"A Primer on Foreclosure. Patrick Rey and Jean Tirole. Handbook of Industrial Organization (2007)"

A summarizing exposition
Alexandrina I. Scorbureanu
Universite de Cergy-Pontoise
March 13, 2008

1 What is foreclosure?

In general, market foreclosure represent market practices that reduce buyers access to a supplier (upstream foreclosure) and/or limit the supplier's access to a buyer (downstream foreclosure). Some of the tools used to achieve market foreclosure include:

1. a buyer that purchases a supplier or set up his own production unit so as to manufacture the intermediate good internally;

2. a supplier that signs exclusive-dealing with his buyers;

3. a manufacturer that makes his good incompatible to complementary goods sold by other manufacturers.

There are two major types of foreclosure: in the _rst type, one of the sectors (up- or downstream) is monopolized (in this case foreclosure practices include exclusive dealing and competition reduction). In the second, neither sector is monopolized (foreclosure increases monopolization of one of the sectors). In this chapter, authors consider two particular cases of the _rst-type foreclosure: vertical and horizontal integration.

As intended in this paper, foreclosure is a _rm's restriction of output in one market through the use of market power in another market. It refers to a dominant _rm's denial of proper access to an essential good that it produces, with the intent of extending monopoly power from that bottleneck segment of the market to an adjacent segment (a potentially competitive one). When the bottleneck good (for instance infrastructure, software, etc) is used as an input by a potentially competitive downstream industry, or when it is sold directly to customers (who use it together with other complementary goods). Foreclosure may be complete (refusal to deal, extravagant prices or technical complementary integration between goods) or partial. It also may be:

1. vertical - arises when a _rm controls an essential input for the potentially competitive industry; this _rm can alter competition by denying or limiting access to its input,

2. horizontal - when the bottleneck good is sold directly to the _nal consumer and the _rm bundles the potentially competitive good to the bottleneck one.

Reassuming, some instruments used by the forecloser are:

(a) Integration of the forecloser _rm to other _rms in the complementary segment,
(b) Refusing to cooperate to put competitors in disadvantage (economies of scope or scale in the same market),
(c) Granted exclusivity to a subset of _rms producing selected goods,
(d) Second-degree price discrimination (by loyalty programs to all or rebates based on the rate of growth of purchases) and third-degree price discrimination (charging di_erent cost-adjusted prices to different customers), as well as "mixed bundling" (conditional discounts on complementary goods).
A number of solutions have been considered, namely:
2
(a) structural policies such as divestitures and line of business restrictions (but with high transaction costs) that may allow the joint ownership by all competitors of an essential facility;
(b) access price control when antitrust authorities compare the price of access with some measure of its cost (di_cult to measure empirically marginal costs),
(c) access quantity control within an exclusivity contract, some amount of each operator's capacity must be allocated to new entrants,
(d) price linkage between access charges, for instance the e_cient component pricing rule that links the integrated monopolist's access and retail prices, to avoid margin squeezes,
(e) common carrier policies that means the turning of vertical structure of the industry upside down (referred to the semantic meaning of naming "upstream" and "downstream" operators),
(f) disclosure requirements the requirement for contracts of intermediary goods to be made public for the sake of transparency.

2 Vertical foreclosure

The "leverage" concept argued that there is a single source of monopoly pro_t, and that a bottleneck monopolist can earn the entire monopoly pro_t without extending its market power to related segments (vertical integration cannot increase pro_tability of merging _rms). For example, a bottleneck holder faces a commitment problem similar to that of a durable-good monopolist (see Coase's durable good analysis): once it has contracted with a downstream _rm for access to its facility, it is tempted to o_er access to other _rms as well (even if their competition to the other _rm will reduce monopolist's pro_ts). Nevertheless, the positioning (downstream or upstream) of the _rm is not aleatory and it has some important consequences on the monopolist's power. A comparison between exclusive contracts and commitment problem lead us to two major problems:
3
(a) upstream bottleneck's pro_t is smaller, the larger the number of downstream _rms, and
(b) for a given number of downstream _rms, the upstream pro_t is smaller, the more substitutable the downstream units.
The study of this problems lead the authors to derivate three major

policy implications:

(a) it is important whether the more competitive of two complementary sectors lies upstream or downstream (prices are lower if the bottleneck owner lies upstream),

(b) non-discrimination laws may have a perverse e_ect of restoring the monopoly power (when an upstream bottleneck practices foreclosure by discrimination among competitors, o_ering to all competitors the same commercial conditions forces bottleneck to sell further units at the same high price, that helps it to commit),

(c) ECPR (e_cient component pricing rule) has scarce e_ect on unregulated markets. It is a partial rule that provides a link between access and _nal prices (the higher the _nal price, the higher the access price can be).

A simple example of (1 monopoly X 2 retailers) in a two-stage game framework is built and we are reformulating the main results. Provided that the vertical structure of industry's monopoly output is formed by:

$Qm = argmax\ f(P(q)\quad c)qg$

$pm = P(Qm)$

$\_m = (pm\quad c)Qm = [P(Qm)]2\quad cQm:$

(1)

The interaction between _rms is described in the following: PLAYER STAGE I STAGE II EQUILIBRIUM

U MC = c; (q1(T1)); (q2(T2))

D1 T1(_) MC = 0

Rev1 = q1P(q1 + q2)

D2 T2(_) MC = 0

Rev2 = q2P(q1 + q2)

Consumer q = D(p); p = P(q)

Sub-cases related to observability hypothesis:

(a) Commitment, observability, credibility. Both tari_s T1; T2 o_ered by U are observed by both D1 and D2.U exerts his full market power such as to extract all Di's pro_t. Nevertheless, contract may be secret or can be privately renegotiated. If we have the following situation for instance:

$q2 = Qm$

2 ; T2 = pmQm

2

$q1 = argmaxq\ fq\ [P(Qm=2 + q)\quad c]g = RCournot > Qm=2$

with : P0 < 0;

(2)

Therefore there is an incentive to secretly contract between U and D1.

(b) Secret contracts At the _rst stage U o_ers secret contracts to each Di. The equilibrium is characterized by the Cournot quantities, prices and pro_ts:

$q1 = argmaxq\ f[P(q + q2)\quad c]\ qg = RCournot(q2); (8)q$

$q1 = q2 = qCournot = RCournot(qCournot) > Qm=2$

$p1 = p2 = pCournot = P(2qCournot) < pm$

$\_U = (pCournot\quad c)2qCournot = 2\_Cournot < \_m$

$\_D1 = \_D2 = 0:$

(3)

This result puts emphasis on the commitment problem faced by the monopoly supplier (a credibility problem prevents him to gain the monopoly outcome). In the case there are n downstream competitors, the symmetric passive conjecture equilibrium is given by $q = RCournot((n-1)q)$, where q is output per downstream _rm. The commitment problem becomes more severe, the larger the number of downstream _rms (increasing competition). Also, the same result is reached if we allow for downstream product di_erentiation. The retail prices are di_erent, respectively $p1 = P1(q1; q2)$ and $p2 = P2(q1; q2)$ and the equilibrium of the overall game is still a Cournot equilibrium (in which downstream _rms face a marginal cost c). The result is that the ratio of Cournot industry pro_t over monopoly pro_t increases with the degree of di_erentiation and the attractiveness of monopoly power is stronger the more substitutable are retail products. In this situation, foreclosure aims to reestablish monopoly power (U has an incentive to alter downstream market structure using techniques as: exclusive dealing, integration with downstream _rms, price oor).

The empirical experimental evidence that tests the foreclosure theory yield that non-integration with public o_ers and vertical integration lead the monopoly outcome whereas non-integration with secret o_ers result in Cournot outcome. Others _nd only partial support for this theory (see Martin et al.2001). The _eld studies results do not show relevant evidence of foreclosure e_ects (impact of vertical mergers on downstream rivals and end users) but claim that vertical integration may help solving commitment problems of upstream monopolies. Three are the tested hypotheses:

i. retail _rms (rivals) receive less input from or pay a higher price to the upstream monopolist _rm U;
ii. if D2 is publicly traded, then its stock price gets lower when merger U D1 is announced (if U does not extract all the rent from downstream units);
iii. _nal customers su_er from a merger (decrease in welfare is measured by a decrease in stock price or an increase in future price of _nal good).

6

2.1 Vertical foreclosure: Policy implications

The Coasian pricing problem is more likely to arise when monopolist bottleneck market is situated upstream. From the consumer or total welfare perspective it is preferable to put the more competitive sector downstream and let consumers deal directly to the competing operators. Additionally, non-discrimination laws aim to protect consumers from abuses of dominant position. In the context just described above, these non-discrimination laws have adverse e_ects on all consumers and total welfare, because they eliminate opportunistic behavior of U and allow it to fully exercise its monopoly power. If U offers the non-discriminatory two-part tari_ $T(qi) = \_m + cqi$ (wholesale price=marginal cost and _xed fee=monopoly pro_t), an equilibrium

will exist if the coordination between U   D1   D2 exists. The competitive sector will gain zero-pro_ts and U will gain the monopoly pro_t. If U does not consider the impact of a decrease in output on the downstream _rms pro_ts (and it has a quasi-concave objective function, $T(q) = wq$ and maximizes $\_U = (w(Q) \quad c)Q$), the result leads to a choice of $Q < Qm$.

2.2 Restore of monopoly power: vertical integration and exclusive dealing

Vertical integration leads to the exclusion of the non-integrated retail _rm, given that there is no other potential supplier for D2. The introduction of an alternative supplier ^{U} does not a_ect _nal prices and quantities or the structure of the production, but it produces a change in the pro_t sharing among U and retailers. We re-write the two-stages game with two alternative suppliers U and ^{U} : PLAYER STAGE I STAGE II EQUILIBRIUM

U UC = c; q1(T1); q2(T2)

^{U}

UC = $^c > c$; q1($^$ T1); q2($^$ T2)

D1 T1; $^$ T1 MC = 0

Rev1 = q1P(q1 + q2)

D2 T2; $^$ T2 MC = 0

Rev2 = q2P(q1 + q2)

Consumer q = D(p); p = P(q)

From the _rst two lines of the game above we observe that U is more e_cient than ^{U} , therefore it will potentially supply both D1 and D2, although under more favorable conditions for the retailers due to the competition with ^{U} 1.

If U and D1 integrate, the result leads to a reduction in the supply for D2 which faces a higher opportunity cost ($^c > c$):D2 will buy from ^{U} and the equilibrium quantities correspond to the asymmetric Cournot duopoly:

q1 = RCournot(qCournot

2)

q2 = RCournot(qCournot

1) _ argmaxq f(P(q + q1) ^{c})qg

with : $1 < R0Cournot(q) < 0$

$RCo^urnot(q) < RCournot(q)$

implying : 2qCournot < qCournot

1 + qCournot

2

_U+D1 = _Cournot

1 + (^{c} c)qCournot

2

_D2 = _Cournot

2

equil : c1 = c < c2 = ^{c};

(4)

Thus D2 obtains lower pro_ts than _U+D1 through integration, that

1more precisely, U will supply both _rms with the same qCournot but for the payment _Cournot   maxq

$$\overline{(P(q + q\text{Cournot}) \quad \char94c)q}$$

$\overline{}$
since each retailer can also buy from $\char94U$ at some
price $\char94p > \char94c$.
proves to bene_t integrated _rms. Vertical integration maintains pro-
duction e_ciency while it lowers consumer surplus and total welfare
(and the higher the cost of bypassing the bottleneck monopolist, the
larger the negative impacts on consumers and welfare). Vertical inte-
gration is more pro_table if $\char94c$ is higher.
Some policy solutions came along to limit the negative impact on wel-
fare of the vertical integration leading to foreclosure. With or without
vertical integration it is still desirable to ensure that the most com-
petitive sector faces _nal consumers. In the vertical integration case
with no bypass, it technically does not matter if the monopolist sector
is upstream or downstream, but by de_nition, there is no incentive to
integrate if the monopolist is situated downstream (in which case it
does not exist a commitment problem). In the case with possible by-
pass, the position of monopolist does matter (if it is downstream, the
less e_cient alternative supplier cannot be shut down and this results
in productive ine_ciency; there is also an indi_erence of U whether to
integrate with D1 or not).

Assuming the vertical integration between the upstream monopoly and
the downstream retailer, the equilibrium outcome without ECPR also
satis_es ECPR (it does not impose constraints on foreclosure, therefore
it is expected to perform a function it was not designed for). Under
the hypothesis of a single monopolist that integrates with D1, o_ering
a linear ECPR-compatible access price w2 < pm   0 = pm to D2. The
revenue of _rm D2 that buys q2 intermediary units and transforms them
into a _nal good is: [P(Qm + q2)   w2] q2 < [P(Qm)   w2] q2 = 0. A
negative pro_t for D2 imposes a situation of no-viable activity for this
retailer, as the authors state.
In the exclusive dealing case vertical integration may also yield social
bene_ts (not only social costs). These can be evaluated by investi-
gating alternative strategies available to foreclosure (such as exclusive
dealing or exclusive supply contracts 2) and their relative costs. An
exclusive dealing may represent a perfect substitute for vertical inte-
2see P.Rey and J.Tirole. A primer on Foreclosure. IO Handbook 2007. p.2176
gration (given that if vertical integration is prohibited, by an exclusive
agreement between U   D1, U commits himself not to sell to D2). That
is to say that a policy that prohibits vertical integration but allows for
exclusionary agreements (that may become socially less desirable be-
cause its rigid constraints), is of no use. Exclusive dealing is pro_table
in a context where we consider the alternative supplier $\char94U$ does not
impose any competitive constraint and he is less e_cient than U that
gets the monopoly pro_t with exclusive dealing (and the Cournot pro_t
in other case). Instead, by auctioning an exclusive deal, U can earn
_Excl
Cournot($\char94c$) = _Cournot
1   maxq

n

$$[P(q^{Cournot}_1(\hat c) + q) \quad \hat c]q$$

o

$$= (c \quad \hat c)q.$$

O_ering exclusivity or not yield zero pro_t when the second supplier is equally e_cient ($c = \hat c$), and are more pro_table when ^U is less e_cient $c < \hat c$. If there is no alternative supplier but the retailers produce a di_erentiated good, the integrated _rm U   D1 may still want to supply D2 whereas an exclusive agreement with D1 would lead to the exclusion of D2 (ine_ciency and reduction in welfare).

To conclude, exclusive dealing yields less pro_t to U than vertical integration. Secondly, the prohibition of vertical integration without norms on exclusive dealing leads to a socially less desirable outcome (it reduces the choice available to _nal consumers, by excluding rivals). Further subjects to be developed are indicated by the authors, namely:

(a) private incentives to support not-exclusivity. Independent users of intermediate goods may diminish investments that approach them to the upstream bottleneck, or to a competitive-technology sector (this choice is made when they anticipate the monopolist's foreclosure, because of an existing vertical integration). Competition protects investment in situations in which it is di_cult to write a long-term e_cient contract. Therefore, an monopolist that has to lower speci_c investments, does not want to compete in the future with a favored downstream user;

(b) the Coasian approach (Cestone and White 2003) that is applied beyond industrial markets, for instance to intermediary's ownership of equity;

(c) contract with externalities (Segal 1999) situations in which a principal contracts with multiple agents and one of the contracts has externalities on other agents. General results are obtained on the type of trade between the principal and agents (secret contracts and public commitments) as a function of the type of externalities;

(d) alternative conjectures such as the passive conjecture from the Cournot situation in which the monopolist produces to order. There is a strategic interdependence between for instance U and D1, when the contract signed with D1 a_ects conditions that U would like to o_er to D2 (that is the competitor of D1). This interdependence creates problems like non-concavity (that make disappear pure-strategy with passive beliefs 3.);

(e) bidding games that are situations in which downstream rival retailers bid (causing externalities on each other) for the input supplied by the upstream monopolist (that chooses how much to supply, eventually). On the contrary, if retailers determine quantities and o_ers are public, they can protect against opportunistic behavior of the rival by choosing a exible contract (adapt purchases to the terms in rival's contracts).

3 Horizontal foreclosure

It refers to a situation in which a _rm U is present in two _nal markets A (monopoly segment for _rm U) and B (the competitive segment

for _rm U). In this context it could appear a foreclosure situation
if U forecloses competitors in market B to link the bottleneck good
A to its own o_er on B (case invoked especially when A and B are
complements). Nevertheless, this situation is not pro_table for the _rm
U given that if it decides to foreclose rivals and become monopolist on
both markets (by bundling products A and B) it obtains a lower pro_t
than in the situation in which it keeps unbundling and _x a price such
3because the gain from simultaneously changing contracts o_ered to D1 and D2 may
exceed total gains from modi_cation of just one contract.
11
as to extract the pro_t of rivals on market B. If the _rm is integrated
and present on the two markets, it will be more likely to invest in B
(given that any increase in competition for B stimulates consumers to
pay for the monopolized product A). The same situation discourages
rivals to invest in B.
If the products are relatively independent, this logic does not hold any
more (as pointed out by the Chicago School and criticized by the paper
of Whinston (1990)). A demonstration is provided by considering that
in the B market there is a potential entrant E and _rm U must choose
if bundle or not the two products A and B. the results is that bundling
allows U to discourage E to enter the market. Nevertheless, if entry
occurs, U has no more incentive to bundle the two goods (the use of
bundling or tying as an entry barrier, relies on a strong commitment,
eventually obtainable through technological choices, for example, by
making A incompatible with with competitive B versions). If there is
no independence between A and B, the exit of competitors from market
B damages to good A. To conclude, bundling intensi_es competition
(we focus on compatibility choices of competing _rms that each o_er
all components of a system, example of endogenous switch of costs).
When _rms opt for compatibility, the market-by-market competition
prevails, where _rms compete separately for each component.

Furthermore, we focus on the entry decisions if we consider risky projects
on the two markets (authors consider now that U is a monopoly on both
A and B perfect complementary markets). An investment in research
and development will allow _rm E to enter the market. If it succeeds
to enter both markets it will replace U and will get all the gain on
both markets, whereas if E enters only one market, its gain depends
on the bundling decision of U (since goods are complementary) and E
becomes competitor for U. By considering the probability of success
of E, the authors derive a conclusion on the riskiness of entry projects
for E (in the absence of risk bundling decision of U is irrelevant).
In the case of economies of scale and scope two periods decisions for
the two _rms are analyzed for the two markets A and B. The resulting
12
conclusion is that if bundling is not made, the entrance on market A
of E is pro_table, whereas entry on market B is pro_table only if it
generates pro_ts in both periods. Also, entry is pro_table if E enters
market B in period 2. By bundling the two goods together, U deters
the entrance of E and allows U to maintain a monopoly pro_t over all
the two periods.

Furthermore it is interesting to observe how investments in research and development of adjacent market B in order to discourage competitive e_orts by rival producers. According to a Chicago School argument, _rm U has still incentive to innovate (even if it is forced, for the sake of innovation competition, to share the resulting intellectual property with some E) because improvements in the adjacent market bene_ts the dominant _rms core activity. With antitrust intervention there has been proved that no reinforcing of innovation can be made, and moreover, it would damage to the intellectual property law (trade-o_ between the bene_ts of competition and the protection of innovation from direct imitation). Competition in the B market brings product variety and lower costs and prices. Therefore, it augments the value of the bottleneck good and U's pro_t when the two goods are complementary and not tied. Bundling and foreclosure must have e_ciency-objectives and predatory intents. Motivations for bundling may be not related to competition (distribution and compatibility cost savings, liability and reputation, market segmentation and protection of intellectual property, etc) therefore bundling may be used as a reasonable act by the _rms.

4 Exclusive customer contracts and e_-ciency arguments

Firms may use their market power (through long term exclusive arrangements) in order to protect their position in the same market, even in absence of interaction with related markets. Firms could "lock" users through exclusive contracts (probably with the objective to extract some of the entrant's technological advantage). There are several types of exclusionary techniques:

(a) penalty for breach agreements

(b) renegotiation they have an exclusionary impact given that they rely on the assumption that U and D _rm cannot renegotiate their contract, once the entrant E has made an o_er. From the welfare point of view, exclusivity leads to over-investment relative to what would be socially desirable, whenever some conditions are meet in terms of c.d.f. of E's cost $([1 \quad {}^\wedge F(\_c)](\_c \quad c))+$

$R \_c$

$c \, d \, {}^\wedge F({}^\wedge c) < I < \_c \quad c$:

Exclusivity contracts in which downstream customers commit to purchase from an upstream supplier, may deter investments by competing upstream suppliers.

In the rent extraction perspective, penalties for breach agreements are used to force a more e_cient entrant to reduce its price. In the entry-deterrence theory, penalties for breach arise a free-riding problem of customers, when the entrant faces a large _xed cost for which it needs a large market in order to become a real competitor.

E_ciency arguments for vertical foreclosure are:

(a) forbearance as a reward to investment or innovation

(b) free-riding by downstream units on the marketing expenses

(c) excessive entry

(d) monitoring bene_ts of vertical integration

(e) costly divestitures

(f) costly expansion of capacity or costs incurred in order to provide access

(g) fear of being associated with inferior downstream partners that could damage the _rms's reputation

(h) universal service

E_ciency arguments for tying:

14

(a) preventing ine_cient substitution

(b) metering

(c) signaling quality

5 Conclusion