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Abstract   Economists at the Federal Trade Commission pursue the agency's competition and consumer protection missions. In this year's essay, with respect to antitrust we discuss the analysis that is used in two areas where the Commission has recently been active: physician combinations and standard essential patents (SEPs). In consumer protection, we discuss the FTC's recently released national study of the accuracy of consumer credit reports.

generic entrants), and competition policy efforts (e.g., developing a policy for evaluating

Accountable Care Organizations). In addition, approximately 22 economists work full-time on

consumer protection investigations and related policy and research.

During fiscal year 2012, U.S. merger and acquisition (M&A) activity held steady, with

1,429 transactions that were reported to the DOJ and FTC, as compared to 1,450 in fiscal year

2011. M&A activity is highly cyclical: Over the past decade, these figures have ranged between

716 (in 2009) and 2,201 (in 2007). The vast majority of proposed mergers are cleared within the

"waiting period" that is imposed by the HSR Act (usually 30 days; 15 for cash-tender offers or

bankruptcy sales). During FY 2012, the FTC opened 20 formal merger investigations, and

brought a total of 25 merger enforcement actions (some of which were initiated in preceding

years). Fifteen of these actions involved consent orders (permitting the transaction to proceed,

albeit with modifications), seven transactions were abandoned or restructured during (and

perhaps as a result of) the investigations, and three prompted administrative litigation (OSF

Healthcare System/Rockford Health System, Graco/Illinois Tool Works, and

Omnicare/Pharmerica).[1]

The Bureau of Economics also undertakes significant research activities throughout the

year. Many of our economists perform academic research alongside their professional duties, and

we also sponsor and disseminate competition-related research through seminars and conferences.

[1] FTC & DOJ Hart-Scott-Rodino Annual Report, Fiscal Year 2012. Retrieved from
http://www.ftc.gov/os/2013/04/130430hsrreport.pdf

In November 2012, we hosted our 5th annual Microeconomics Conference. Topics included the economics of privacy, the effects of Internet-based advertising on search and product quality, and structural models of firm entry and conduct. We also have an active seminar series featuring academic and government researchers.

Each year, we use the forum that is provided by the   's antitrust and regulation issue to share some of our work with an academic audience. This year, we highlight an empirical method for evalua

contribution to consumers' willingness-to-pay (WTP) for the network. If two parties to a merger are substitutes (i.e., have non-zero diversion ratios), then the willingness-to-pay for the merged entity will exceed the sum of the willingness-to-pay for the individual parties so long as there are no perfect substitutes to the merged entity in the market. Such an increase in WTP raises the providers' leverage in a negotiation and can increase the negotiated in-network price.

Determining whether providers are substitutes requires appropriate data and a model of consumer behavior. A recent strain of the economic literature has developed discrete choice models of patients' choices of hospitals. These models can be used to estimate diversion ratios and the change in the WTP resulting from a particular provider combination. We now discuss how these models are specified and what modifications are needed to adapt them to the physician setting.

2.2   Estimating Patient Choice for Physician Services

To evaluate the possible effects of a provider combination, we require a model of how patients select providers. In the hospital setting, we estimate discrete choice models using patient-level discharge data. These data include very detailed information about both the hospital and the patient. For example, discharge records frequently include the age, gender, 5-digit zip code of the patient's residence, and an indicator of the health of the patient.[3] Providers are identified by name and address, and these identifying characteristics can be used to match with additional data

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[3] Hospital data frequently includes the Diagnosis Related Group (DRG) code that is used for Medicare billing purposes, and physician claims data frequently includes an array of condition codes that are identified using the International Classification of Disease Code version 9 (ICD-9).

about the hospitals from other sources: e.g., services offered, number of beds, hospital ownership status.

Whereas most states gather hospital discharge data directly from hospitals (as opposed to gathering these data from insurers) and make these data available to researchers, data on office-based services is much more difficult to obtain. The FTC has acquired such data for investigational purposes in a number of settings, including specialty surgical centers, outpatient kidney dialysis centers, and physician services. Like the public hospital discharge databases, these data are provided at the patient-encounter level and include a substantial amount of patient detail, along with a provider identifier that can often be matched to public information on providers. Unlike the public hospital discharge databases, payer claims data include the privately-negotiated transaction price for each encounter, which is known as the "allowed amount."

In office-based provider cases, the FTC acquires insurer claims data for provider services at the episodic level (i.e., a visit for office-based care, or a discharge for inpatient care). Typically, we request data from all of the significant insurers in the geographic area of interest, with the objective of assembling

hundred physicians. A further contribution to the data challenges that are associated with estimating a discrete choice model in the physician setting is the fact that many physicians perform services at multiple locations, and each physician-location combination is best considered a unique provider choice given the well-documented role of provider location in determining provider choice.

The approach that we describe below enables us to produce the key outputs that we desire from the patient choice model – i.e., willingness-to-pay estimates (in "utils") and diversion ratios – without estimating the underlying parameters of the utility function.[6]

2.3 An Application to Physician Mergers

To apply the methodology described in Farrell et al. (2011) to the physician market, we assume that patients can be partitioned into mutually-exclusive and collectively-exhaustive microsegments, which are denoted   . That is, each patient   is a member of a single microsegment   An alternative interpretation is that all patients in microsegment   share identical values of relevant patient characteristics. The total number of patients in microsegment   is represented by   . We use the term "microshare" to refer to each provider's share of patients in each microsegment. Our model allows the utility that is generated by each provider   to vary by microsegment.

Let   be a   x1 vector of 0s with a 1 in the   th row, and let   be a   x1 vector of parameters, where the   th row gives the mean utility of selecting provider   . For a given

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patient , we refer to the patient's segment as   ( ) . Because all patients in segment   share

the same characteristics, we can rewrite the utility generated by choice   in terms of   . For

a patient   , equation (1) can be rewritten as

(2)

Next, we show how the parameter estimates that are obtained from estimating equation

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which illustrates that the log likelihood can be maximized independently for each segment .

Therefore, for simplicity we consider the optimization problem for just one segment .

The predicted probability that patients in microsegment select provider , conditional upon

parameter estimates , can be written as

$$(4) \qquad\qquad\qquad ( ) \quad \frac{\exp(\;)}{\exp(\quad)}.$$

Define ( ) as the vector of provider shares such that row consists of ( ). The first-order

condition to maximize equation (3') with respect to is

Since WTP sums across each patient in a market, the aggregation is weighted by the observed

number of visits in the segment,   .

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these providers. To address this issue, we have generally explored the relationship between WTP and price for larger providers, such as hospitals, because large providers are more likely to engage in individualized bargaining.[9]

Although our discussion above has focused on physician markets, we continue to refine our understanding and application of WTP bargaining methodology more generally. This includes developing approaches that better incorporate health plans' recent attempts to utilize nuanced patient-steering mechanisms, such as plan designs that include significant co-insurance, high deductibles, and/or tiered co-payment structures.

3. Economic Analysis of Standard Essential Patents

Standard setting involves cooperation among firms to select a common technology for a given product feature. Standards are prevalent in settings with significant network externalities, such as

Once a standard has been adopted and widely implemented in an industry, there is an incentive for a SEP-holder to exploit the market power that has been conferred not by the patent's intrinsic   value, but by the   value that reflects the patent's essentiality to the standard. To guard against this "patent hold-up," many standard-setting organizations require firms to agree to license SEPs on fair, reasonable and non-discriminatory (FRAND) terms. Indeed, standard-setting organizations have traditionally faced only limited antitrust scrutiny owing to such pledges, which (if fulfilled) enable consumers to reap the benefits of standards. When firms do not honor commitments to license on FRAND terms, the selected standard may be ex-post suboptimal, network externalities may be abridged because of slower adoption and follow-on innovation, and final goods prices may be higher. Such behavior has attracted the attention of the FTC and the DOJ.

Parties may be unable to agree on FRAND rates and licensing terms. When this occurs, some SEP holders have asked a district court to issue an injunction, or the International Trade Commission (ITC) to issue an exclusion order, for infringement of the FRAND-encumbered SEPs.[10] The FTC has taken a particular interest in cases where an injunction or exclusion order is sought for infringement of a FRAND-encumbered SEP. In this section, we review the FTC's recent activity relating to SEPs and describe the economic framework underlying our thinking about SEPs. We tailor Shapiro's (2010) model of royalty negotiations for non-essential patents under the threat of injunctions to reflect the economic characteristics of SEPs.

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[10] The Supreme Court's 2006   decision, which eliminated the presumption of injunctive relief for patent cases, has made it more difficult for patent holders to obtain injunctions in federal courts:

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standards that were under development by these organizations, and agreed to license its SEPs on FRAND terms. Motorola Mobility later sought injunctions and exclusion orders on its SEPs against several implementers of the standards, including Apple, Microsoft, and RIM. Google continued the lawsuits after its acquisition of Motorola Mobility in 2012. Per the Commission's Final Order, Google may not obtain or enforce an injunction or exclusion order from a current proceeding. In addition, henceforth Google must make arbitration offers and allow potential licensees to seek a FRAND determination in federal court prior to seeking injunctions or exclusion orders from the ITC.

The Commission has also been engaged in advocacy relating to SEPs. In particular, the Commission filed public interest letters with the ITC in two cases where Motorola Mobility has sought exclusion orders against Apple and Microsoft for infringing Motorola Mobility's SEPs.[14] In those letters the Commission argued that seeking an exclusion order with respect to SEPs that are covered by a FRAND commitment may result in patent hold-up and deter innovation. The Commission made similar arguments in an amicus brief in the private litigation between Motorola Mobility and Apple in the C

In this section, we examine how the threat of an injunction affects the bargaining dynamic between a patentee and a potential licensee of a SEP. We begin by outlining the benchmark model that is presented in Shapiro (2010), which he uses to illustrate hold-up in the context of non-essential patents. We show that a SEP is a special case of this model, and solve for the equilibrium royalty rate for a SEP. Given that the key distinction between a non-essential and an essential patent is that product redesign is possible (if costly) in the former case, it follows that the hold-up problem is exacerbated for SEPs.

In Shapiro's setup, there is a downstream firm (D) that has already developed a product that incorporates a patented innovation (held by P, the patentee). The product can be sold at a margin   and unit sales are represented by   The innovation creates value   : i.e., if the product did not incorporate the patented innovation, it would generate margins of   The parties engage in Nash bargaining over a royalty rate   with D's bargaining parameter represented by

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weighted by its bargaining power. The first term represents the surplus to P from an agreement. If the parties agree to royalty then P earns rX. If not, then P sues D, incurs litigation costs CP, and with probability is awarded damages of sT and earns a royalty rate r' for all post-injunction sales. The second term illustrates D's payoff from agreement, which is (m-r)X, less its payoff from the alternative in which it is sued. Note that with probability 1 – , the patent is found invalid or not infringed, and D pays nothing to the patentee.

The resulting royalty and firm payoffs for the entire game, assuming the court sets at the benchmark royalty are

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$$\frac{*}{\underline{}} \quad \frac{}{} \; 1 \qquad . \tag{15}$$

This ratio reveals two insights. First, as Shapiro observes (in deriving such a ratio for the case with finite redesign costs), patent hold-up is larger the   is the contribution of the patented innovation to the overall value that is created by the downstream product. The reason is that the

report (FTC, 2012) to Congress that described the results of its national study of consumer credit reporting accuracy. A final report is due in December 2014.

4.1 Background

The U.S. credit reporting industry consists primarily of three national CRAs that maintain a wide range of information on approximately 200 million consumers.[17] Creditors and others voluntarily submit information to these repositories of information, which then consolidate the data into credit reports. Users of credit reports analyze the data and other information to assess the risk

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could cause the consumer to pay a higher (or lower) price. At the market level, the accuracy of

credit ratings affects lenders' ability to estimate default risk and to tailor interest rates and credit

terms to the risks that are presented by individual borrowers.

Prior studies of credit report accuracy essentially fall into three categories: consumer

surveys; studies that are based on dispute statistics (i.e., data that are related to instances in

As the set of participants developed, VantageScores of the participant sample to date were analyzed and compared to the distribution of VantageScores in the sampling frame. The sampling was sequentially adjusted so that the ultimate sample of approximately 1,000 participants is representative in credit scores.[23]

In spite of the close match between the sample and population distributions of credit scores, the sample subjects may not be representative of consumers with credit reports in other dimensions. Participation in the study was voluntary and required a moderate time commitment, as well as disclosure of personal data. Various credit and non-credit data on non-respondents were collected to evaluate this concern. Upon comparing participants and non-participants on multiple dimensions, we found participants to be similar to non-participants in the majority of factors that might impact credit scores. To the extent that significant differences are present, we expect the potential biases to be modest.

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the study process ended for that participant. For the consumers who did identify a potentially material error, the study associate noted the exact nature of the error and how the information should appear if corrected. At the end of the phone interview, all consumers completed an exit survey to collect basic information about the consumer's demographic, household, and financial characteristics.

If a consumer identified an e

associate determined whether the dispute process had resulted in changes to the credit report.[27]

Upon reviewing the new credit report, there were three possibilities: (1) no changes were made to the credit report; (2) all requested changes were made to the credit report; or (3) only some of the requested changes were made to the credit report. If all requested changes or no requested changes were made, the relevant FICO score already existed for the credit report. For those reports that only had some of the requested changes imposed, a second rescoring was necessary.[28]

4.3 Results

We present measures of credit report accuracy at both the   level and the   level. Because each participant drew thre

one of their three possible reports, then there would be two out of 30 reports with errors and a report level error rate of 6.7%.

Table 1 provides the error rates at both the   and   level. There are 1,001 participants who completed an interview with the contractor.[29] Of these participants, 263 identified alleged errors that were potentially material (using the criteria established above) on at least one credit report. From this set of cases with potentially material errors, one participant confirmed that he/she had chosen not to file a dispute, 262 confirmed that they intended to file a dispute, and the contractor received confirmation from 239 participants that disputes were filed.[30] Thus, the maximum potential error rate for consumers if all identified potentially material errors were confirmed as legitimate would be 263/1,001 = 26.3% of participants.

[TABLE 1 HERE]

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[29] A total of 1,003 interviews were completed, but two participants provided information that was deemed unreliable and thus were dropped from the analysis.

[30] Although the contractor did not receive confirmation from 23 participants, it is still possible that these individuals filed disputes. The contractor made multiple attempts to

Table 2 shows that 3.2% of consumers who reviewed their credit report(s) with a study associate identified a potentially material error and had a maximum score increase (out of possibly three score changes) of 1-9 points, and another 3.1% of consumers had a maximum score change of 10-19 points.

[TABLE 2 HERE]

We also provide the credit score changes at the report level. Of the 399 reports that were modified in response to the consumer filing a dispute with a CRA, there are 211 reports where the FICO credit scores for that report changed.[32] Table 3 below presents the impact on credit report scores that resulted from the consumer disputes. The majority of disputes (361 out of 572, or 63%) did not result in a credit score change. Column 2 of Table 3 shows that, overall, 6.6% of all credit reports had an increase in score following the consumer dispute.[33] Conditional on disputing (572 credit reports), 34.1% experienced a score increase and 2.7% of the 572 disputed

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[32] Recall that the study's scoring process used the original file to isolate the change in score for a report due only to changes that were made in response to the consumer dispute (i.e., no new information is contained in the credit report other than the modifications made by the CRA in response to the dispute).

[33] There is no established rule or threshold for classifying the significance of a credit score change as minor or major, because the impact of a change in score is dependent on the current score. That is, a 25 point change in FICO score that keeps the consumer in a particular credit risk category may not have a large impact on the person's likelihood of receiving credit. On the other hand, a one-point change in credit score that moves a consumer from one risk tier to the next may have a large impact on the consumer's access to credit or on the products and rates that the consumer is able to secure.

reports experienced a score decrease.[34]

[TABLE 3 HERE]

4.4 Discussion

The FTC Accuracy study evaluated the accuracy of 1,001 voluntary study participants' credit

reports. We documented the outcomes of the 262 participants who challenged at least one credit

report item through the FCRA dispute resolution process. As a result of the dispute process, 206

individuals had at least one credit report altered, and 129 consumers experienced a credit score

change on at least one report. At the report level, 399 reports were modified, and 211 reports

experienced a change in credit score. The score decreased for 16 reports, and many of the 195

positive score changes were moderate; half of the 195 positive score changes were less than 15

points. However, for a small number of participants, credit score changes were large; 27

participants had at least one of their three credit scores increase by more than 50 points.

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continue to examine their credit reports regularly through the use of

https://www.annualcreditreport.com and follow the FCRA dispute process when inaccuracies are

identified.

5 Conclusion

The foregoing provides a window into the work of the FTC's Bureau of Economics. Our efforts

in the healthcare, intellectual property, and credit reporting sectors reflect our commitment to

apply, extend, and develop state-of-the-art economic analyses in pursuit of the FTC's mission.

Table 1 Data Summary

Category	Number	Percentage
Participants		
Number of with reliable data	1,001	--
who identified potentially material errors and had dispute letters prepared by UMSL	263*	26.3%
with potentially material disputes who confirmed mailing dispute letters	239	23.9%
with changes made to at least one credit report when report is redrawn after dispute letter mailed	206	20.6%
who had at least one credit score change in response to a dispute	129	12.9%
Reports		
Number of credit reviewed with study associate	2,968**	--
Total number of sent to CRAs (for both potentially material and non-material errors)	708	23.9%
Total number of prepared by study associates for potentially material errors	572	19.3%
with changes made when report is redrawn after dispute letter mailed	399	13.4%
with credit score change in response to dispute	211	7.1%
Percent of credit with no identified potentially material errors	--	81%
Percent of credit with no identified potentially material errors and no credit score change	--	87%

Notes: *One person had dispute letters prepared, but the individual decided not to dispute. Therefore, the maximum number of cases with disputes filed is 262.
**If every participant had initially drawn and reviewed three credit reports, the total number of reports reviewed would be 3,003. However, there were 31 participants where the study associate/consumer was unable to draw all three initial reports. Most of these were due to technical issues with one CRA, because at the time of the study the CRA had discontinued its standard service with FICO.

Table 2 Consumer Level Score Changes

Change	Percentage of Participants who had a Maximum Score Change of
25+ point decrease	0.0%
20-24 point decrease	0.0%
10-19 point decrease	0.1%
1-9 point decrease	0.8%
None	N/A
1-9 point increase	3.2%
10-19 point increase	3.1%
20-24 point increase	0.9%
25-49 point increase	2.1%
50-99 point increase	2.3%
100+ point increase	0.4%

Note: There are a total of 1,001 participants in the study. Consumers may have disputed with multiple bureaus, and multiple reports may have experienced changes in score (or no changes in score). While this table provides the percentage whose maximum score change is within the given ranges, these consumers may have had smaller score changes, or zero point score changes, on their other disputed reports. Note that 74% of participants did not find any material errors in their credit histories; hence these account for the majority of the 87.1% of participants with no score changes.

Table 3 Report Level Score Changes

		(1)	(2)	(3)
Change	**Reports**	**Percent of All Reports**	**Percent of Disputed Reports**	**Percent of Modified Reports**
25+ point decrease	0	0.0%	0.0%	0.0%
20-24 point decrease	0	0.0%	0.0%	0.0%
10-19 point decrease	2	0.1%	0.3%	0.5%
1-9 point decrease	14	0.5%	2.4%	3.5%
None	361	12.2%	63.1%	N/A
1-9 point increase	66	2.2%	11.5%	16.5%
10-19 point increase	55	1.9%	9.6%	13.8%
20-24 point increase	12	0.4%	2.1%	3.0%
25-49 point increase	30	1.0%	5.2%	7.5%
50-99 point increase	28	0.9%	4.9%	7.0%
100+ point increase	4	0.1%	0.7%	1.0%

Note: In addition to the 2,968 reports that were reviewed with the study associate (all reports), this table includes percentages that were calculated for the 572 reports with potentially material errors disputed, and percentages that were calculated for the 399 reports with modifications following the dispute process that were inferred to have at least one material error.

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