the digital space, it is critical to revise the definitions of thresholds to suit the characteristics of digital markets. To address these concerns,[89] especially after the acquisition of WhatsApp by Facebook fell short of the notification thresholds, Germany amended its competition laws in 2017 to include size of transaction based thresholds in order to subject start-up acquisitions to greater scrutiny.[90] Transaction value-based thresholds thus might provide a reasonable alternate to estimating the potential impact of a transaction when the turnover of the target is not significant enough to raise competition concerns.

2. **Adjusting market definition to account for specific features of digital markets:** Since the existing tools to define relevant markets may have shortcomings if applied in case of digital mergers, it is critical that while evaluating mergers in this space, existing tools such as SSNIP are modified – for instance to account for the forward looking and dynamic nature of the market. It is also critical to assess whether the platform's activities as a whole can be characterized as a stand-alone market or further delineation based on functionalities, platforms, operating systems etc. is possible.

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[89] Organisation for Economic Co-operation and Development, "Quality considerations in digital zero-price markets, Background note by the Secretariat", November 28, 2018. https://one.oecd.org/document/DAF/COMP(2018)14/en/pdf

[90] Martin Sauermann, "The Transaction Value Threshold in Germany – Experiences with the New Size of Transaction Test in Merger Control", Competition Policy International, October 8, 2019, https://www.competitionpolicyinternational.com/the-transaction-value-threshold-in-germany-experiences-with-the-new-size-of-transaction-test-in-merger-control/

3. **Focusing on the alleged anticompetitive conduct and its likely effects:** Some of the factors which must be assessed for assessing the impact of competition include:

   a. The presence of competition which mitigates the role of network effects in conferring market power to the parties

   b. The concentration of data with the parties post the transaction and whether there exist mitigating factors to ensure the parties do not create barriers to entry, foreclose competition or harm consumers in anyway.

   c. The role of innovation in bringing efficiencies which benefit both the consumers and service providers using the merging platforms.

The discussion in this paper shows that the digital economy world over as well as in India, is creating channels for different users to connect with each other, thereby making life easier, more productive and enjoyable for people. In such a scenario, there is a need for the government to adopt a flexible yet balanced competition framework that reflects the market changes and provides a sound foundation for competition, innovation and consumer protection.

INSIGHTS INTO PLATFORM MARKETS AND ABUSE OF DOMINANCE : INNOVATION VERSUS COMPETITION IN INDIA

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Abstract

Platform based markets or two sided platforms refer to a market situation where two distinct groups interact with each other by means of a common platform. Digitalisation and globalisation waves have increased the induction of platforms in our country and the growth of such platforms has made names like Flipkart, eBay, Snapdeal, Amazon, OLA, Uber, etc. familiar in every household. Along with their development, implications for analysing anti-trust and regulatory policies on anti-competitive strategies have simultaneously cropped up. Concentration of power, abuse of dominant position in relevant geographical market and predatory pricing has been common allegations on these platform markets, India is not an exception. Competition Commission of India as the sectoral regulator receives and decides on cases related to platform markets and their anti-competitive practices. Dynamics of platform markets are high and the regulator keeps pace. In this paper, case analysis and the decisions of the Competition Commission of India will be discussed in the light of the theoretical Industrial Organisation (IO) model involving buyers, sellers and a dominant platform. The model has been developed to analyse the approach of the regulator and highlight the cross-roads of competition given the global pedagogy of growth and the multiplication of two-sided markets in generating a large share of contribution to any economy's growth.

Key Words: Antitrust, Market Power, Monopoly, Platform Competition, Two-sided Markets

I. INTRODUCTION

Platform based markets or platform markets are multi-sided markets in simpler language. One of the widely accepted definitions of multi-sided platforms are – a market in which a firm acts as a platform and sell different products to different groups of consumers, while recognising

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that the demand from one group of customer depends on the demand from the other group(s)[93]. Multi-sided markets are typically referred as "*two-sided markets*".

The wave of digital economy has led to the growth of such platforms and they operate in the relevant market or markets and the multi-dimensional effects begins on two sides- consumers and sellers meet on a platform and in many of these markets the interaction is in between consumers, content suppliers and advertisers or more. Some of the common multi-sided platforms are TV and newspapers that connect viewers and advertisers; stock exchanges that connect buyers and sellers; digital online platforms that connect users, content providers and advertisers.

Economics of platform competition has implications for analysing anti-trust and regulatory policies and it affects businesses that compete in multi-sided markets. Businesses may devise anti-competitive strategies in multi-sided platform markets just as in single-sided markets. Pricing and investment in the multi-sided markets are governed by unique economic principles and market definition and market power analysis typically focus on the effect of a price change on demand. Firms competing in the multi-sided markets are differently affected by a price change than a structural and traditional market. The process is complex and less transparent leading to the necessity of lifting the veil.

Such multi-sided platform businesses often engage in anti-competitive practices and anti-trust policies. Predatory Pricing is a strategy which is simple yet effective to eliminate all forms of competition. It is used by firms to temporarily change the price of products below its costs to gain customers and force competitors either to reduce their prices or incur losses. Application based online platforms are one of the examples wherein predatory pricing is prominent. Efficient pricing may result in setting price on a particular market side below measures of average variable or marginal cost incurred for customers on that market side. At this point, the research question is concerned with the implications whether platform intermediation can have an impact on the application of competition laws and then the relevant but various modes of regulation.The other considerations of such market power are the firm's share in the relevant market, direct and indirect network effect, switching costs to the alternative firms, entry

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[93] As available at https://www.oecd.org/daf/competition/Rethinking-antitrust-tools-for-multi-sided-platforms-2018.pdf. Last accessed on 07.08.2019.

barriers for the new firms into the market, predatory pricing, and presence of single-homing or multi-homing networks[94]. Here, our focus is primarily on predatory forms of pricing. A price increase or quality decrease to one group of participants reduces the demand not only by the group but also by the other groups who then have fewer participants to interact with — an example of cross-sided externalities. Very often regulators and antitrust authorities make a mistake in the process of drafting policies by applying the traditional 'one-sided' logic in place of this 'two-sided' logic as discussed. To illustrate this, let us take an example of a platform with two sides. In this regard, is it the case that distribution of newspaper free of charge implies that advertisers are charged heavily? The answer is yes. While advertisers are charged, the readers get the newspaper at a very nominal charge — a classic case of cross-subsidization given cross-sided externalities. A small change in the newspaper price could discourage most of the potential readers leading to a severe relapse in the advertisers' position. It entirely depends on what services are being provided to the two sides of the platform and getting both the sides on board strategically.

Platform compatibility, nature of the product and users ability to multi-home increases the chance of predation and the test more complicated. Government of India introduced new rules w.e.f 1st February, 2019[95] to prohibit e-commerce platforms from selling products from companies in which they have an equity interest; platforms are required to provide services, including fulfilment, logistics, warehousing, advertisement and marketing, payments and financing to sellers on the platform at arm's length in a fair and non-discriminatory manner and platforms are not permitted to mandate ant seller to sell any product exclusively in their marketplaces. Traditionally it is considered that an incumbent form gains the most from the practice of predatory pricing.

Though the Competition Law in India lacks a proper difference between the typical market structure and the platform market structure, the standard criteria to detect concentration of market power is not a successful tool for the platform markets and the uncompetitive practices go undetected leading to harm to both the consumers and the producers. The European

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[94] Single-homing is when the customers on one or both sides of the platform use only a single platform and Multi-homing is when customers use multiple networks simultaneously.

[95] David S. Evans, *The Antitrust Economics of Multi-Sided Platform Markets*, Yale Journal of Regulation, Volume 20, Issue 2, Article 4 (2003).

Commission For Competition (2015) defined online platforms as an undertaking operating in two (or multi)-sided markets, which uses the Internet to enable interactions between two or more distinct but inter-dependent groups of users so as to generate value for at least one of the groups. To avoid unnecessary complications for the application of anti-trust provisions when it comes to dealing with platform markets, the Commission increased its scope and ambit by drafting set of new rules to deal with such practices in the year 2018. The new rules are expected to prevent anti-competitive and abusive practices as well as predatory pricing by large e-commerce platforms to the detriment of local small and medium sized online traders. Such strategies are applied to leverage out market power and oust competition. Predation can occur in platform markets or two-sided markets where a platform prices its total service at a level that fails to cover its avoidable costs of providing the total service, taking revenues from both sides of the market into and or by asymmetric pricing between the two sides of the market.

Anti-trust issues are not only common in India but also across the world. Both sides of the Atlantic on various occasions scrutinized multi-sided platform businesses in significant anti-trust matters in the cases of AOL-Time Warner Merger[96]; Microsoft cases and others. However, The European Commission in 2017 while discussing the Google case categorically emphasised that —*"dominant companies have a special responsibility not to abuse their powerful market position by restricting competition, either in the market where they are dominant or in separate markets."* In the Amazon case[97] discussed by the US and European Competition Authorities, Amazon's strategy to under the prices of merchants on its market place was established as a form of predatory pricing and well established form of abuse. Our focus, primarily would be on this branch of predatory pricing in the context of anti-trust issues and the abuse of dominant position in the market.

This prompts us to ask the question that is it really a breach of antitrust regulation when platforms give something for free on one of its sides and does not cross-subsidize it from the other side? Can we call it predatory pricing or such actions are critical for the existence of a two-sided market? The rest of the paper is organized as follows. Section II presents a brief

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[96]US and European Competition Authorities investigated two-sided markets including internet portals, magazines and free television.

[97] As available at http://competitionlawblog.kluwercompetitionlaw.com/2018/11/30/the-eus-competition-investigation-into-amazon-marketplace/Last accessed on 08.08.2019.

review of the not so developed anti-trust literature in the context of platforms. Section III characterizes the platform markets followed by the development of the theoretical Industrial Organisation (IO) model having — buyers, sellers and a dominant platform to make a comparative assessment of the market power position between the two forms of market, *viz.* the conventional one-sided markets and the two-sided markets. We show that the usual definition of market power is very much applicable in a two-sided market structure. Also, the amount of market power that a platform monopoly can generate is very different than in case of traditional markets. In Section IV, based on the theoretical model developed, we motivate the case studies and try to look at the judgements that CCI has passed in favour of Flipkart or OLA on grounds of innovation. Finally, the paper concludes.

II. BRIEF REVIEW OF SELECT LITERATURE

There is a growing interest in how competition authorities/regulatorsare addressing multi-sided platforms because, in some cases, it is possible to find optimal prices below marginal costs, socially optimal monopolies, competitive tying/bundling, etc, see Filistrucchi et al. (2012a). In this section, we do not try to make an exhaustive analysis of the development of the anti-trust policies regarding multi-sided platforms. The idea is to present another field that is attracting the attention of researchers and present some ideas relevant to our research.

Evans (2002) points out that it is essential to consider network effects in the anti-trust analysis because they create externalities that make the one-sided analysis no longer suitable. Filistrucchi et al. (2012a), Goos et al. (2011) and others argue that the traditional anti-trust analysis cannot be applied without taking into account frictions and network externalities when there is evidence of their presence. Otherwise, the market power measures will be biased. Filistrucchi (2008) proposes that a monopolist platform can play around with both the price structure and the prices on both the sides *per se* but it is not *a priori* clear whether the hypothetical monopolist should be thought of as raising:

- The price level while optimally adjusting the price structure ;
- Both prices together keeping fixed the price structure ;
- Each of the two prices separately allowing the other price to be adjusted optimally ;
- Each of the two prices while keeping the other price fixed ;

Evans and Noel (2008) test for the biasness in the value of the market power empirically. They propose that bigger are the network effects, the larger are the biases in the market power estimates if a researcher is using a one-sided structure. Using one-sided approach to calculate the impact on the market power makes the bias even larger under merger cases. However, this last result in Evans and Noel (2008) is not found by Chandra and Collard-Wexler (2009) when analyzing the Canadian newspaper industry. Empirically, Argentesi and Filistrucchi (2007) estimate the market power in the Italian newspaper industry, and they highlight that the standard mark-up formula is no longer correct. In a similar way, Filistrucchi and Klein (2013) analyze a merger in Dutch newspaper industry and point out the same result. Song (2013) also analyzes the German magazine industry. He estimates mark-ups based on one-sided and two-sided approaches to talk about the bias in the estimates of the market power. He considers a merger simulation, and observes that the one-sided approach of calculating the market power value is biased given the fact that the network externalities are being ignored. However, under-cutting of prices and going for predatory pricing in the Indian context has hardly been analysed. Given these complexities, a new dimension opens up for theoretical modeling supported by case based evidential research.

This part of the literature will potentially grow in the coming years not only from a theoretical point of view but also from a case based analysis because many questions remain open about the applicability of how standard anti-trust approaches apply to the multi-sided platforms.

III. THEORETICAL MODEL

Consider a two-sided market. The two sides of the market are denoted by B and S where, B stands for the buyers' side and S stands for the sellers' side of it. The market is served by a monopoly platform which charges sellers a fixed membership fee M_S for getting registered on the platform[98]. Here, we assume that the online platform chooses to subsidize the sign-up of the buyers, N_B, who form the elastic side of the market, by charging fees from a finitely large seller side, N_S, who are comparatively inelastic given a considerably large buyer side exists. Both the buyer side and the seller side are assumed to have a measure of 1. Indeed, in the popular ecommerce platforms such as eBay, Amazon, Flipkart, Alibaba and more, the buyers

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[98]The benefit of registration is that the members do not have to fill their identity details every time they log on the platform. So, it saves the members' transaction cost.

are charged no fees while all fees are levied on the sellers (Basker, 2016). In line with the cross subsidization argument this assumption is very much feasible. Only the registered agents can carry out transactions on the platform. We also assume in this model that since it is prohibitively costly, no direct transaction between the buyers and the sellers is possible. The transaction happens only through the platform.

The sequence of decisions in the model is as follows. First, the monopoly platform decides about M_S, i.e. the membership fee to be charged from the sellers by the platform in period 1. Second, the sellers observe the platform's charge and then decides on the price of the commodity and provide j varieties in period 2. At the last stage, buyers decide to purchase if their reservation price is larger than the price set by the sellers. Here, we follow a Dixit and Stiglitz (1977) type product differentiation model where a representative consumer consumes little bit of every good instead of consuming her most preferred outcome. A representative buyer has two components in the utility function, i.e. the quantity consumed of the unique good and the quantities consumed of the differentiated products as the second component. Consumers differ in their type, μ which is distributed uniformly over [0,1]. Thus, the utility function of a μth type consumer, is,

$$U = q_0 + \mu \left[\left(\int_0^{N_S} q_j{}^\rho dj \right)^{\frac{1}{\rho}} \right]^\beta$$

where, q_0 is the quantity of the unique good, μ denotes the type of the consumer and q_j is the quantity of the jth differentiated good, ρ denotes the substitutability parameter or in other words the constant elasticity of substitution in a CES type utility function. We impose $0 < \rho < 1$ to ensure that monopolistic competition is functional through the N_S differentiated products and $\beta < \rho$, implies that the marginal benefit of an extra variety is declining i.e. the concavity assumption of the utility function holds good.

If P_j is the price of the differentiated product j, the representative consumer maximizes 'U' subject to her budget constraint,

$$q_0 + \int_0^{N_S} P_j\, q_j dj \leq I \quad \forall j$$

where, I is the exogenously given income of the representative consumer and q_0 becomes the numeraire good. Maximization of consumer utility with respect to q_j yields,

$$\beta\left[\left(\int_0^{N_S} q_j{}^\rho dj\right)^{\frac{1}{\rho}}\right]^{\beta-1} \mu\left(\int_0^{N_S} q_j{}^\rho\right)^{\frac{1-\rho}{\rho}} q_j{}^{2(\rho-1)} = P_j{}^2 \tag{1}$$

Since N_S is finitely large, a change in q_j has very little effect on $\int_0^{N_S} q_j{}^\rho$ and hence can be approximated by a constant k (see Dixit & Stiglitz, 1977). So, the demand function of the jth commodity is as follows,

$$q_j = k\mu^{1/2(1-\rho)} P_i^{-1/(1-\rho)}, 0 < \rho < 1; \ \forall \ j \tag{2}$$

It is clear that the demand for any j^{th} commodity is independent of the consumer type, i.e. the demand for the jth commodity $\forall j$ remains the same across the consumer types over the interval [0, 1].

Moving to the second stage, each variety of the differentiated product is produced by a different firm. Firms operate under increasing returns to scale : the marginal cost of production is c, and associated with each variety is a fixed membership fee charged by the platform, M_S. These firms operate in a monopolistic competition market structure and due to free entry make zero profits in equilibrium. We have the jth seller's profit being calculated as,

$$\pi_j = [P_j - c]q_j - M_S \tag{3}$$

where, P_j is the price charged by the jth seller. Each firm chooses price of its product to maximize its own profit. Therefore, from the first order condition of profit maximization it follows,

$$P_j = \frac{c}{\rho} \tag{4}$$

Putting P_j in equation 3 and the zero profit condition implies,

$$[P_j - c]q_j - M_S = 0 \iff q_j = \frac{\rho}{1-\rho} \cdot \left(\frac{M_S}{c}\right) \ \forall \ j \tag{5}$$

On the buyer side, plugging in the values from equation (4) and equation (5), the indirect utility function becomes,

$$v = I - \frac{N_S M_S}{1-\rho} + \mu N_S^{\frac{\beta}{\rho}} \left[\frac{\rho M_S}{c(1-\rho)}\right]^{\beta} \tag{6}$$

where, N_S is the number of sellers on the platform. Notice that a rise in the number of sellers increases the surplus enjoyed by a representative buyer on account of her love for variety. Hence, a positive externality is generated from the seller side to the buyer side. Assuming the outside option of the consumer is $\bar{v}$, a consumer purchases from the platform if and only if $v \geq \bar{v}$. Therefore, $N_B = \Pr[v \geq \bar{v}] = \Pr[\mu \geq \bar{\mu}]$ where,

$$\bar{\mu} = \frac{\bar{v} + \frac{N_S M_S}{1-\rho} - I}{N_S^{\frac{\beta}{\rho}} \left[\frac{\rho M_S}{c(1-\rho)}\right]^{\beta}}$$

Therefore,

$$N_B = 1 - \left(\frac{\bar{v} + \frac{N_S M_S}{1-\rho} - I}{N_S^{\frac{\beta}{\rho}} \left[\frac{\rho M_S}{c(1-\rho)}\right]^{\beta}}\right) \tag{7}$$

The problem can now be solved for N_S by putting the equilibrium value of q_j from equation 5 and P_j from equation 4 in equation 1. Therefore,

$$N_S = \frac{\left(\frac{c}{\rho}\right)^{\frac{2\rho}{\beta-\rho}}}{(\mu\beta)^{\frac{\rho}{\beta-\rho}}\left(\frac{\rho}{1-\rho}\cdot\frac{M_S}{c}\right)^{\frac{(\beta+\rho-2)\rho}{\beta-\rho}}} \tag{8}$$

Moving to the platform, the platform is assumed to incur a constant cost per seller, C_S. Its profits are therefore,

$$\pi = (M_S - C_S)N_S \tag{9}$$

From equation 9, the term within brackets represents the platform's collection per transaction from the seller side. Using equation 8, we can express N_S as a function of M_S. Therefore, the platform's profit can be expressed as a function of the membership charge on the seller side is,

$$\pi = (M_S - C_S)\left[\frac{\left(\frac{c}{\rho}\right)^{\frac{2\rho}{\beta-\rho}}}{(\mu\beta)^{\frac{\rho}{\beta-\rho}}\left(\frac{\rho}{1-\rho}\cdot\frac{M_S}{c}\right)^{\frac{(\beta+\rho-2)\rho}{\beta-\rho}}}\right] \tag{10}$$

by choice of$\{\widetilde{M}_S\}$. Also, it needs to be noted that a transaction is not complete unless a buyer meets a seller.

Proposition: (i) *The per unit price charged on sellers' side is given by* $\widetilde{M}_S = \frac{\rho C_S(\beta+\rho-2)}{\rho(\beta+\rho-2)-(\beta-\rho)}$

(ii) *The total number of sellers affiliating with the monopoly platform is given by*

$\widetilde{N}_S = D.K^\eta$ *where,* $D = \frac{\left(\frac{c}{\rho}\right)^{\frac{2\rho}{\beta-\rho}}}{(\mu\beta)^{\frac{\rho}{\beta-\rho}}}$ *,* $\eta = -\left[\frac{\rho(\beta+\rho-2)}{\beta-\rho}\right]$, $K = \left(\frac{\rho}{1-\rho}\cdot\frac{\left[\frac{\rho C_S(\beta+\rho-2)}{\rho(\beta+\rho-2)-(\beta-\rho)}\right]}{c}\right)$

(iii) *The total number of buyers affiliating with the monopoly platform is given by*

$$N_B = 1 - \left(\frac{(\bar{v} - I)(1-\rho) + DK^{\eta+1}\left[\frac{c}{\rho}(1-\rho)\right]}{[DK^\eta]^{\beta\left(\frac{1}{\rho}+\frac{1}{\eta}\right)}}\right)$$

(iv) *The total number of transactions on a monopoly platform is given by*

$$\widetilde{N}_B\widetilde{N}_S = \left[1 - \left(\frac{(\bar{v} - I)(1-\rho) + DK^{\eta+1}\left[\frac{c}{\rho}(1-\rho)\right]}{[DK^\eta]^{\beta\left(\frac{1}{\rho}+\frac{1}{\eta}\right)}}\right)\right][D.K^\eta]$$

(v) *Platform earns a profit of* $\left[\frac{C_S(\beta - \rho)}{[\rho(\beta + \rho - 2) - (\beta - \rho)]} \right][D.K^\eta]$

(vi) *The Lerner Index of Monopoly Power,* $\frac{\tilde{M}_S - C_S}{\tilde{M}_S} = \frac{1}{\eta}$

Proof :(i) Assuming existence of an interior solution, the first order condition for platform's maximization exercise yields,

$$\frac{\partial \pi}{\partial M_S} = 0 \implies N_S(M_S) + (M_S - C_S)\frac{\partial N_S}{\partial M_S} = 0 \tag{11}$$

that solve for,

$$\tilde{M}_S = \frac{\rho C_S(\beta + \rho - 2)}{\rho(\beta + \rho - 2) - (\beta - \rho)} \tag{12}$$

given, $0 < \beta < \frac{1 - \beta}{2} < \rho < 1$.

(ii) Putting $\tilde{M}_S$ in equation (8)

$$\tilde{N}_S = \frac{\left(\frac{c}{\rho}\right)^{\frac{2\rho}{\beta - \rho}}}{(\mu\beta)^{\frac{\rho}{\beta - \rho}}\left(\frac{\rho}{1 - \rho} \cdot \frac{\left[\frac{\rho C_S(\beta + \rho - 2)}{\rho(\beta + \rho - 2) - (\beta - \rho)}\right]}{c}\right)^{\frac{(\beta + \rho - 2)\rho}{\beta - \rho}}} = D.K^\eta$$

(iii) Similarly, putting $\tilde{M}_S$ and $\tilde{N}_S$ in equation (7), one can derive $\tilde{N}_B$.

(iv) The number of transactions on the platform is given by $\tilde{N}_B\tilde{N}_S$.

(v) The equilibrium level of profit, $\tilde{\pi}$, follows from equation (10).

(vi) $\frac{\tilde{M}_S - C_S}{\tilde{M}_S} = \frac{1}{-\eta}$ where, $\eta = -\frac{\rho(\beta + \rho - 2)}{\beta - \rho}$ and the total volume of the absolute value of elasticity exceeds 1 consistent with the monopoly platform operating in the elastic part of the demand curve. The statement of the fifth part of the proposition follows since $\beta < \rho$. $\square$

Given that the online platform chooses to subsidize the sign-up of the buyers, who form the elastic side of the market, the model solves for the equilibrium fee the platform charges on the seller side of the platform. Part (vi) of the proposition shows the Lerner mark-up formula in the context of a monopoly platform which is very different from the normal monopoly markets as given in standard textbooks. In the context of a two-sided platform, this is the point of argument that how companies having a dominant position can abuse their dominant position through cross-subsidization i.e. charging a very nominal amount from one side and making up

for it by charging the other side verysubstantially — modern form of predatory pricing. Here, our objective is to show that given the two-sided nature of the market, it is perfectly possible that the platform earns profit by cross-subsidization through the indirect network externalities (existing between the two sides) as discussed earlier.

IV. IN THE CONTEXT OF COMPETITION COMMISSION OF INDIA: CASE ANALYSIS

".... Specifying a threshold or an arithmetical figure for defining dominance may either allow real offenders to escape or result in unnecessary litigation. Hence in a dynamic changing economic environment, a static arithmetical figure to define dominance will be an aberration [.....]" — Raghavan Committee Report[99]

Concentration of power, abuse of dominance in relevant geographical market and predatory pricing has been common allegations on platform markets in India. The Commission decides the cases in almost in similar patterns overlooking the impact on competition for the sake of innovation. But it is also appropriate time to understand that platform markets and/or multi-sided platforms are unique in terms of their features. The Competition Law in India contained in the Competition Commission Act, 2002 and its relevant rules lacks to outline a proper difference between the typical market structure and the platform market structure. The troughs and ridges in the Competition Act, 2002 have proved to be inapt to deal with the requirements of platform market structures and more so to regulate anti-competitive features of platforms.

The standard criteria to detect concentration of market power is not a successful tool for the platform markets and the uncompetitive practices go undetected leading to harm to both the consumers and the producers. One of the aspects of such assessment is also the network effects. Network effects both direct and indirect are a source of market power for platforms. Higher the number of people who use a particular good, greater is the amount of utility derived by each participant. Very few non-platform markets exhibit direct network effects. In two-sided markets or platforms, there are both direct and indirect network effects. Indirect network effects

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[99] This report was referred in the Ola- ANI Technologies Ltd Case being Case No 6& 74 of 2015 decided by the Competition Commission of India and it was considered relevant to understand predatory pricing by a company in a position to abuse its dominance.

are unique to platforms which are multi-sided in nature. Indirect network effects refer to the benefit that one side of the market derives from being on the platform and depends on the number of people on the other side of the market that they can access. For indirect network effects to exist, a market necessarily has to have more than one side to it.

Market power is defined as the ability of a firm to profitably raise the price of a product or service over the marginal cost. In Platform markets many services are provided for '*free*', thus the traditional definition of market power can neither be applied nor is apt. The market power that we have derived from the model in the previous section is very different from the market power structure in a conventional monopoly market.The other relevant indications of such market power are the firm's share in the relevant market, direct and indirect network effect, switching costs to the alternative firms, entry barriers for the new firms into the market, predatory pricing, and presence of single-homing or multi-homing networks[100].

In the year 2018, CCI passed a final order with an imposition of penalty on Google for abusing its dominant position in the framework of 'Online General Web Search' and 'Web Search Advertising Services' markets in India where it was a monopoly. Google encrypted the DNS generally available in its Chrome browser. By encrypting DNS data, Google would prevent third parties, such as ad tech intermediaries or internet service providers, from tracking users while they explore the web and actually became a monopoly.A penalty of INR 135.86 crores was imposed on Google based on the turnover of its India operations. Two members of the CCI gave a dissent and concluded that there was not enough evidence to find an abuse of dominant position by Google under the provisions of the Competition Act.This case sums up that how a monopoly platform can abuse its dominant position (by charging from the advertisers and nothing from the web surfers) and earn huge profits making use of the cross-sided externality benefits in line with the model proposed in the previous section.

Some of the other cases with regards to abuse of dominance but not monopoly firms *per se*are as follows. In **Ola Case**[101] decided by the Commission, it was complained that the company

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[100] Single-homing is when the customers on one or both sides of the platform use only a single platform and Multi-homing is when customers use multiple networks simultaneously. As available at
http://www.cresse.info/uploadfiles/2018_ps6_pa4.pdf;Last accessed on 27.11.2019.

[101] Case No. 6 & 74 of 2015

was abusing its dominant position in the relevant market by offering heavy discounts to the passengers and incentives to the cab drivers associates with them which amounts to predatory pricing under Section 4 (2) (a) (ii) of the Act. This conduct affected the competitors who cannot offer similar discounts/incentives to commuters/drivers. The aggregator model of taxi services was analysed. The investigation considered the relevant geographical market; the model against hybrid or asset based model and laid down its final observations. The main allegation of abuse was below-cost pricing strategy. The commission observed that the platform based model allowed an upper hand to the company in the relevant market but it did not affect other competitors. The pricing strategy was to catch the fancy ofprospective consumers to the newly introduced model and the long-term impact of the strategy was questionable. The commission did not interfere in the predatory pricing allegations not to disturb the dynamics of the market but only decided upon the dominance in the relevant market due to the nascent market situation.

In *Flipkart India case*[102] it was alleged by the informant that in the e-commerce marketplace business the company registered as Flipkart.com was connecting buyers and sellers on its electronic marketplace platform and receives platform fee from the registered sellers. It was alleged that certain companies were sold goods at discounted prices and such discriminatory practices was leading to an adverse effect on competition. The company was using its dominance in the relevant market by leveraging its position to enter into another market by way of extending discounts and manufacturing products of particular companies (In this case WS Retail Services Private Limited). The commission observed that since the company Flipkart India was not dominant in the relevant market of "Services provided by online marketplace platforms for selling goods in India", the question of abuse does not arise and neither does the question of preferential treatment by higher discounts can be levied. It was again emphasised that since the e-commerce model is relatively nascent and evolving in India intervention for trifles should be avoided for the sake of consumer benefits and innovation.

The definition of relevant market and determination of dominant position needs to be considered reflecting new area of market developments. It cannot be ignored that the multi-sided platforms provide services to different customer groups and each demand between distinct customer groups is interdependent, thus the traditional one-sided logic may lead to

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[102] Case No. 20 of 2018

fallacy in assessing market power as shown in the theoretical model. One of the concerns across the globe has been the dominance of digital platforms like Google and Facebook. In the absence of competitors, these platforms enjoy the monopolistic features of the market[103]. Dominance in the relevant product market leads to greater competitive threats and thus these are likely to be more challenging for the regulators in the coming years.

V.CONCLUSION

Concentration has risen and the margins have reasonably gone higher. The question is whether the antitrust law in India is "*fit for the purpose*". The rise of dominant platforms paves way for an array of questions such as typical barriers to entry in terms of data; exploitative behavior[104]; potential competition[105]; exclusions or foreclosure of the players; and other anti-trust behavior. In terms of competition, it would not be out of context to state that the multi-sided platforms often face chicken-and-egg problem. The platform has to figure out a way to get both participants on board and value to either of the participants through this strategy of cross-subsidization based on the elasticity on both the sides of the market. Entry barriers are more than expected such as switching costs, network effects and so on. Given the layers of practices and multiple stages of interactions, one common loophole in the approach of the regulators and antitrust authorities is in the process of drafting policies by applying the traditional 'one-sided' logic in place of a 'two-sided' logic. The Commission decided certain platform cases in similar patterns- competition was compromised with for the sake of innovation. The rationale was well drafted and is supported but it raises the concern about the adaptation of progressive plans to ensure competition by drafting rules to understand market structures other than the traditional market to emphasize on their specific needs and requirements.

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[103]As available at https://unctad.org/meetings/en/SessionalDocuments/ciclpd54_en.pdf. last accessed on 27.11.2019

[104]Exploitative behavior is inclusive of consumer privacy, value of user data, content creators especially news producers.

[105]Merger eliminates the "*potential competition*" and includes "*killer acquisitions*" such as acquiring a company with the express purpose of closing it down. The conduct of the market players includes concerns that the dominant platforms can leverage the dominance into adjacent markets while possibly protecting their core market in the process. In this context the case references of Google Shopping, Google android and Google AdSense can be read for the observations of the European commission on competitive principles and policies. As available at https://www.itsworld.org/wp-content/uploads/2019/05/Friso-Bostoen.pdf last accessed on 27.11.2019.

Platform Markets and/or multi-sided platforms are unique in terms of their features. It would require a more wide scope of the competition policies in India and the author understands that it is time for the amendment of the Competition Commission Act, 2002 and to allow the growth of platform markets without compromising on the basic competition policies and rules of the country. These questions will multiply with the digitisation of the economy and thus it is the right moment to strengthen the troughs and ridges of the Act to deal with the requirements of platform market structures and more so to regulate anti-competitive features of platforms. The 2002 Act needs to be rigorously equipped to deal with the platform market structures to regulate such anti-competitive features of platforms through modern forms of predatory pricing. Platform markets are a requirement of a developing economy to ensure larger output given the digitalisation and pedagogy of digital market. India as a developing economy needs the platform but at the same time one of the core requirements of healthy growth is uniform competition.

Recently, the Competition Law Review Committee report submitted to the Union Minister of Finance and Corporate Affairs on 26th July, 2019. It was an initiative to strengthen and re-calibrate competition laws of India with international best practices and the changing economic reality. The committee adopted provisions for a settlement mechanism applicable for contraventions related to anti-competitive agreements in terms of Section 3(4) of the Act and the abuse of dominance under Section 4 of the Act. The review committee suggests of settlement and commitment in respect of anti-competitive behaviours. The report suggests and recommends that the marketplace platforms should adopt self – regulatory measures for search rankings, collection, use and sharing of data, user review and ration mechanism, revision of contract terms and discount policies.

Online travel agencies such as MakeMy Trip and Oyo are being investigated allegedly for imposing vertical restrictions and abuse of dominance by denying market access, predatory pricing, etc. As a part of future research, our proposed model can be extended in the form of an oligopolistically competitive framework and then the issues of abuse of dominance and predatory pricing becomes more relevant.

It would be apt to conclude that the competition laws and policies related to platform markets need fine tuning and recalibration as the committee suggests but it also cannot be ignored that

India lacks the technological exposure and the compliance by the market players will be a daunting task. The amendments could be, therefore, generic in nature to accommodate the multiplying nature of the economy in relation to the platform markets- sparing the rod without spoiling the child. There has to be a clear demarcation between innovation and abuse of dominant position. The next amendment is to what extent we allow for this innovative business models of online platforms to expand. The Commission, in many cases, has passed judgements in favour of allowing for innovation in online marketplaces (like the Flipkart case as already discussed)as the market is at its nascent stage. It would in a way provide the commission an opportunity to understand sector specific needs before making suitable amends in the statute to define the concept of abuse of dominance and the relevant market.

The committees' proposal of the ''leniency regime'' as practiced in the European Union and the emphasis on the commitment prospect in the cases of impact of competition could be implemented by relevant rules drafted for the sector specific needs of platform markets. Since the market type is at the nascent stage the fluidity of rules will allow the market to flourish without the rigidity and the unnecessary roadblocks but with a word of caution on the extent of exploitation of abuse of dominant position.

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THE ECONOMIC IMPACT OF OPEN SOURCE SOFTWARE ON COMPETITION, INNOVATION AND DEVELOPMENT IN INDIA

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Introduction

Open source software ("OSS") is software that is typically free and distributed with its underlying source code under a license that permits users to inspect, improve, customize, and redistribute the code.[i] OSS differs from proprietary software for which the owner or publisher of the software holds exclusive intellectual property rights to the source code.[ii] OSS has gained significant popularity in the last two decades; the number of OSS projects has increased substantially since 2000[iii] through a variety of investments and initiatives by technology firms, public, private, and non-profit organizations, national governments, and international collaborations.[iv]

In this paper, we analyze the role of OSS in competition, innovation, and economic development in India. We first articulate a conceptual framework to assess the economic benefits of OSS to a developing economy such as India. Then, we analyze the role of OSS in economic development in India, with a focus on the contributions of OSS to the information technology ("IT") software and services sector through improved labor market opportunities and higher quality products and services, and mobile communication technology through increased smartphone penetration and expanded access to the Internet.

Conceptual Framework

The designation of property rights for software through the choice of licensing framework—such as making source code "open," or keeping it proprietary—can have a significant impact on the structure and growth of the software industry. Two areas are of particular interest in this setting: first, the characteristics of (proprietary) software that make OSS an attractive alternative; and second, the economic incentives that drive developers to contribute to OSS projects when such participation is typically not directly compensated and firms cannot capture all of the benefits of their contributions.[v]

Key Characteristics of the Software Industry

Two characteristics of software make OSS a potentially attractive alternative to proprietary software: first, software combines high fixed costs of development with low marginal costs of production and distribution; and second, the incentives for development and improvement of software may not be socially optimal.

High fixed costs and low marginal costs. Software has high fixed development costs, and low marginal distribution and production costs. The high fixed costs stem from the iterative nature of software development—code is written, tested, rewritten, debugged, and updated frequently.[vi] However, it is relatively inexpensive to create an extra copy and deliver it to a new customer[vii]—*i.e.*, software exhibits large economies of scale. Because it is socially optimal for price to equal marginal cost,[viii] the optimal price of software is likely very low, but proprietary software cannot be priced at marginal cost without discouraging investment.

In theory, governments could compensate proprietary software firms for their fixed development costs in exchange for (low) optimal pricing for proprietary software. However, such policies would be impractical—it is challenging to set up software procurement contracts to align incentives regarding quality and scope—and likely politically unfeasible. Alternatively, governments could (and as described below, often do) promote or encourage the use of OSS. This could improve welfare[ix] because the price of OSS is close to its marginal cost—OSS is often available for free or at a low distribution cost.[x] Increased use of OSS could therefore move output closer to the efficient level, expanding software output without necessitating government transfers to the private sector.

Incentives for software development and improvement. Innovation is key to software, both in the development of major releases and of incremental fixes of errors in the source code ("bugs"). Incentives for proprietary software development may be too weak,[xi] especially for software designed locally in developing countries[xii] where the protection of intellectual property rights in proprietary software is particularly difficult.[xiii] OSS can help spur innovative software development and customization in several ways.

First, OSS is better positioned for incremental bug fixing, as broad availability of source code and large numbers of beta-testers and co-developers make bug detection and fixing less costly

and more efficient.[xiv] Second, contributions to OSS are typically public,[xv] making individual developers' performance publicly observable and thus increasing incentives to contribute.[xvi] In contrast, individual contributions at commercial companies are rarely publicly observable.[xvii] Third, OSS is typically more flexible and adaptable to user needs: sophisticated users can develop and modify OSS to fit their individual needs, thereby spearheading innovation by identifying promising features and extensions of existing products.[xviii] In contrast, proprietary software has less immediate user feedback and therefore resources may not be optimally allocated.[xix]

While OSS incentivizes individual innovation, the creation of customized versions of the underlying source code can lead to forking. Forking, also called fragmentation, occurs when users of open source code create a separate copy of the original source code and then alter it.[xx] As a result, changes and innovations developed through forking may not be adopted in the original source code and, in some cases, may lead to incompatibility amongst versions of the software.[xxi] Thus, although OSS can spur innovation, it may also delay the universal adoption of innovation, or silo innovation to particular fragmented populations. This can be particularly challenging in mobile operating systems that are frequently customized by equipment manufacturers.[xxii] For example, the failure of mobile operating system Symbian, which became open source in 2008, has been attributed in part to fragmentation.[xxiii] As such, it can be critical for OSS projects to have a central authority or leader that initiates, coordinates, or guides innovation within well-defined boundaries.[xxiv] Some OSS projects, such as Android, maintain such boundaries by encouraging modular customizations compatible with the original project and discouraging excessive forking by employing compatibility guidelines.[xxv] Such initiatives have been critical to Android's widespread adoption and developer network.[xxvi]

Incentives to Create OSS

A key economic puzzle is why software developers and firms participate in OSS at all. Factors like altruism fail to explain why open source initiatives exist only in software, and how firms can be organized entirely around OSS.[xxvii] Research suggests alternative incentives to create OSS.

Short-term benefits of individual contributions to OSS development include increased productivity through contributors' ability to develop personalized solutions, and finding

intrinsic pleasure in learning new skills on self-selected projects.[xxviii] In the longer term, contributions to OSS may be beneficial to software developers because worker skill is more easily observed from contributions to OSS, and thus can serve as a signal of quality to potential employers or peers.[xxix] Research also indicates that the benefits of contributing to an OSS project reflect network effects—*i.e.*, they are positively related to the project's visibility and probability of success, so developers contribute to projects to which others are also contributing.[xxx]

Firms also develop OSS for several reasons. First, firms may benefit from the visibility and reputational benefits of being a core contributor to or manager of an OSS project, such as by supplying commercial technical support.[xxxi] For example, Red Hat has monetized its custom distribution of Linux, a family of OSS operating systems, by providing support services.[xxxii] Second, a firm's entry-level OSS project may increase user interest in a more advanced proprietary product.[xxxiii] For example, Cloudera and Hortonworks contribute to certain OSS projects, but also provide fee-based versions under a commercial license.[xxxiv] Finally, OSS development can help companies attract talented developers with relevant skills that can be assessed based on contributions to OSS prior to being hired.[xxxv]

Why OSS Is Particularly Relevant in Developing Countries Like India

Lower prices and increased output can be particularly meaningful in developing countries like India, especially in high-impact sectors such as IT and mobile communications. First, the higher price of proprietary software may have a greater detrimental impact in developing countries than in developed economies. When incomes are low, a higher proportion of the population may be unable to afford proprietary software, decreasing short-term efficiency, and potentially curbing long-term innovation by reducing the pool of potential users/developers. While a traditional, albeit illegal, way to sidestep this issue has been software piracy,[xxxvi] anti-piracy enforcement has made software prices more salient in developing countries after successful efforts such as the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement of the World Trade Organization.[xxxvii]

Second, given the region-specific needs and linguistic diversity of Indian consumers, the ability to adapt software for different uses and different languages is particularly important. Proprietary software developers may lack sufficient incentives to innovate, especially in

countries where piracy is more common,[xxxviii] and therefore may not adapt their software to meet localized needs and invest in local benefits, such as language customization and network integration.[xxxix] OSS, on the other hand, enables local developers to incorporate localized content, thereby fostering greater inclusivity.[xl] For example, several smartphone manufacturers use Indus OS, a modified version of Android that is available in 12 regional languages.[xli] Customizability is particularly valuable for users in low-income areas who access the Internet with older hardware.[xlii] For example, Linux-based operating systems such as Ubuntu have been adapted to offer "lightweight operating system" distributions—in Ubuntu's case, Lubuntu—which are designed for use on computers with lower memory and processing speeds.[xliii]

Finally, developers in countries like India may use contributions to international OSS projects as a way to signal their capabilities, and more broadly, promote the availability of offshore talent to a broader global IT community.

Role of OSS in Economic Development in India

In this section, we explore the role of OSS in economic development in India. First, we explore the contributions of Indian developers to OSS projects, and how those contributions intersect with India's growing IT sector. Second, we explore the role of OSS in India's public and private sectors. Lastly, we explore a key channel through which OSS has contributed to economic development in India: the use of OSS operating systems in mobile devices.

OSS and India's IT Sector

Contributions to OSS can allow software developers to signal their skills to potential employers. Because contributions to OSS are visible across borders, signaling can be particularly valuable in a country such as India, with a significant cross-border IT and software outsourcing sector.

Using annual surveys conducted by *Stack Overflow*, a well-known question-and-answer website used by professional developers and programming enthusiasts, we explore the importance of OSS to developers.[xliv] According to *Stack Overflow*, its survey is "the largest and most comprehensive survey of people who code around the world."[xlv]

First, 2019 survey results indicate that OSS contributions are particularly important to developers in India. Developers in India contributed to OSS more frequently than developers from most of the countries surveyed, with more than 17 percent of Indian respondents indicating that they contributed to an OSS project at least monthly (**Figure 1**).[xlvi]

Figure 1

Share of *Stack Overflow* Survey Respondents That Contributes Monthly or More to OSS Top Ten OECD and Non-OECD Countries by Number of Respondents

2019
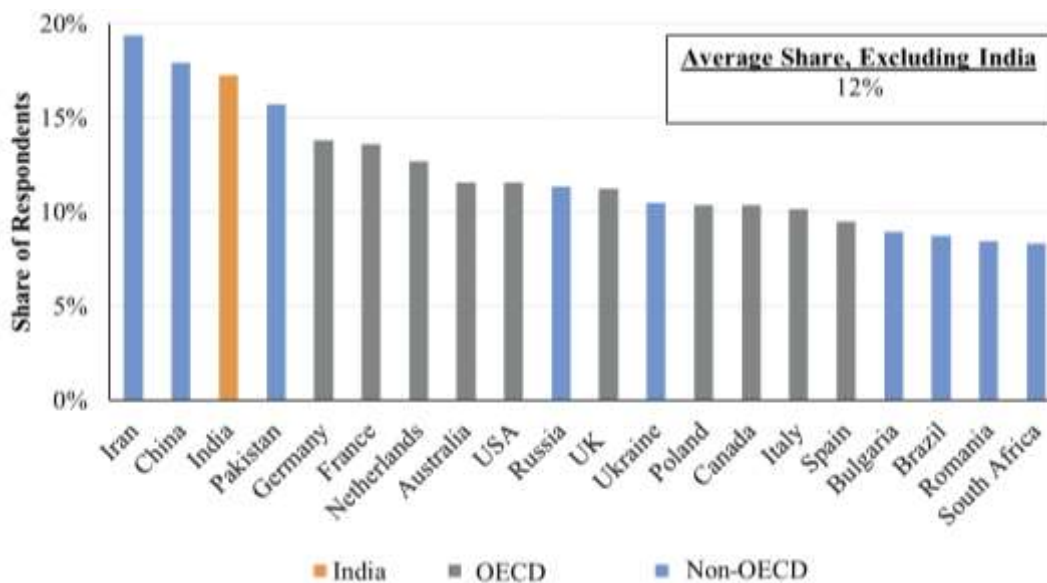
Second, 2017 survey results indicate that signaling to future employers is an important factor for OSS contributors in India—respondents in India were more likely to respond that OSS contributions were an important consideration in hiring than other respondents. As shown in **Figure 2**, almost 40 percent believed OSS contributions were important, compared to less than 25 percent and 30 percent from OECD and non-OECD countries, respectively.[xlvii]

Figure 2

Share of *Stack Overflow* Survey Respondents That Believes OSS Contributions Are an Important Consideration in Hiring

2017
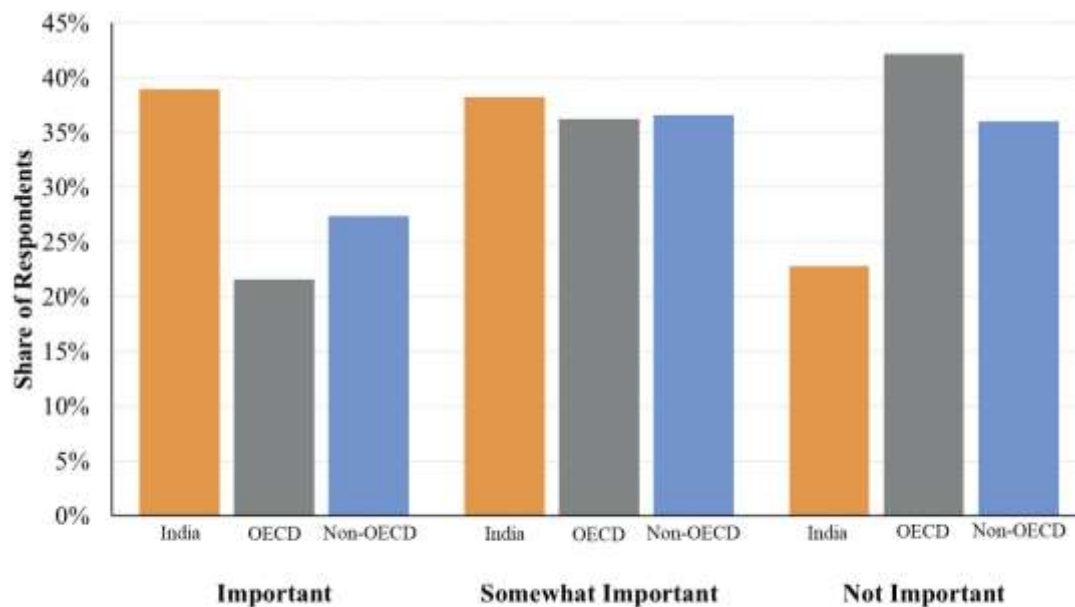
The importance of OSS to Indian developers is particularly critical in the context of India's large and growing IT sector. India's IT sector is sizable—the IT and business process management sector is estimated to have contributed $181 billion to India's GDP in 2018.[xlviii] From 2000 to 2014,[106] the IT software and services industry[107] was the third fastest-growing industry in India in terms of employment, and one of the fastest-growing IT software and services industries in the world.[xlix] India has overtaken OECD countries in terms of the share of the non-agricultural workforce employed by the IT software and services industry as shown in **Figure 3**.[1]

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[106]   The latest release of the World Input-Output Database's Socio Economic Accounts provides data for the period from 2000 to 2014.
[107]   We use IT software and services to refer to the International Standard Industrial Classification industry J62_J63, which includes computer programming, consultancy and related activities, and information service activities.

Figure 3

Share of Non-Agricultural Employed Population in the IT Software and Services Industry

2000-2014
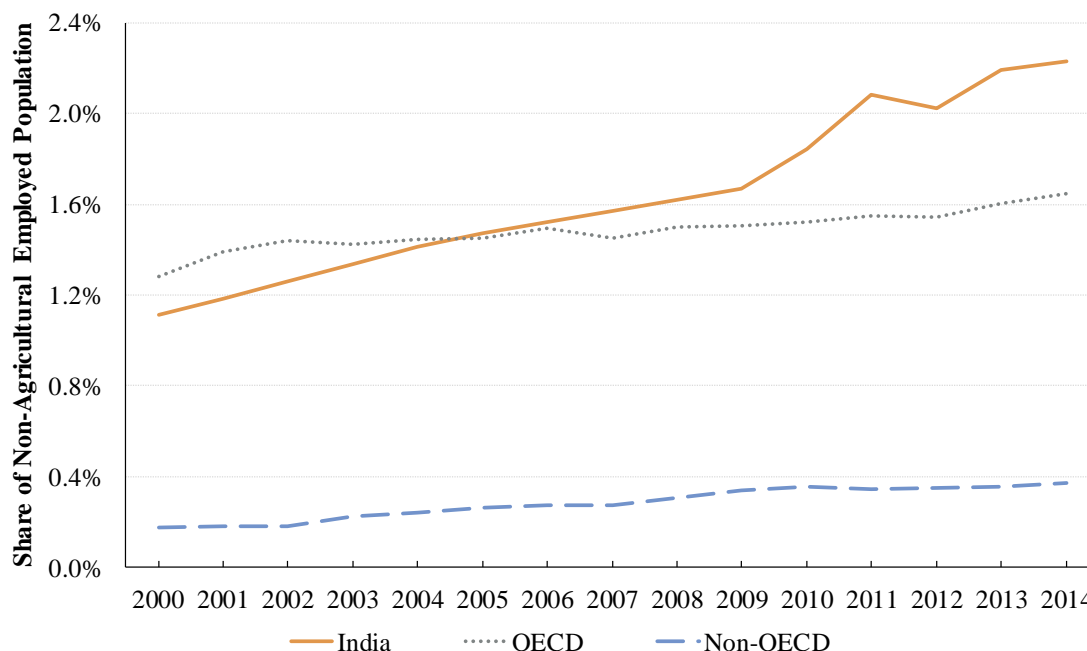
The strong interest in OSS by Indian developers combined with the large and growing IT sector presents a significant opportunity for India. Research has found that use of OSS has the potential to lead to higher quality software products by creating faster feedback loops and continuous improvements to software.[li] The size and growth of India's IT sector positions it to benefit from using OSS to deliver innovative products and related support services while also creating employment opportunities for Indian software engineers and developers. The opportunities presented by OSS are already being recognized in India's IT sector, as demonstrated, for example, by the recent participation of Infosys (India's second largest IT firm) in Open Invention Network—a global OSS initiative with over 2,000 members including Google, IBM, and Toyota.[lii]

Focus on OSS by the Government, Firms, and Other Organizations

The national government and several state governments in India have recognized the benefits offered by OSS. The Ministry of Information and Technology has promoted the use of OSS in India for the last 15 years. In 2004, it created the National Resource Centre for Free & Open Source Software.[liii] In 2014, it formalized a policy to promote the use of OSS by the Government of India.[liv] Further, OSS has been key to many aspects of Digital India, a flagship

initiative launched in 2015 that promotes universal digital access.[lv] Digital India OSS projects include the development of e-governance systems and the use of "open APIs" to promote software interoperability in e-governance.[lvi]

This push towards OSS has also resulted in several public initiatives by state governments such as the IT @ School project in Kerala, which replaced the Windows operating system on 50,000 desktops across 2,800 schools in the state with an OSS operating system. Not only did Kerala save $10.2 million (accounting for switching costs), but many schools have started developing their own OSS applications for teaching purposes.[lvii] Other states such as Tamil Nadu, Uttarakhand (formerly, Uttaranchal), and Assam, have also pursued the implementation of OSS.[lviii]

The value generated by OSS in the provision of general business services is demonstrated by the prevalence of Linux distributions in a variety of systems: the Linux kernel[108] ran 82 percent of the world's smartphones, 90 percent of public clouds, and 99 percent of supercomputers as of 2017.[lix] Leading companies and organizations in India have adopted OSS, for reasons including cost savings, scalability, and improved performance.[lx] For example, the National Stock Exchange and the Bombay Stock Exchange use Red Hat's distribution of Linux.[lxi] Insurance companies Life Insurance Corporation and New India Assurance Company have also migrated to Linux, generating estimated savings of $8.75 million and $16.7 million, respectively.[lxii]

OSS Use in Mobile Platforms

Perhaps the most noteworthy example of the role of OSS in India is the use of OSS mobile operating systems[109] such as Android, KaiOS, and Tizen in smartphones.[110] The availability of these low-cost OSS mobile operating systems has played a significant role in expanding access to the Internet and increasing competition, innovation, and welfare in many developing countries, especially India.

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[108]   "Kernel" refers to a component of the Linux operating system that is the core interface between the physical hardware and the processes run on it.
[109]   We use "OSS mobile operating systems" to refer to operating systems licensed as OSS and/or developed based on OSS.
[110]   We use "smartphone" to refer to any Internet-enabled mobile device, including "feature phones," which are Internet-enabled mobile devices that lack certain advanced functionalities.

Importance of mobile devices in India.

Mobile devices are a particularly important mechanism for improving social and economic welfare in developing countries—they have enabled the population in poor and remote areas to leapfrog the limitations of fixed telecommunications infrastructure, providing benefits that we discuss further below.[lxiii] Mobile subscriptions have increased exponentially in the last two decades, from less than 5 million in 2000 to well over a billion today, while a large number of Indian consumers have sidestepped fixed/landline telephones altogether.[lxiv]

Mobile devices also play a critical role as the primary point of access to the Internet in developing countries, including India. Almost 80 percent of Internet page views[111] in India now occur via smartphones.[lxv] As discussed below, OSS mobile operating systems such as Android have accelerated widespread access to smartphones, allowing Indian consumers to bypass fixed Internet connections altogether.

OSS mobile operating systems in India.

There are several OSS operating systems for smartphones in India including Android, KaiOS, and Tizen, all based on the open source Linux kernel.[lxvi] Android was first released in 2008, and has remained the most widely used smartphone operating system globally since 2012.[lxvii] Tizen was launched in 2011 and is supported by the Linux Foundation (although it is no longer used in new mobile devices).[lxviii] KaiOS entered the marketplace in 2017—it is now by some measures the third largest mobile operating system worldwide after Android and iOS.[lxix] Collectively, OSS mobile operating systems are currently used in more than 95 percent of smartphones in India.

Impact of OSS mobile operating systems on OEMs and consumers in India.

OSS mobile operating systems have played an important role in the entry of original equipment manufacturers ("OEMs") and in smartphone prices in India. The rise of OSS mobile operating systems, in combination with decreased regulation and increased consumer demand, has resulted in a significant increase in the number of OEMs, a proliferation of smartphone choices, and a steep decline in smartphone prices.[lxx]

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[111]   Page views are measured based on websites tracked by StatCounter.

Smartphones require an operating system to offer their core functionality: the ability to run mobile apps, access the Internet, and facilitate communication. Without OSS operating systems, OEMs entering the marketplace would have two options for obtaining an operating system for their hardware: first, developing their own proprietary operating system, or second, paying to license proprietary software developed by other companies, which the OEMs could not easily customize for their equipment.

The development of proprietary mobile operating systems requires significant upfront investments, as well as large ongoing costs to maintain the systems, posing a considerable barrier to entry.[lxxi] Paying to license a third party's proprietary operating system would avoid fixed development costs, but would also limit the OEM's ability to innovate or differentiate from its competitors with respect to both software and hardware. Proprietary mobile operating systems are typically designed for given hardware specifications, and because the software cannot be modified by an outside party to be compatible with different hardware, the scope of differentiation by a new OEM would be limited.[lxxii]

The availability of OSS mobile operating systems can reduce barriers to entry and ongoing costs to OEMs. OSS mobile operating systems allow OEMs to avoid the substantial costs of developing their own proprietary software from scratch and control ongoing maintenance costs.[lxxiii] Instead, manufacturers can build upon an existing OSS mobile operating system such as Android, customize its features, and adapt it to various hardware configurations. For example, manufacturers can choose to create their own versions of Android, such as Xiaomi's MIUI[lxxiv] and OPPO's ColorOS.[lxxv] Alternatively, they could use Android Go, a distribution of Android optimized for low-end devices with less powerful hardware.[lxxvi] This allows OEMs to offer a wide range of hardware specifications and/or unique software features without the full development costs of proprietary software, thereby enabling OEMs to optimize their product offerings for the particular markets they are targeting.[lxxvii] These benefits can be short-lived, however, if OEM customizations and adaptations do not maintain sufficient compatibility with the original OSS mobile operating system project.[lxxviii] In this setting, OEMs could lose the benefit of wider innovation such as new features, software, and security enhancements.[lxxix] OEMs that follow the Android compatibility guidelines, for example, benefit from access to Android updates and software.[lxxx]

Consistent with the theory of reductions in OEMs' barriers to entry, the number of smartphone OEMs in India dramatically increased from just seven to approximately 80 between 2009 and 2018.[lxxxi] This increase has coincided with lower consumer prices for smartphones, which in turn has fostered greater smartphone penetration. The average selling price for smartphones in India declined by over 34 percent from approximately $244 to $159 between 2010 and 2019.[lxxxii] The JioPhone, launched in 2016 by Indian telecom conglomerate Reliance Industries, runs on KaiOS and currently retails for just $10; it has been heralded as a "game changer" for Indian consumers.[lxxxiii] As of 2019, several other OSS-enabled smartphones are offered at a fraction of the price of the iPhone, the leading "closed" operating system phone manufactured and sold by Apple. For example, Xiaomi's RedmiGo, Samsung's Galaxy A2 Core, and realme's C2, all run on Android and retail at $60, $75, and $85 respectively (compared to the $560 retail price of the iPhone 8).[lxxxiv]

The decrease in smartphone prices, partly driven by the confluence of factors discussed above, has played a vital role in boosting smartphone penetration in India. Low mobile device prices are of particular importance in developing economies for several reasons. First, mobile phone costs have been identified as one of the key barriers to ownership. Among Indian respondents to a 2017 GSMA survey, almost 50 percent considered mobile device prices to be a barrier to ownership.[lxxxv] Moreover, because smartphones cost more than *basic* mobile phones, lower prices facilitated by OSS mobile operating systems have the potential to further stimulate smartphone penetration. Second, the elasticity of demand for mobile phones has been shown to be greater in developing countries, *i.e.*, consumers in developing countries are more responsive to changes in mobile phone prices.[lxxxvi] As such, decreased smartphone prices likely had a greater-than-proportional effect on smartphone penetration in India.

Impact of increased smartphone penetration in India. Fueled by the availability of OSS and other factors such as reduced regulation and increased consumer demand, the surge in smartphone penetration has encouraged investment and innovation in the Indian mobile ecosystem in ways that are unique to the social and economic fabric of India. In particular, increased smartphone penetration has played an important role in several critical areas, including efficiency in the economy; innovation in digital payments and banking; development of the mobile apps market; and investments in infrastructure.

First, smartphones have provided Internet access to a large and new segment of consumers. **Figure 4** compares fixed broadband subscriptions and mobile subscriptions (including smartphones and basic mobile phones), and demonstrates that growth in the number of Internet users in India has greatly outpaced growth in fixed broadband subscriptions and in fact closely tracks the growth in mobile subscriptions.[lxxxvii] Research by KPMG indicates that 78 percent of all Internet users and nearly 60 percent of new users in India access the Internet through their mobile devices.[lxxxviii] Meanwhile, only five percent of Internet users in India own personal computers.[lxxxix]

Figure 4

Fixed Broadband Subscriptions, Mobile Subscriptions

and Number of People Using the Internet in India

2000-2018
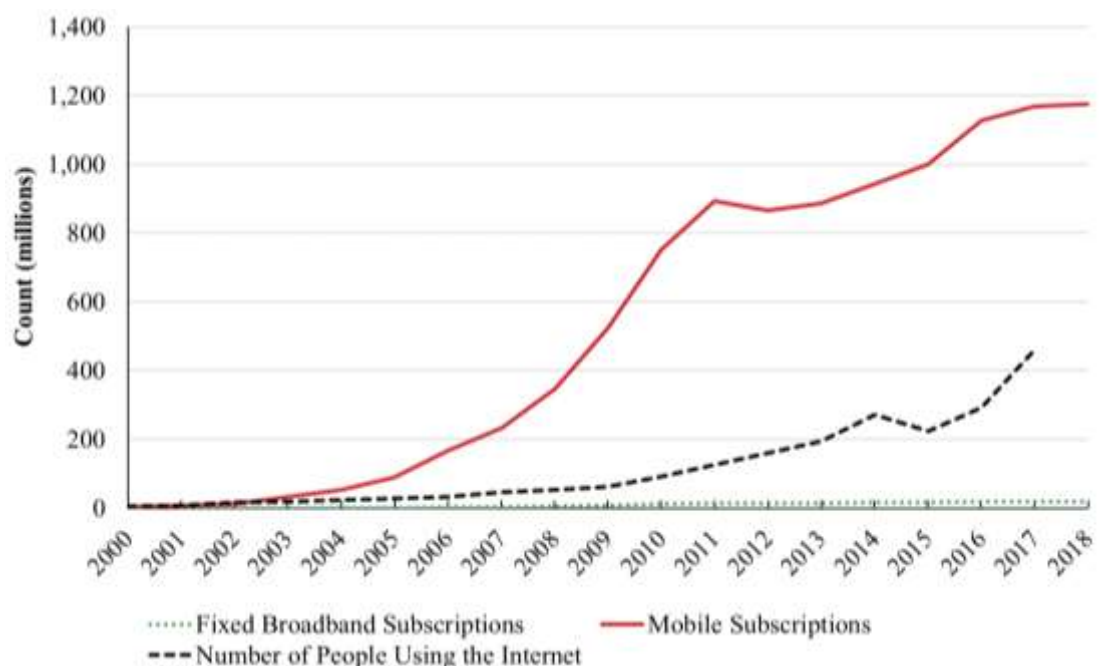
Increased Internet access has been linked to economic growth in India. A 2017 report by the Indian Council for Research estimated that a 10 percent increase in India's total Internet traffic is associated with a 3.3 percent increase in GDP.[xc] A 2016 study estimated that the Internet would contribute to over four percent of India's GDP by 2020.[xci] OSS's important role in spurring growth in the smartphone sector is thus contributing to growth in India more broadly. Increased mobile penetration has contributed to economic efficiency in India, particularly in rural communities. For example, international studies have shown mobile phones: reduce informational asymmetries on price and disseminate information on best farming practices;[xcii]

provide access to real-time weather for climate risk management;[xciii] and empower farmers to grow cash crops that are more perishable but have a higher return.[xciv] The introduction of mobile phones has also been shown to improve market efficiency in other sectors such as fisheries by improving information dissemination and price harmonization, leading to waste reduction.[xcv]

Second, proliferation of smartphones has led to innovation and expansion in digital payment systems in India. In 2014, almost half the Indian adult population was either "unbanked" or "underbanked", *i.e.*, did not have direct access to formal bank accounts or other types of financial accounts such as mobile wallets.[xcvi] In recent years, digital payments have seen momentous growth in India. In 2016, the invalidation of certain paper currency by Prime Minister Narendra Modi incentivized millions to adopt digital payment systems such as PayTM.[xcvii] Within one month of launching in India in 2017, Google Pay (formerly Tez), had more than 7.5 million users and currently has about 40 million.[xcviii] Overall, the value of mobile banking payments increased by a factor of 28 between 2015 and 2019.[xcix]

Research in development economics indicates that improving access to banking services in developing countries contributes to accelerated economic growth, as well as reduced income inequality and poverty. A well-functioning and inclusive financial system provides savings, payments, and risk-management products to the population and helps distribute opportunities more fairly.[c] Without access to these systems, poorer individuals and small businesses must rely on personal wealth or the informal credit sector to invest in their education, become entrepreneurs, or take advantage of growth opportunities, or forego such opportunities altogether. The McKinsey Global Institute estimated that digital finance could boost annual GDP in India by $700 billion by 2025 through increased productivity, investment, and labor supply.[ci]

Third, OSS mobile operating systems have contributed to the development and growth of the mobile apps economy in India. With over 400 million smartphone users in 2017[cii] and annual app downloads of 7.7 billion, India was ranked as the fourth largest app economy in the world.[ciii] Between 2016 and 2018, India experienced a 165 percent growth rate of app store downloads, and in Q1 2019 became the leading country in app downloads worldwide.[civ] In addition, in 2018, India had the highest number of app downloads worldwide on Google Play—

the official app store for the Android operating system—followed by Brazil and the United States.[cv]

Mobile apps provide Indian consumers access to critical services, resources, and information in key areas such as health information and services, news, digital payments and banking, education, retail services, and agriculture.[cvi] For example, the Practo app allows patients to find doctors, upload medical records, and schedule home delivery of medicines, while PayTM provides Indian consumers the ability to make mobile payments.[cvii] As another example, Flipkart, India's leading e-commerce marketplace, has a significant mobile presence: as of 2015, over 10 million customers had installed the Flipkart app, and more than half of its business was generated through its app and mobile website.[cviii]

Demand for customized apps across multiple industries has stimulated innovation tailored to the needs of Indian consumers. Some examples include Buddy4Study, which reduces information asymmetry in scholarships; the Chennai Flood Map, which addresses navigating the city of Chennai during a natural disaster; and FarMart, which helps farmers rent machinery.[cix] The tremendous demand for and the proliferation of mobile apps has in turn created employment opportunities—a recent study estimated that as of August 2019, there were 1.67 million jobs (including indirect and spillover jobs) related to the mobile app economy in India.[cx]

Fourth, expansion in smartphone penetration has generated large investments in technology-related infrastructure in India. For example, Reliance Jio has spent $35 billion to build an all-4G network throughout India that covers over 200,000 villages.[cxi] Google has begun providing Wi-Fi hotspots to serve the approximately 23 million people who ride trains daily, with 400 hotspots installed in Indian train stations to date.[cxii] Similarly, Amazon has committed to investing at least $5 billion in India, including opening a new cloud region and a software engineering and development center in Hyderabad.[cxiii] Such investments and growth in technology-related infrastructure are bridging the digital divide and facilitating inclusive growth.[cxiv]

Conclusion

OSS has spurred competition, innovation, and economic development in India along several critical dimensions. It has contributed to many facets of the Indian economy by facilitating greater economic efficiency, reducing the digital divide, and fostering inclusive development. OSS has been particularly vital to the IT and mobile phone sectors in India. These sectors are critical to development and growth in India and are major contributors to the Indian economy— the IT and business process management sector contributed $181 billion to India's GDP in 2018 and the mobile economy contributed $140 billion in 2015.[cxv] In the IT sector, OSS has provided Indian software engineers and developers a valuable launching pad to seek opportunities across borders, thus promoting India's status as an IT powerhouse. Development and support of OSS initiatives will continue to be particularly beneficial in a country like India with a significant and flourishing IT sector.

More broadly, the exponential growth in access to smartphones, fueled in part by low-cost OSS mobile operating systems such as Android, has brought Internet access to the masses, spurred economic development and encouraged investment and innovation in the Indian mobile ecosystem in ways that are unique to the social and economic fabric of India. OSS has expanded critical access to health information and services, news, digital payments and banking, education, retail services, and agriculture.

OSS has already attracted interest by national and state governments, technology and IT companies, and researchers within India and worldwide. In light of the role played by OSS in high-impact sectors in India, and its effects on consumers and the economy at large, stakeholders should continue to carefully examine OSS and its role through a broad lens, especially in the development of policy and regulation.

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