
ESSAYS on the Economics OF TWO-SIDED MARKETS



Economics, Antitrust, & Industry Studies

David S. Evans

Preface

Given the subject of this collection, there is some irony in how I've chosen to bring these essays to you. Publishing has traditionally been a two-sided model. Publishers get authors and readers together. They typically make their money by charging the reader and giving some fraction of the earnings to the author as royalties.

This 20th century model of publishing doesn't serve authors of academic books well. Often, publishers set the price of academic books relatively high, expecting to earn the greatest profits from libraries and a handful of aficionados. For most books that aren't aimed towards a popular audience, including most academic books, royalties are quite small. Optimistically, I might have been able to buy a pretty good new bicycle if I had published these essays in the traditional fashion, but I'd rather have more people read my work than collect the chump change from royalties.

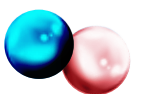
Therefore, the two-sided publishing model fails in two ways: the author doesn't make much money, and the author doesn't get read by very many people. Moreover, most publishers in my experience are still using 20th century technology to produce and distribute books. It can take many months—if not years—from a book's conception to its appearance in a reader's hands.

The irony is apparent that, in order to bring my work into the 21st century, I have decided to publish my collection of essays about two-sided markets in a one-sided way. I ditched the intermediary and chose to connect directly with likely readers. I'm sure some of you would prefer the feel of paper and leather but hopefully the price is right. It was easy for me to decide to make this volume free because it cost almost nothing to produce and distribute it.

This version of the book consists of a series of urls (website addresses) that will take you to the original papers. It is easy to download and store them as pdfs on your iPad or whatever e-reader you use, as well as on your personal computer. For those who find multiple downloading inconvenient, just wait: I am planning to release a downloadable pdf of the entire volume in the early part of 2011. It will have all of the chapters available in a single download.

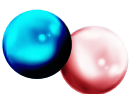
This approach is novel, and no doubt imperfect, but I'd like to make it better next time. Please feel free to post your comments on the LinkedIn group that I've created (Two-Sided Market Economics, Strategy, and Law) or email me directly at david.evans@competitionpolicyinternational.com with your suggestions.

- David S. Evans



Acknowledgements

I would like to thank Richard Schmalensee for his collaboration on several of the articles and books on multi-sided platforms we have done over the last decade as well as Jean-Charles Rochet and Jean Tirole who have been generous with their comments and time. None of them necessarily agrees with anything I say of course. I also want to extend my appreciation to Justin Unger who led the effort to design and assemble this book.

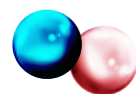


Introduction

This volume collects a series of essays that I have written, sometimes with colleagues, over the last decade on businesses that create value by providing products that enable two or more different types of customers to get together, find each other, and exchange value. These businesses were called “two-sided markets” in the seminal paper by Jean-Charles Rochet and Jean Tirole that was first circulated in 2001.¹ I typically avoid this term since it tends to obscure the fact that we are talking about businesses rather than markets. I prefer the term “multi-sided platforms” because these businesses provide a place for customers to meet and interact and often support more than two interdependent types of customers. In writing for business audiences I use the term “catalyst” to denote the fact that these businesses create value that couldn’t be had without bringing these customer types together.² The term “two-sided markets” has stuck, though, and I will use it here.

The Rochet and Tirole paper ignited work on two-sided markets in economics, law, and business. Several other papers, in circulation around 2000, touched on some of the interesting aspects of intermediaries³ or on the increasingly widespread phenomenon of giving one product away for free to attract revenue from another product.⁴ The Toulousians’ contribution was fundamental because it recognized for the first time that a very diverse set of businesses were two-sided, presented an elegant economic model of them, and derived several robust aspects of these businesses including the critical importance of the price structure (the relative prices charged to the various types of customers) in their making money.

Economic theorists and empiricists were quickly attracted to this topic. The mill of articles and dissertations has flourished ever since.⁵ It soon became apparent that this new area had important implications for antitrust. Many competition authorities took notice and law review articles addressed various aspects of these newly-recognized business forms.⁶ The corporate world seized on this new field. Strategy articles and courses focused on these platforms began appearing.⁷ Companies found the subject eye opening, including firms that were multi-sided platforms but had not quite understood the ramifications.⁸

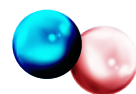


Introduction

My modest contributions to this literature are presented in this volume. Part I presents background pieces on the economics of multi-sided platforms and industries in which these platforms are common. Part II examines the antitrust economics of two-sided markets including the difficult problem of defining the boundaries of competition. Part III comprises several papers that apply two-sided market analysis to web-based businesses. Part IV does the same for payment cards which is the industry that attracted much of the early two-sided analysis—in part because this framework was helpful for understanding the hotly debated issue of interchange fees. Part V collects several article and book chapters on software platforms. These platforms have become especially important in the last several years because they are now the basis for revolutionary developments with mobile devices (e.g. the iPhone and Android), social networking (Facebook in particular), and payments (PayPalX). The essays are published as originally written (usually, in fact, whatever version I could make freely available).

When the theory of two-sided markets was first introduced it was common to hear at least two complaints. The first was that there was nothing new—from economists who suggested that it was just the indirect network effects wine in new bottles or antitrust analysts who commented that it had all been considered before in advertising cases. The second was that it was a theory of everything, and therefore nothing, since everything seems to be two-sided.

There's some truth of course to both comments. Indirect network effects are usually essential to understanding two-sided markets. But the network effects literature among other things missed the importance of these effects for a very diverse group of industries; the literature spent a lot of time on fax machines and video standards but not so much on more general business issues such as pricing or industries such as shopping malls that did not obviously have indirect network effects. One of the problems with two-sided market analysis is that it is hard to find formal limiting principles, but that isn't uncommon in economics. Sometimes a two-sided market perspective is highly informative while other times it isn't. It matters when it matters. What's now very clear, with the benefit of a decade of work, is that the study of multi-sided platforms has provided valuable insights to economists, policymakers and business people. I hope the chapters below account for a sliver of those.



Introduction

¹ Jean-Charles Rochet and Jean Tirole, "Platform Competition in Two-Sided Markets," *Journal of the European Economic Association* 1, no. 4 (2003): 990-1209.

² David S. Evans and Richard Schmalensee, *Catalyst Code: The Strategies behind the World's Most Dynamic Companies* (Cambridge, MA: Harvard Business School Press, 2007).

³ Bernard Caillaud and Bruno Jullien, "Chicken & Egg: Competition among Intermediation Service Providers," *RAND Journal of Economics*, The RAND Corporation, vol. 34(2), pages 309-28, Summer.

⁴ Geoffrey Parker and Marshall Van Alstyne (2005). "Two-Sided Network Effects: A Theory of Information Product Design." *Management Science*, Vol. 51, No. 10.

⁵ With the recent important work of Glen Weyl we have moved on to Two-Sided Markets 2.0. See Glen Weyl, "A Price Theory of Multi-Sided Platforms," *American Economic Review*, 2010, 100(4).

⁶ OECD Organization for Economic Co-operation and Development ("OECD"), *Two-Sided Markets*, DAF/COMP (2009) 20, 28.

⁷ See, for example, Thomas Eisenmann "Managing Networked Businesses: Course Overview." *Harvard Business Online*, 2006; Thomas Eisenmann, Geoffrey Parker, and Marshall Van Alstyne, "Strategies for Two-Sided Markets." *Harvard Business Review*, 2006.

⁸ Companies in the payment card industry, for example, have fundamentally changed how they think about that business as a result of the two-sided market concepts.

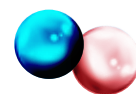


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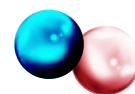
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About The Author

ESSAYS on the Economics

OF TWO-SIDED MARKETS



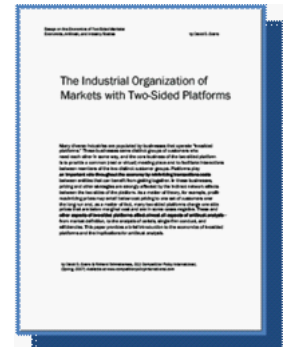
Part One **ECONOMICS OF MULTI-SIDED PLATFORM BUSINESSES**

CHAPTER ONE

Industrial Organization of Two-Sided Platforms

Abstract:

Many diverse industries are populated by businesses that operate two-sided platforms. These businesses serve distinct groups of customers who need each other in some way, and the core business of the two-sided platform is to provide a common (real or virtual) meeting place and to facilitate interactions between members of the two distinct customer groups. Platforms play an important role throughout the economy by minimizing transactions costs between entities that can benefit from getting together. In these businesses, pricing and other strategies are strongly affected by the indirect network effects between the two sides of the platform. As a matter of theory, for example, profit-maximizing prices may entail below-cost pricing to one set of customers over the long run and, as a matter of fact, many two-sided platforms charge one side prices that are below marginal cost and are in some cases negative. These and other aspects of two-sided platforms affect almost all aspects of antitrust analysis - from market definition, to the analysis of cartels, single-firm conduct, and efficiencies. This paper provides a brief introduction to the economics of two-sided platforms and the implications for antitrust analysis.

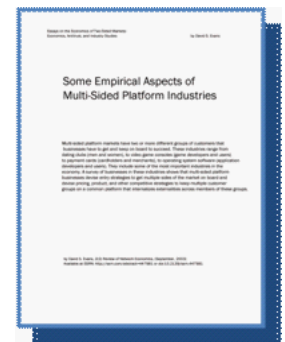


CHAPTER TWO

Some Empirical Aspects of Multi-Sided Platform Industries

Abstract:

Multi-sided platform markets have two or more different groups of customers that businesses have to get and keep on board to succeed. These industries range from dating clubs (men and women), to video game consoles (game developers and users), to payment cards (cardholders and merchants), to operating system software (application developers and users). They include some of the most important industries in the economy. A survey of businesses in these industries shows that multi-sided platform businesses devise entry strategies to get multiple sides of the market on board and devise pricing, product, and other competitive strategies to keep multiple customer groups on a common platform that internalizes externalities across members of these groups.

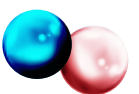


CHAPTER THREE

How Catalysts Ignite: The Economics of Platform-Based Startups

Abstract:

Entrepreneurs who start multi-sided platforms must secure enough customers on both sides, and in the right proportions, to provide enough value to either group of customers and to achieve sustainable growth. In particular, these entrepreneurs must secure "critical mass" to ignite the growth of their platforms; the failure to achieve "critical mass" quickly results in the implosion of the platform. There are a number of strategies available to entrepreneurs to reach critical mass. For example, the "zig-zag" strategy involves successive accretions of customers on both sides to build up the value to both. The relevant strategies depend in large part on whether the nature of the platform requires securing participation by both platform sides at launch (e.g. dating venues), whether it is possible to acquire one side before approaching the other side (e.g. search engines), and whether it is necessary to make pre-commitments to one side to induce them to make investments (e.g. video games).



CHAPTER FOUR

Antitrust Economics of Multi-Sided Platforms

Abstract:

"Two-sided" markets have two different groups of customers that businesses have to get on board to succeed - there is a "chicken-and-egg" problem that needs to be solved. These industries range from dating clubs (men and women), to video game consoles (game developers and users), to credit cards (cardholders and merchants), and to operating system software (application developers and users). They include some of the most important industries in the economy.

Two-sided firms behave in ways that seem surprising from the vantage point of traditional industries, but in ways that seem like plain common sense once one understands the business problems they must solve. Prices do not and prices cannot follow marginal costs in each side of the market. Price levels, price structures, and investment strategies must optimize output by harvesting the indirect network effects available on both sides. By doing so, businesses in two-sided industries get both sides on board and solve the chicken-and-egg problem. There is no basis for asking regulators or antitrust enforcers to steer clear of these industries or to spend extra effort on them. The antitrust analysis of these industries, however should heed the economic principles that govern pricing and investment decisions in these industries.

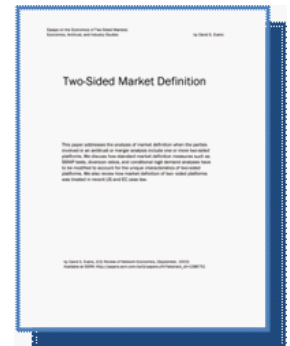


CHAPTER FIVE

Two-Sided Market Definition

Abstract:

This paper addresses the analysis of market definition when the parties involved in an antitrust or merger analysis include one or more two-sided platforms. We discuss how standard market definition measures such as SSNIP tests, diversion ratios, and conditional logit demand analyses have to be modified to account for the unique characteristics of two-sided platforms. We also review how market definition of two-sided platforms was treated in recent US and EC case law.

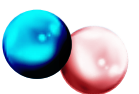
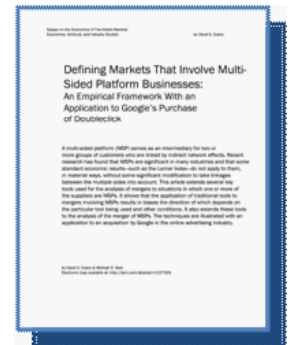


CHAPTER SIX

Defining Markets that Involve Two-Sided Platforms

Abstract:

A multi-sided platform (MSP) serves as an intermediary for two or more groups of customers who are linked by indirect network effects. Recent research has found that MSPs are significant in many industries and that some standard economic results - such as the Lerner Index - do not apply to them, in material ways, without some significant modification to take linkages between the multiple sides into account. This article extends several key tools used for the analysis of mergers to situations in which one or more of the suppliers are MSPs. It shows that the application of traditional tools to mergers involving MSPs results in biases the direction of which depends on the particular tool being used and other conditions. It also extends these tools to the analysis of the merger of MSPs. The techniques are illustrated with an application to an acquisition by Google in the online advertising industry.



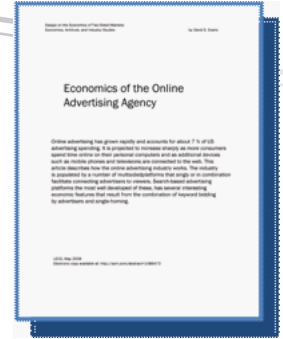
Part Three WEB BASED PLATFORMS

CHAPTER SEVEN

Economics of the Online Advertising Industry

Abstract:

Online advertising has grown rapidly and accounts for about 7% of US advertising spending. It is projected to increase sharply as more consumers spend time online on their personal computers and as additional devices such as mobile phones and televisions are connected to the web. This article describes how the online advertising industry works. The industry is populated by a number of multisided platforms that singly or in combination facilitate connecting advertisers to viewers. Search-based advertising platforms, the most well developed of these, has several interesting economic features that result from the combination of keyword bidding by advertisers and single-homing.



CHAPTER EIGHT

The Online Advertising Industry: Economics, Evolution, and Privacy

Abstract:

Online advertising accounts for almost 9 percent of all advertising in the United States. This share is expected to increase as more media is consumed over the internet and as more advertisers shift spending to online technologies. The expansion of internet-based advertising is transforming the advertising business by providing more efficient methods of matching advertisers and consumers and is transforming the media business by providing a source of revenue for online media firms that compete with traditional media firms. The precipitous decline of the newspaper industry is one manifestation of the symbiotic relationship between online content and online advertising. Online-advertising is provided by a series of interlocking multi-sided platforms (also known as two-sided markets) that facilitate the matching of advertisers and consumers. These intermediaries increasingly make use of detailed individual data, predictive methods, and matching algorithms to create more efficient matches between consumers and advertisers. Some of their methods raise public policy issues that require balancing providing consumers more valuable advertising against the possible loss of valuable privacy.



CHAPTER NINE

Web Economy, Two-Sided Markets, and Competition Policy

Abstract:

The web economy has grown rapidly in the last decade. Online businesses have several key features that are important for understanding the pro-competitive and anti-competitive strategies they may engage in. The two-sided markets literature helps elucidate many of these strategies. It also provides guidance for the antitrust analysis of market definition and exclusionary practices for web-based businesses.

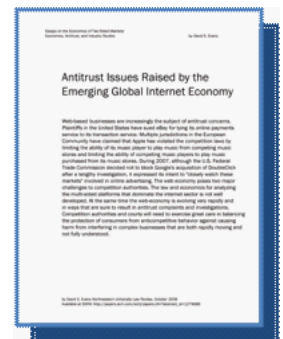


CHAPTER TEN

Antitrust Issues Raised by the Emerging Global Internet Economy

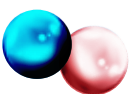
Abstract:

Web-based businesses are increasingly the subject of antitrust concerns. Plaintiffs in the United States have sued eBay for tying its online payments service to its transaction service. Multiple jurisdictions in the European Community have claimed that Apple has violated the competition laws by limiting the ability of its music player to play music from competing music stores and limiting the ability of competing music players to play music purchased from its music stores. During 2007, although the U.S. Federal Trade Commission decided not to block Google's acquisition of DoubleClick after a lengthy investigation, it expressed its intent to "closely watch these markets" involved in online advertising. The web economy poses two major challenges to competition authorities. The law and economics for analyzing the multi-sided platforms that dominate the internet sector is not well developed. At the same time the web-economy is evolving very rapidly and in ways that are sure to result in antitrust complaints and investigations. Competition authorities and courts will need to exercise great care in balancing the protection of consumers from anticompetitive behavior against causing harm from interfering in complex businesses that are both rapidly moving and not fully understood.



ESSAYS on the Economics

OF TWO-SIDED MARKETS



CHAPTER ELEVEN

More Than Money

Abstract:

The simple payment card has been around since at least the beginning of the twentieth century. Hotels, oil companies, and department stores issued cards before World War I. In response to customer requests, Sears began offering lines of credit in 1910 to customers of “unquestionable responsibility,” although the Sears card came more than a decade later. Some large retailers gave cards to their wealthier customers that identified them as having a charge account with the store. By the 1920s, several department stores allowed cardholders to pay off their bills in monthly installments. Metal “charge-plates” with embossed consumer information were introduced by department stores in 1928. During the 1920s as well, oil companies issued “courtesy cards” for charging gas. By the end of World War II, charge cards were no longer a novelty, but they were about as far from the cards of today as barter was from coin.

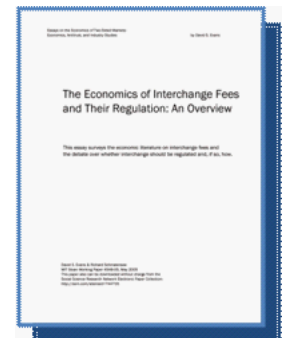


CHAPTER TWELVE

Interchange Fees and Their Regulation

Abstract:

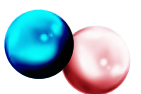
This essay surveys the economic literature on interchange fees and the debate over whether interchange should be regulated and, if so, how. We consider, first, the operation of unitary payment systems, like American Express, in the context of the recent economic literature on two-sided markets, in which businesses cater to two interdependent groups of customers. The main focus is on the determination of price structure. We then discuss the basic economics of multi-party payment systems and the role of interchange in the operation of such systems under some standard, though unrealistic, simplifying assumptions. The key point of this discussion is that the interchange fee is not an ordinary price; its most direct effect is on price structure, not price level.



We then examine the implications for privately determined interchange fees of some of the relevant market imperfections that have been discussed in the economic literature. While some studies suggest that privately determined interchange fees are inefficiently high, others point to fees being inefficiently low. Moreover, there is a consensus among economists that, as a matter of theory, it is not possible to arrive, except by happenstance, at the socially optimal interchange fee through any regulatory system that considers only costs. This distinguishes the market imperfections at issue here for multi-party systems from the more familiar area of public utility regulation, where setting price equal to marginal cost is theoretically ideal.

Next, we consider the issues facing policy makers. Since there is so much uncertainty about the relation between privately and socially optimal interchange fees, the outcome of a policy debate can depend critically on who bears the burden of proof under whatever set of institutions and laws the deliberation takes place. There is no apparent basis in today's economics - at a theoretical or empirical level - for concluding that it is generally possible to improve social welfare by a noticeable reduction in privately set interchange fees. Thus, if antitrust or other regulators had to show that such intervention would improve welfare, they could not do so. This, again, is quite unlike public utility regulation or many areas of antitrust including, in particular, ordinary cartels. By the same token, there is no basis in economics for concluding that the privately set interchange fee is just right. Thus, if card associations had to bear the burden of proof - for example, to obtain a comfort or clearance letter from authorities for engaging in presumptively illegal coordinated behavior - it would be difficult for them to demonstrate that they set socially optimal fees.

We take a pragmatic approach by suggesting two fact-based inquiries that we believe policymakers should undertake before intervening to affect interchange. First, policymakers should establish that there is a significant market failure that needs to be addressed. Second, policymakers should establish that it is possible to correct a serious market imperfection, assuming one exists, by whatever intervention they are considering (such as cost-based regulation of interchange fee levels) and thereby to increase social welfare significantly after taking into account other distortions that the intervention may create. We illustrate both of these points by examining the recent Australian experience.

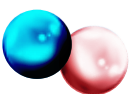


CHAPTER THIRTEEN

The Effect of Regulatory Intervention in Two-Sided Markets: An Assessment of Interchange-Fee Capping in Australia

Abstract:

The Reserve Bank of Australia reduced interchange fees by almost half thereby eliminating a significant source of revenue to issuers of credit cards. The purpose of this intervention was to align the prices of using various payment instruments with their social costs and thus reduce the use of cards, which the RBA viewed as a socially less efficient payment method than cash, checks, and PIN debit cards. The short-run result of this regulatory intervention has been the following: (1) Bank issuers have increased the fixed prices for cards and thereby recovered between 30 and 40 percent of the loss of interchange fee revenue; this fraction is likely to increase over time as cards renew and new solicitations go out. Bank issuers have not changed the per-transaction fees for cards much. (2) Merchants experienced a very small reduction in their costs. Both theory and limited empirical evidence suggest that the highly concentrated merchant sector in Australia has captured the reduction in interchange fees as profits and has not passed it on in the form of lower consumer prices. (3) The per-transaction price at the point of sale has not changed significantly. Merchants have not generally availed themselves of their right to surcharge card transactions and the per-transaction price faced by consumers from their card issuers has not changed much. Holding the number of cards fixed, the regulatory intervention has not altered prices in a way that could achieve the intent of the intervention. (4) There is relatively little evidence thus far that the intervention has in fact affected the volume of card transactions in Australia as intended by the regulation. (5) In the short-run, the effect of the regulation has been to transfer significant profits to the Australian merchant sector with that transfer being borne partly by bank issuers and partly by cardholders. (6) Since proprietary systems such as American Express were not subject to the pricing regulations and since American Express can enter into deals with banks to issue cards, banks have shifted volume from the regulated association systems to the unregulated proprietary systems.



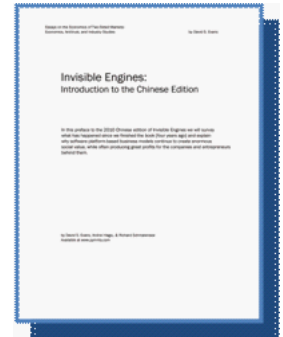
CHAPTER FOURTEEN

Invisible Engines: Introduction to the Chinese Edition

Abstract:

The use of software platforms to drive innovation and transform industries has exploded in the four years since the publication of the English-language edition of Invisible Engines in 2006. Around the globe, invisible engines are ushering in a new era of software-based technological change. The Apple iPhone has shaken the mobile phone industry worldwide in part by creating a massive applications business built on the phone's operating system. Firefox has revolutionized the browser industry by encouraging web developers to write add-ons and in doing so toppled Microsoft's Internet Explorer from dominance in many countries. Facebook has created a powerful social networking platform by opening itself up to developers. Amazon has released a cloud-computing platform that enables entrepreneurs to access its vast software, hardware and global communication systems over the Internet. A less well known company, IPCommerce, is starting to transform the payments business in the United States by helping developers build applications that work with the diverse hardware and software than handle the various types of payments.

In this preface to the 2010 Chinese edition of Invisible Engines we will survey what has happened since we finished the book and explain why software platform-based business models continue to create enormous social value, while often producing great profits for the companies and entrepreneurs behind them.

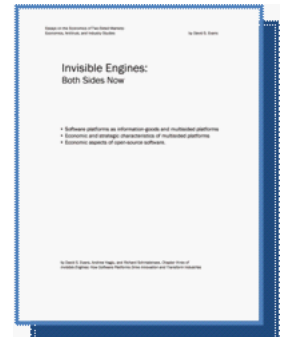


CHAPTER FIFTEEN

Invisible Engines: Both Sides Now

Abstract:

Two features of the technology we described in the last chapter shape the economics of software platforms. Software platforms are a written product of the mind. They are in effect documents, usually written in a high-level computer language. The code involved is malleable. It can be moved, altered, added to, and sub-tracted from with great ease. It is created almost entirely by people—“almost” because, like composers and writers, most programmers use computers for help. Software platforms are inherently multisided. They usually serve distinct groups of customers, who benefit from having each other on the same platform. Application Programming Interfaces (APIs) forge the crucial relationship between application developers and end users.

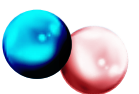


CHAPTER SIXTEEN

What's Next in Payments: Invisible Engines

Abstract:

Invisible engines drive innovation and transform industries. They made personal computers indispensable, glued boys and men to their video game consoles, and turned the mobile phone into a device that may be able to do just about anything except wash the dishes. And they are about to revolutionize payments — accelerating the pace of innovation, providing new services for consumers and merchants, and making new sources of profits available. I want to tell you what these magical invisible engines are, and why they are going to transform the payments industry.



David S. Evans specializes in the application of economics to competition policy. He is the founder of Competition Policy International which provides comprehensive resources and continuing education for the global antitrust community.

David has served as an expert on antitrust and merger matters in the United States and the European Union, has testified before the US and EU courts, and has presented before US and EU competition authorities on merger and antitrust matters. He has advised many law firms and corporations in many jurisdictions around the world on matters involving antitrust economics. He has also served as a senior economic advisor on competition policy matters to the general counsel of several multinational corporations.

David has written more than 100 articles and seven books, primarily on industrial organization and antitrust economics. Much of his recent work has concerned the economics of two-sided markets and the internet economy. His book, *Invisible Engines: How Software Platforms Drive Innovation and Transform Industries*, won the American Publishers Association best book award in the 2006 professional/scholarly book competition.

David holds teaching positions at the law schools of the University of Chicago and the University College London and was previously a professor at Fordham University Law School. He earned his Ph.D. as well as undergraduate degrees in economics from the University of Chicago.

[Click here to contact David Evans](#)

