Convergence-based Cross Market Entry: Welfare & Implications for Competition Policy

Victor Pavón-Villamayor
Senior Economist
OECD-ITAM Expert Group in Regulatory Reform, Mexico
victor.pavon-villamayor@alumni-oxford.com
&
Competition Policy Director, Gabinete Económico, Mexico
vpavon@gabinete-economico.com.mx

ABSTRACT
This paper uses a simple two-period game-theoretic analytical framework of cross market entry with firm-specific and “spillover” innovation to discuss some of the economic implications of digital convergence. The analysis identifies the whole set of possible equilibria in order to characterize the two main patterns of technological diffusion: continuous and fragmented. Continuous diffusion occurs when a firm always operates on the edge of its technological frontier. In contrast, fragmented diffusion occurs when a firm might not find optimal to operate all the time on this frontier. The impacts of these two different patterns of technological diffusion on standard measures of social welfare are also discussed in the context of the trade-off between the duplication of fixed costs and the benefits that cross market entry brings in terms of aggregate innovation. The analysis shed light on the trade off between socially efficient cross market entry by a dominant operator and competition policy distortions.

Keywords
Digital convergence, entry, competition policy, innovation, technological diffusion.

BIOGRAPHY
Ph. D. Economist (Oxford) with areas of expertise in competition policy and regulation. He has been official for the Mexican Telecommunications Commission and consultant in competition policy for LECG (Brussels). Currently, he is Senior Economist on Regulatory Reform in a joint project between the OECD, ITAM and the Mexican Government.

INTRODUCTION
Historically, telecommunications has been perceived as an industry mainly devoted to the provision of voice communication. As a consequence, telecommunications was usually treated differently from other related industries such as data communication or broadcasting. During the last decade, however, improvements in Internet-based technologies have increased the substitutability between packet- and circuit-switching data transmission which has dramatically changed the general landscape in the industry. On the one hand, packet-based data transmission has proved to be an effective substitute for analogue transmission in most of the services provided by telecommunications operators. On the other hand, recent technological improvements have also broadened the service capabilities in the cable industry, in which the joint supply of television, voice and data services have become the standard service. The blurring of the market boundaries that stems from improvements in digital transmission technologies has recently been described as a process of digital convergence.
The most remarkable feature of this digital convergence is the presence of strong economies of scope that, by cutting across formerly separated markets, create incentives for incumbents in one particular market to enter into neighbouring industries. Digital convergence is then inherently linked to a process of cross market entry (Greenstein and Khanna, 1997). In many countries, for example, incumbent telephone companies have been facing strong competition from cable-TV companies, which have been deploying aggressive “triple play” offers for years. In Mexico, the challenges posed by the process of convergence have been reflected in a set of reforms aimed to “update” the national regulatory framework to the new competitive environment that derives from this phenomenon. In the last years, the most significant changes in the Mexican industry have been the approval of the “Agreement for Convergence” and the implementation of the reforms associated with the Law for Federal Telecommunications and the Federal Law for Radio and Television. A central point in the above set of reforms has been the extent to which they have been conceived according to the principle of technological neutrality; which means that the same services should be treated identically irrespective of the technology used to convey them. A proper discussion of the extent Mexican regulation in the industry has been evolving according to the principle of technological neutrality is, unfortunately, beyond the scope of this paper. Instead, this paper focuses on the incentives for cross market entry that firms have in the absence of regulation and shows that there are some instances in which convergence, although technologically feasible, may not be economically optimal.

This finding is particularly relevant in the Mexican context, where the incumbent (and dominant) operator in the voice communication industry, Telmex, has been prohibited by regulation to enter into a neighbouring market — television — until it satisfies competition authorities with the fulfilment of some regulatory safeguards. In particular, the Mexican Competition Commission has prohibited Telmex to enter into the provision of TV services until this firm can fully satisfy regulators with the provision of optimal conditions for the implementation of number portability, network interconnection and network interoperability. Since this naked restriction to provide technically feasible services poses a significant opportunity cost to the dominant operator, this restriction can also be interpreted as a monetary transfer from the incumbent to regulators (Tovar Landá, 2008). The recent and successful implementation of number portability in Mexico has cancelled out the first of these three regulatory restrictions. Nevertheless, there is still a lot of debate with regards to the extent Telmex has fulfilled the other two regulatory conditions, which are the basis of the Plan Técnico Fundamental de Interconexión e Interoperabilidad. The fact is that Telmex has not entered the market for the provision of TV as yet.

This cross market entry impasse can be rationalized through two different analytical perspectives: a “bargaining” and a “value of waiting” approach. In a bargaining approach, the dominant operator is indeed eager to enter immediately into the TV market but it is having a hard time to convince regulators on the fulfilment of the imposed regulatory conditions. This is a bargaining scenario because the dominant operator bargains with regulators over the scope of the incumbent’s implemented measures to address the competitive problems in the market. In contrast, in a “value of waiting” approach, the dominant operator deliberately chooses to postpone its cross market entry into the TV market because, although technically feasible, it is not economically optimal to do so. This is a rational decision because there may be some value attached to the option of postponing entry for a future date — the value of waiting. Therefore, in the short run, the dominant operator has incentives to pretend to cooperate with regulators and, provided that competition authorities are not fooled, entry into the TV market is postponed. The dominant operator’s incentives to follow up this strategy change at a future date and hence full cooperation with the competition authorities precedes entry.

This paper provides a basic framework for the analysis of the “value of waiting” approach and it establishes the set of instances in which such analytical framework is relevant. Using a two-period analytical framework of cross market entry with firm-specific but no aggregate innovation (e.g., firms are able to enter adjacent markets by expanding the set of functionalities provided to consumers but, on aggregate, no new functionalities in the industry are created) in the presence of financial savings associated with the postponement of technological investments, a model of convergence-based cross market entry is explored.

\[1\] Bresnahan and Greenstein (1999) have provided a precise account of this phenomenon in the context of the computer industry. Until the late 1970s, the production and marketing of mainframe and minicomputer hardware was conceived as essentially distinct from each other, since the equipments were sold to different customers for different purposes. However, technical innovations in the mid-1970s blurred these distinctions and the manufacturers of mainframes and minicomputers started to compete with one another in the segment of users of powerful large-system computers. In this way, markets that were perceived as distinct in the 1970s were forced into contact in the early 1980s.
The analysis shows the presence of two equilibria. The first equilibrium outcome is characterised by a bilateral cross entry—the two firms enter into each other markets—with continuous convergence—in each of the two periods considered, firms expand their provision of functionalities simultaneously. This first equilibrium is referred as continuous because there is no a pattern of technological diffusion in the sense that both firms are always operating on their technological frontiers. This equilibrium outcome rationalise the notion that, when regulatory restrictions are absent, firms will always find profitable to provide all the services that are technically feasible. The second equilibrium outcome is characterised by bilateral cross entry as before but in this case a pattern of diffused convergence is observed—one of the firms not always operates on its technological frontier. This is an equilibrium of diffused convergence because, during the first period, one of the firms delays entry in order to make the most of the second-period financial savings that derive from the postponement of technological investments. The interesting aspect of this second equilibrium is that it shows the existence of instances in which a firm deliberately decides to postpone entry even when this is technologically feasible. A slightly different interpretation of this result provides interesting insights for the analysis of some aspects of the convergence process in Mexico.

The rest of the paper is organised as follows. Section 2 describes the general analytical framework used to address the issue of convergence-based cross market entry. In section 3, a full description of the equilibrium outcomes of the model are presented. This section also provides some welfare comparative statics of the equilibrium outcomes. The final part, section 4, discusses some of the policy implications of the results in the context of the process of convergence in Mexico.

THE MODEL

This section briefly describes the analytical framework over which the results of the paper are built up. The section is divided in three parts: players, strategies and payoffs.

Players. There are two players or firms: platform A and platform B. Platform A is the incumbent in market A whereas platform B is the incumbent in market B. Platforms face a representative consumer to whom they provide a bundle of service functionalities (Lancaster, 1966). However, the set of functionalities that a platform can provide at any point in time is technologically bounded. In particular, assume that the functionality space in this convergent industry can be described by a rectangle of length 1 and height $4\theta$, where $\theta > 0$. The parameter $\theta$ represents a standardised measure of the set of functionalities that are and can be provided in subsequent periods in the industry. In the initial configuration of the industry, it is assumed that the functionality space is equally divided between the two technological platforms so that each of them provides a set of functionalities of magnitude $2\theta$. Furthermore, it is assumed that, in the initial configuration of the industry, the set of functionalities provided by platforms are mutually exclusive: the set of functionalities that platform A provides to consumers cannot be provided by platform B and vice versa. Therefore, the initial configuration of the industry can be characterised as a scenario of no convergence due to this mutual exclusiveness feature. Figure 1 below shows a graphical representation of this functionality space.
At the initial industry configuration, platform A provides the set of functionalities contained in the space $A + B$ while platform B provides the set of functionalities contained in the space $C + D$. In order to keep our analysis as simple as possible, it is also assumed that platforms are able to perfectly price discriminate so that consumer surplus is always identical to zero. The market structure in the two convergent industries is, however, different: market A is monopolistic while market B is characterized by the presence of a competitive fringe that poses a restriction in the pricing behaviour of firms. Since platforms can perfectly discriminate, at the initial configuration, the equilibrium prices prevailing in each of the convergent industries are given by $p_a = 2\theta$ and $p_b = 2\theta\beta$, respectively, where $0 < \beta < \beta < 1$. Observe that, when $\beta = 1$, the competitive fringe does not pose any competitive constraint over the pricing behaviour of platform B while, when $\beta < 1$, the competitive fringe imposes a price behaviour constraint on this platform since $p_b(\beta < 1) < p_a(\beta = 1)$.

**Strategies.** Consider a two-stage game of complete but imperfect information. Platforms move simultaneously in each of these two periods. In the first period, the set of strategies available to any of the platforms are:

1. Enter the adjacent market through an expansion of functionalities of magnitude $\theta$.
2. Stay out of adjacent market (e.g., keep service provision constant)

In the second period, the set of strategies are identical to the ones described for period one, provided platforms have expanded functionalities in the first period. However, if platforms did not expand functionalities in the first period, the set of strategies available during its second period are given by:

3. Enter the adjacent market through a total expansion of functionalities of magnitude $2\theta$.
4. Enter the adjacent market through a partial expansion of functionalities of magnitude $\theta$.
5. Stay out of the adjacent market (e.g., keep service provision at the level of the initial industry configuration).

The figure in the appendix illustrates the extensive form of the cross market entry game. It is also assumed that platforms are committed to stay in the market (e.g., provide services) during the two periods.

**Payoffs.** Payoffs are the sum of the undiscounted profits obtained during the first and second periods. In order to determine explicitly the payoff functions, consider the following definitions associated with consumer behaviour.

**Definition 1.** Denote as $\chi_a$ and $\chi_b$ the set of aggregate functionalities associated with platforms A and B, respectively. When $\chi_a \cap \chi_b = \emptyset$, consumer’s willingness to pay per platform equals the level of (non-overlapped) functionalities provided by each platform.

**Definition 2.** When $\chi_a \cap \chi_b \neq \emptyset$ and $\chi_a > \chi_b$, consumer’s willingness to pay to A, WTP(A), is equal to the entire set of aggregate functionalities provided by A while consumer’s willingness to pay to B, WTP(B), is equal to the size of no-overlapped functionalities provided by B. A parallel behaviour is assumed when $\chi_a \cap \chi_b \neq \emptyset$ and $\chi_b > \chi_a$, mutatis mutandis. When $\chi_a \cap \chi_b \neq \emptyset$ and $\chi_a = \chi_b$, consumer’s willingness to pay for overlapped functionalities is equally divided across A y B while non-overlapped functionalities are fully paid to the corresponding provider.

**Definition 3.** The pricing constraint stemming from the presence of the competitive fringe in market B remains bounded within this market provided there is service differentiation across platforms. The pricing constraint stemming from the competitive fringe is extended to market A otherwise.

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1. There is complete information because movements made by nature are excluded. The imperfection of information arises because a setting of simultaneous moves is considered. The equilibrium concept used is sequential equilibrium.
In order to illustrate the construction of payoffs in the model, consider first the determination of prices in the first period. Three possible scenarios might occur in the first period: no entry, unilateral entry or bilateral entry. The prices associated with each of these possible outcomes are given by:  

\[
\begin{align*}
\text{No Entry} & : \begin{cases} 
\rho_a = 2\theta \\
\rho_b = 2\theta \beta 
\end{cases} \\
\text{Unilateral Entry} & : \begin{cases} 
\rho_a = 3\theta \\
\rho_b = \theta \beta 
\end{cases} \\
\text{Bilateral Entry} & : \begin{cases} 
\rho_a = 2\theta \\
\rho_b = 2\theta \beta 
\end{cases}
\end{align*}
\]

Consider first the case of no entry. By definition 1, consumer’s willingness to pay to each platform is equal to the set of non-overlapped functionalities, which in this case is equal to \(2\theta\) per platform. Observe, however, that the price charged by platform B is adjusted by a factor \(\beta\) in order to reflect the pricing constraint that the competitive fringe poses on the incumbent in market B. Since in this case markets A and B are totally independent, the pricing constraint that derives from the presence of the competitive fringe in market B remains totally bounded within this market. Consider now the case of unilateral entry. According to definition 2 above, conditions \(\chi_a \cap \chi_b \neq \emptyset\) and \(\chi_a > \chi_b\) hold. This implies that WTP(A) equals to the entire set of functionalities provided by this platform, \(3\theta\), while WTP(B) is reduced to the set of non-overlapped functionalities provided by B, \(\theta\). Note, as before, that WTP(B) is also adjusted by a factor \(\beta\) as a result of the constraints posed by the competitive fringe in this market. In the same vein, observe that the pricing constraint stemming from the competitive fringe remains bounded within the limits of the smaller market B. Finally, consider the case of bilateral entry. According to definition 2, conditions \(\chi_a \cap \chi_b \neq \emptyset\) and \(\chi_a = \chi_b\) hold. In this case, each platform is fully rewarded for their set of non-overlapped functionalities, \(\theta\), plus half of the set of overlapped functionalities, \(\theta\). Therefore, in the case of bilateral entry WTP(A) equals to \(2\theta\) while WTP(B) equals to \(2\theta \beta\). This is because the pricing constraint that derives from the competitive fringe still remains bounded within the limits of market B since there is still some degree of product differentiation.

Consider now the cost structure in the industry. Suppose that, when platform \(j = a, b\) provides functionality \(\theta\), it incurs an operating cost of magnitude \(\theta k_j\), where \(\gamma_2 \leq k_j < 1\), so that operating costs are a fixed proportion of the level of functionalities provided. For simplicity, in the following it is assumed that \(k_j\) is symmetrical across platforms: \(k_a = k_b = k\).

It is also assumed that the costs of the investments incurred in the past to provide the initial level of functionalities \(2\theta\) has been fully recovered in previous periods. In other words, the problem associated with the recovery of past fixed costs is excluded. The expansion of functionalities into new markets involves, however, some fixed costs. In the first period, platform \(j = a, b\) may expand functionalities by magnitude \(\theta\) by incurring in a fixed cost of \(F = \theta/2 > 0\). The cost of functionality expansion in the second period, however, is contingent to the expansion of functionalities in the first period. In particular, it is assumed that, whenever a platform expanded functionalities in the first period, the cost of expanding functionalities in the second period by \(\theta\) is equal to \(F\). In contrast, when a platform did not expand during the first period, the expansion of functionalities during the second period can be partial or total. When the expansion of functionalities is partial (e.g., the set of functionalities created in the second period were available since the first period) the cost of expanding functionalities by \(\theta\) is given by \(\sigma F\), where \(\gamma_2 \leq \sigma < 1\). The intuition behind this assumption is that there are savings in the acquisition of a non-state-of-the-art technology in the expansion of functionalities. When the expansion of functionalities is total (e.g., the set of functionalities created in the second period includes both functionalities that were already available in the first period plus functionalities that were only available during the second period) the cost of expanding functionalities by \(2\theta\) is given by \((1 + \lambda)F\), where \(\sigma < \lambda\). The intuition behind this assumption also relates to the presence of some savings in the acquisition of a state-of-the-art technology in cases in which functionality expansion did not take place in the first period.

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3 In the case of unilateral entry, it assumed that platform A is the one entering into the market of platform B.

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Finally, it is also assumed that the pricing constraint that the competitive fringe poses to incumbents in the relevant markets is not particularly strong so that condition
\[ \beta > \frac{1}{4} + \frac{k}{2} \]
holds. This assumption is made only to guarantee some degree of symmetry in the market structure of the industries that are converging.

Finally, it would be useful to illustrate the construction of a couple of payoff functions. Consider first the payoff functions that derive from a strategy of simultaneous functionality expansion in both periods. As illustrated by the figure in the appendix, this scenario is described by the set of strategies leading to the outcome \( N_1 \). The payoff function associated with platform A in this outcome is given by the expression:
\[
\Pi_a(N_1) = 2\theta - 3\beta - F + 2\beta - 4\beta - F
\]
In the first period, platform A’s income derives from two components: a set of exclusive functionalities of magnitude \( \theta \) and a set of non-exclusive functionalities of the same magnitude \( \theta \) —the set of overlapped functionalities in the first period equals \( 2\theta \), but only half of this amount is distributed to platform A. The total operating cost in the first period is the sum of the initial operating cost, \( 2\beta k \), plus the new operating costs stemming from the expansion, \( \beta k \). Finally, observe that there are no savings in fixed costs in the first period since it involves the acquisition of a state-of-the-art technology. In the second period, platform A does not provide exclusive functionalities so that income is now given by \( 2\theta \beta \). This is because the set of overlapping functionalities is now \( 4\theta \) and half of this amount is distributed to platform A. Observe, however, that because there is no service differentiation across platforms, the pricing constraint stemming from the competitive fringe only affects this market and prices are adjusted to reflect this.

\[
\Pi_b(N_1) = 2\theta \beta - 3\beta k - F + 2\beta \beta - 4\beta k - F
\]
Given the symmetry of strategies followed by both platforms at outcome \( N_1 \), it is not surprising that their payoffs functions are identical, except for the case of their incomes during the first period. Incomes are different during the first period because, albeit higher competition between platforms is observed, some degree of service differentiation prevails across platforms.

This implies that the pricing constraint stemming from the competitive fringe prevailing in market B only affects this market and prices are adjusted to reflect this.

**CROSS MARKET ENTRY EQUILIBRIUM OUTCOMES & WELFARE**

This section determines explicitly the equilibrium outcomes of the cross market entry game. It is worth mentioning that the equilibria explored are free entry outcomes in the sense that the government cannot sell licenses or impose taxes as a condition for the operation of a platform in a particular market. The following result follows.

**Lemma 1.** The cross market entry game has two equilibria. A **bilateral entry equilibrium with continuous convergence** arises when the **loss in operating profits** is higher than the **value of waiting** stemming from the postponement of technological investments:
A bilateral entry equilibrium with diffused convergence arises otherwise.

A bilateral entry equilibrium with continuous convergence is characterised by the expansion of functionalities by each platform by magnitude $\theta$ in each period. As established by lemma 1, this equilibrium holds provided that the loss in operating profits lies above of the savings in fixed costs that derive from the postponement of technological investments. The intuition behind this result is as follows. When $\lambda = 1$, there are no savings in fixed costs associated with the strategy of no entry in the first period and expanding totally during the second period. In other words, the strategic value of waiting for a total expansion of functionalities during the second period is zero: $2F - (1 + \lambda)F = 0$. This value should be compared with the underlying loss in operating profits stemming from a strategy of refusing to expand during the first period. This loss in operating profits is given by $\theta(1 - k)$. Since $\theta(1 - k) > 0$ at any time it follows that, when $\lambda = 1$, the loss in operating profits is strictly higher than the strategic value of waiting for the deployment of new technology—which are equal to the savings in fixed-costs stemming from a strategy of waiting for the expansion of functionalities until the second period.

Therefore, when $\lambda = 1$, there is no diffusion in the deployment of technology and platforms compete head-to-head in the marketplace by entering each other markets simultaneously and continuously. Nevertheless, for some values of $\lambda < 1$, the strategic value of waiting may be higher than the loss in operating profits so that platform may find profitable to postpone the expansion of functionalities until the second period. This creates the conditions for the arising of an equilibrium outcome with diffused convergence.

The content of lemma 1 is in line with the findings of the economic literature. For example, when information on technology is perfect, Reinganum (1981) shows that, even when firms are identical, it is possible to find an equilibrium characterised by different adoption dates in technology for the concurring firms and hence, a staggered pattern of diffusion. In a similar spirit, Quirmbach (1986) shows that diffusion, as opposed to immediate technological adoption, occurs when incremental benefits are present and the cost of the new equipment fall over time. In other words, adoptions that yield lower incremental benefits must be deferred until they are justified by lower adoption costs. The following figure illustrates the conditions established by lemma 1.
Figure 2. Characterization of Cross Market Entry Equilibria
for \( k^* = 1/8 \)

Let’s consider now the welfare implications of these two equilibria. As pointed out by Spence (1976), net revenues are not an accurate measure of the social benefits of production since they do not capture consumer surplus. However, when perfect price discrimination is in place, net revenues do measure the social benefits of production since they represent exactly the difference between the net contribution to consumers’ benefits and the costs that the firm incurs. Therefore, it is possible to address the issue of the social benefits of continuous and diffused convergence by analyzing the payoff functions associated with the corresponding equilibrium outcomes. The following lemma states the second result of the paper.

**Lemma 2.** Bilateral entry with continuous or diffused convergence leads to excess entry from a social welfare perspective.

To see this, denote as \( SW_C \) and \( SW_D \) the level of social welfare associated with bilateral entry with continuous and diffused convergence, respectively. It follows that, in the first case, the actual social welfare is given by:

\[
SW_C = 2\theta - 3\theta k - F + 2\theta \beta - 3\theta k - F + 2\theta \beta - 4\theta k - F
\]

while the actual social welfare in the presence of diffused convergence is given by:

\[
SW_D = 2\theta - 2\theta k + 2\theta \beta - 2\theta k + 2\theta \beta - 4\theta k - (1 + \lambda)F + 2\theta \beta - 4\theta k - F
\]

Observe that a social planner would maximize social welfare by providing, at any point in time, the highest level of functionalities at the lowest cost. Given the technological structure considered in this paper, it follows that the optimal level of social welfare, \( SW^* \), is described by condition:

\[
SW^* = 2\theta - 2\theta k + 2\theta \beta - 2\theta k + 2\theta \beta - 2\theta k = 4\theta (1 + \beta) - 8\theta k
\]

This is true because in the context of this paper, cross market entry (convergence) does not expand the set of aggregate functionalities so that social welfare is maximised when the functionality space is fully covered and costs are kept at its minimum level. In other words, social welfare is maximized when each platform remains operating within its initial functionality boundaries and no cross entry is observed. The economic rationale is simple. By avoiding cross market entry, duplication of fixed costs is ruled out and operating costs remain to its minimum level during the two relevant periods. To see
why convergence is wasteful in this context, let’s re-express the social welfare associated with these two equilibria in terms of the optimal level:

$$SW_C = SW' + 2\theta(\beta - 1) - 6\kappa - 4F$$

$$SW_D = SW' + 3\theta(\beta - 1) - 5\kappa - (3 + \lambda)F$$

Unless the negative and positive components contained inside the market distortion term cancel out each other (an unlikely event), convergence is socially inefficient. This is in line with Mankiw and Whinston (1986) finding that, when firms incur fixed set-up costs upon entry in homogeneous product markets, the business-stealing effect always creates a bias toward excessive entry from a social perspective. Therefore, they conclude that in a homogeneous market, entry restrictions are often socially desirable. There is also some empirical support for the phenomenon of excessive entry in relevant markets. Berry and Waldfogel (1999) argue that the free entry into the US commercial radio broadcasting industry has been excessive. They found, for example, that while there were 2,509 commercial stations in the 135 markets analysed under free entry, the socially optimal number was 649. Compared with the average of 18.6 inside stations per market, the social optimum was 4.8 inside stations per market. By ignoring the value of programming to listeners, they estimated a deadweight loss associated to free entry into radio broadcasting of roughly 2.3 billion US dollars per year. This section is concluded with the following corollary associated with lemma 2:

**Corollary.** Cross market entry with diffused convergence is closer to the optimal level of social welfare than cross market entry with continuous convergence:

$$SW' > SW_D > SW_C$$

so that cross market entry with diffused convergence is the second-best optimum.

**POLICY IMPLICATIONS & DISCUSSION**

This paper has explored an analytical framework of technological convergence in which cross market entry is facilitated by firm-specific innovation (e.g., firms are able to expand the set of functionalities provided to consumers through time). A key feature of the framework discussed here is that aggregate innovation was assumed constant so that, in the presence of fixed costs, any cross market entry was characterised as socially inefficient. In other words, plain convergence — the capacity of firms to enter into each other markets with affecting the pool of aggregate innovation — is not necessarily optimal. Therefore, a first policy implication of the analysis is that, in cases in which cross market entry is based almost exclusively on the bundling of services and not in the provision of additional functionalities, entry restrictions may be socially optimal.

It is common to argue, however, that even in cases where no new functionalities are supplied, one of the benefits of cross market entry is higher competition across platforms and thus lower consumer prices and higher consumer surplus. Although this argument remains valid in general, it is not particularly relevant in the context of the framework discussed in this paper since perfect price discrimination — which is always socially efficient — was assumed from the outset and hence transfers between consumers and firms are welfare neutral. Naturally, this strong statement that cross market entry is socially inefficient due to a duplication of fixed costs can be reversed provided cross market entry has a positive and sizeable impact.
on aggregate innovation. In other words, the economic costs associated with cross market entry can be compensated and even dominated by an increase in the level of aggregate innovation (e.g., introduction of higher product diversity).

A second implication of this paper is that there may be a trade off between socially efficient cross market entry by a dominant operator and competition policy. On the one hand, the mechanics of the model lead me to conjecture that the higher the asymmetry across firms in terms of their technological capacity to generate aggregate innovations, the higher the likelihood that the firm with the higher innovation capacity will enter, dominate and crowd out the incumbent in the adjacent market. From a social welfare perspective, this entry and market dominance is efficient since it reduces the size of the market distortion by avoiding the duplication of fixed costs. On the other hand, the dominance of the firm with the higher innovation capacity will increase the likelihood of having unilateral effects so that a trade off between these two forces may arise.

Finally, observe that lemma 1 allows for an alternative interpretation. In that result, a firm benefits from delaying its entry decision because there are some economic rents to be obtained. Similarly, it may be the case that a firm delays its entry decision in an adjacent market because:

I. entry in an adjacent market is conditioned to the facilitation of competition in the market in which the firm is a dominant operator and,

II. in the short run, the competitive conditions in the adjacent market look tough.

These two conditions may create strong incentives for a dominant firm in a market to delay entry into an adjacent industry. This is because the economic value of entering an adjacent market where competition is tough is low. In addition, the size of the rents that are lost by facilitating competition in the market in which the firm is dominant are high. Therefore, as the erosion of rents in the most profitable market is not compensated by the potential gains obtained by entry, a dominant firm may have strong incentives to deliberately delays entry. In order to explore the extent this hypothesis seems feasible in the context of the regulatory prohibition to Telmex to enter the TV market, the following table shows some recent indicators of profitability in the Mexican telephone and TV markets.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Televisa / TV Azteca*</th>
<th>Telmex</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Profit Margin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd/3rd Quarter 2008</td>
<td>16.68%</td>
<td>17.49%</td>
<td>+ 0.81%</td>
</tr>
<tr>
<td>Year 2007</td>
<td>16.33%</td>
<td>22.09%</td>
<td>+ 5.77%</td>
</tr>
<tr>
<td>Operating Margin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd/3rd Quarter 2008</td>
<td>33.99%</td>
<td>31.03%</td>
<td>- 2.96%</td>
</tr>
<tr>
<td>Year 2007</td>
<td>36.27%</td>
<td>31.37%</td>
<td>- 4.90%</td>
</tr>
<tr>
<td>Return on Average Assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd/3rd Quarter 2008</td>
<td>7.94%</td>
<td>12.51%</td>
<td>+ 4.57%</td>
</tr>
<tr>
<td>Year 2007</td>
<td>7.39%</td>
<td>12.35%</td>
<td>+ 4.96%</td>
</tr>
<tr>
<td>Return on Average Equity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd/3rd Quarter 2008</td>
<td>27.17%</td>
<td>58.03%</td>
<td>+ 30.86%</td>
</tr>
<tr>
<td>Year 2007</td>
<td>22.97%</td>
<td>35.34%</td>
<td>+ 12.38%</td>
</tr>
</tbody>
</table>

Note: * The figures reported for Televisa/TV Azteca are the average figures for these two companies.

Figure 3. Indicators of Relative Profitability in the Mexican Phone & TV Markets, 2007-2008
The above empirical evidence is far from being conclusive but seems to provide some support to the view that the market in which Telmex is dominant (telephony) is more profitable than the market in which this firm is planning to enter (TV). If this is truly the case, it may be not surprising to see Telmex failing to fulfil the regulatory conditions that, for the telephony industry, the Mexican Competition Commission established to this operator as pre-condition for its authorization to enter in the TV market. By following this strategy, Telmex may be gaining the required time it needs to ripe the rents from the most profitable market.

REFERENCES


