

# Industrial Economics

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AUEB – Erasmus Program



Slides

*Industrial Organization: Markets and Strategies*  
Paul Belleflamme and Martin Peitz, 2d Edition

## Couse Outline

1. **Basic Concepts** ✓
2. **Monopoly** ✓
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4. **Dynamic Oligopoly** ✓
5. **Product Differentiaton** ✓
6. **Cartels & Tacit Collusion** ✓
7. **Horizontal Mergers**
8. **Vertically Related Markets**
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# 7. HORIZONTAL MERGERS



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# 7.1 Introduction

## 7.1 Introduction

**Merger/Acquisition:** Previously independent firms unite/become one.

Crucial element the change in the “control” of a firm.

- **Merger:** A and B agree to combine to form C.
- **Acquisition:** A buys B and combines B into A.

In competition policy (and IO in most of the cases), the term “merger” is used for convenience to refer to both mergers & acquisitions.

# The Guardian

## BA and Iberia agree £5bn merger

**Shareholders in British Airways and the Spanish carrier Iberia approve deal to create an airline carrying 57 million passengers a year**

*Press Association*

Mon 29 Nov 2010 12.17 GMT




BA and Iberia will keep their individual identities after the merger Photograph: Albert Gea/Reuters

# FINANCIAL TIMES

Last updated: May 5, 2015 12:41 pm

## Mergers and acquisitions boom driven by ‘jumbo’ deals

Arash Massoudi, M&A Correspondent

 Share  Author alerts  Print  Clip

 Comments

Corner a banker at a cocktail party to explain the current boom in mergers and acquisitions and he or she will point to soaring stock prices, low interest rates for debt financing and the return of animal spirits in boardrooms.

But ask a shareholder and they will take a far more sceptical view.

After the financial crisis, so this counter-narrative goes, companies suspended payouts to investors and looked inward to aggressively cut costs. Even as balance sheets improved, executives remained timid and turned to share repurchases and dividends to keep shareholders at bay.

## 7.1 Introduction

### Selected individual deals

Acquirer  
**Shell**  
Target  
**BG Group**



Synergies  
**\$2.5bn**  
by 2018

Acquirer  
**Heinz**  
Target  
**Kraft Foods**



Synergies  
**\$1.5bn**  
by 2017

Acquirer  
**Nokia**  
Target  
**Alcatel-Lucent**



Synergies  
**€900m**  
in 2019

## 7.1 Introduction



REUTERS



TECHNOLOGY NEWS AUGUST 23, 2012 / 3:40 AM / 7 YEARS AGO

# FTC clears Facebook's acquisition of Instagram

Alexei Oreskovic

3 MIN READ



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SAN FRANCISCO (Reuters) - The U.S. Federal Trade Commission cleared Facebook Inc's acquisition of Instagram, voting unanimously to close its antitrust investigation into the deal without taking any action.

## 7.1 Introduction



REUTERS



TECHNOLOGY NEWS APRIL 10, 2014 / 11:02 PM / 6 YEARS AGO

# Facebook says WhatsApp deal cleared by FTC

Alexei Oreskovic

3 MIN READ



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SAN FRANCISCO (Reuters) - Facebook Inc said U.S. regulators have cleared its \$19 billion acquisition of mobile messaging service WhatsApp, even as the Federal Trade Commission warned the two Internet companies on Thursday that they must not backtrack on commitments to user privacy.

## 7.1 Introduction

TECH

# Microsoft Closes Acquisition of LinkedIn

Deal, valued at roughly \$26 billion, is biggest in tech company's history



Microsoft CEO Satya Nadella, shown in a November photo, announced the closure of the deal in a LinkedIn post.

PHOTO: ASSOCIATED PRESS

*By Joshua Jamerson*

Updated Dec. 28, 2016 1:45 pm ET

Microsoft Corp. [MSFT 0.14% ▲](#) closed its roughly \$26 billion deal to buy professional-networking site LinkedIn, cementing the largest acquisition in the tech giant's history.

## 7.1 Introduction

Three different types of mergers:

### 1. Horizontal Mergers

Between firms that compete with each other in the market, i.e., firms that produce substitute products and sell them in the same geographic market.

e.g., Peugeot & Citroen, Kraft & Heinz, British Airways & Iberia

### 2. Vertical Mergers

Between firms operating at different stages of the same vertical production chain. There is (potentially) a seller-buyer relationship between them.

e.g., eBay & PayPal, Netflix and Original Content Studios, IKEA & Forestry Operations

### 3. Conglomerate Mergers

Between companies whose products are completely unrelated (independent) or complementary from the perspective of their buyers.

e.g. Essilor/Luxottica, Booking/eTraveli, Google/Fitbit

# Horizontal Mergers: Theories of Harm & Defenses

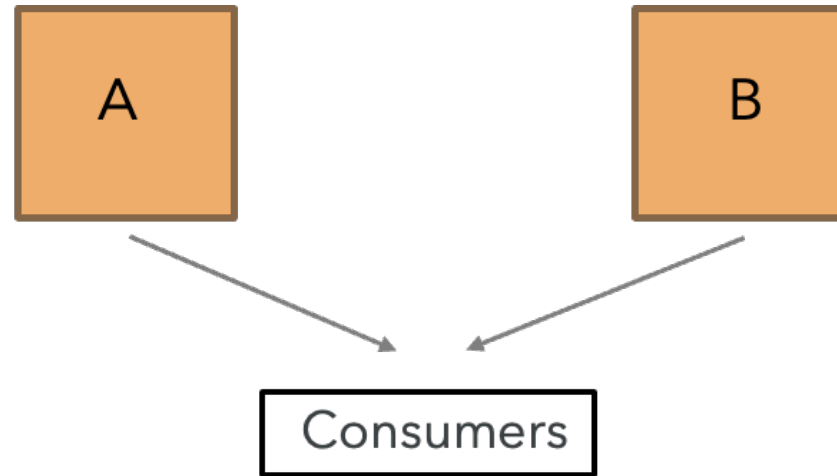
*“A theory of harm (ToH) is a hypothesis about how the process of rivalry could be harmed as a result of a merger.” (CMA, 2021)*

- There are three main theories of harm for Horizontal Mergers:
  - Unilateral effects:** Internalization of competitive externalities post merger leads to higher market power.
  - Coordinated effects:** The merger may facilitate of collusion.
  - Innovation ToH:** The merger may reduce firms investment in innovation.
- There is one main defense in favor of Horizontal Mergers:
  - Efficiency gains:** They may arise from merger-induced synergies in procurement, production or distribution, economies of scale.

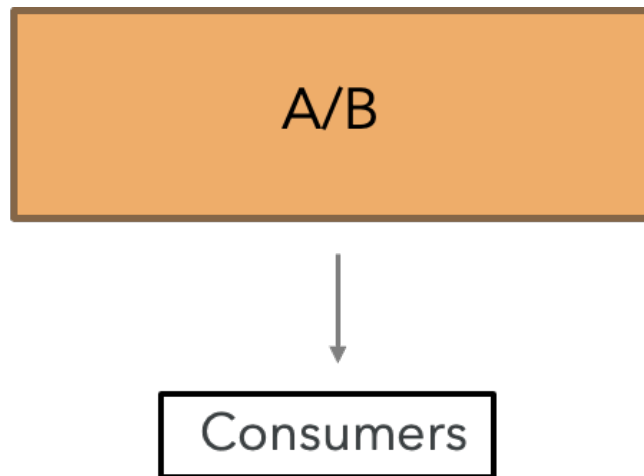
## 7.2 Economics of Horizontal Mergers

## 7.2 Economics of Horizontal Mergers

Status Quo (Before the Horizontal Merger):

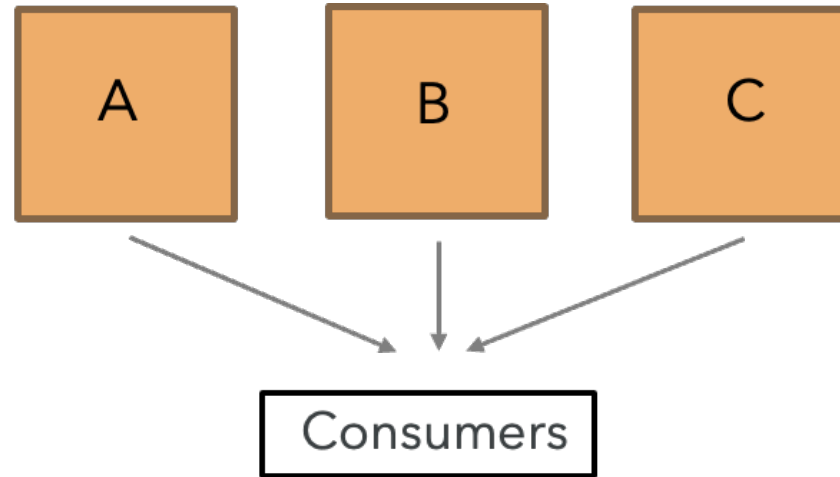


Horizontal Merger:

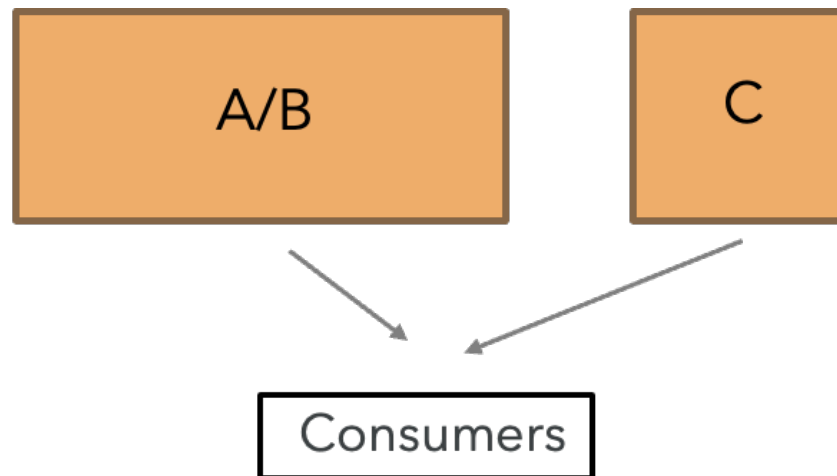


## 7.2 Economics of Horizontal Mergers

Status Quo (Before the Horizontal Merger):



Horizontal Merger:



### Merger to Monopoly

- **Model Assumptions:**

- $n = 2$  firms ( $i = 1, 2, \dots, n$ )

- Homogeneous products with the following market demand function:

$$P(q) = a - q$$

where total quantity  $q = q_1 + q_2$

- Cost function of firm  $i$ :  $C_i(q_i) = cq_i$  with  $a > c \rightarrow$  symmetric  $MC: c$

- Dynamic game:

Stage 1: Each firm decides whether or not it will merge with the other.

Stage 2:

**No merger**: Firms choose simultaneously and separately their quantities.

**Merger**: The firm that results from the merger (monopolist) chooses its quantity.

- No efficiency gains (i.e., no changes in the cost of firms post-merger).

## 7.2 Economics of Horizontal Mergers

### Merger to Monopoly

- **Model Solution – Equilibrium:**

Solution by Backward Induction:

- Stage 2

There are two subgames. We find the Nash equilibrium in each of them.

**(i) No Merger:** *Cournot oligopoly*

Each firm  $i$ , with  $i, j = 1, 2$  and  $i \neq j$ , solves the following:

$$\text{Max}_{q_i} \pi_i = P(q_i, q_j)q_i - C(q_i) = (a - q_i - q_j)q_i - cq_i$$

FOC:

$$\frac{d\pi_i}{dq_i} = a - 2q_i - q_j - c = 0$$

## 7.2 Economics of Horizontal Mergers

### Merger to Monopoly

- **Model Solution – Equilibrium (cont.):**

In Nash equilibrium each firm “plays” its Best-response:

$$q_1(q_2) = \frac{a - c - q_2}{2} \quad \& \quad q_2(q_1) = \frac{a - c - q_1}{2}$$

Solving the system of the BRs, we find:

$$q_1^{X\Sigma} = \frac{a - c}{3} \quad \& \quad q_2^{X\Sigma} = \frac{a - c}{3}$$

Note: XΣ is notation for No Merger while Σ is for Merger

$$\rightarrow P^{X\Sigma} = \frac{a + 2c}{3}$$

$$\rightarrow \pi_1^{X\Sigma} = \pi_2^{X\Sigma} = \frac{(a - c)^2}{9}$$

## 7.2 Economics of Horizontal Mergers

### Merger to Monopoly

- **Model Solution – Equilibrium (cont.):**

#### (ii) Merger: Monopoly

We know (see section 2) that the equilibrium outcomes are:

$$P^\Sigma = \frac{a+c}{2} \quad Q_{12}^\Sigma = \frac{a-c}{2} \quad \pi_{12}^\Sigma = \frac{(a-c)^2}{4}$$

- Stage 1

If they merge:

$$\pi_{12}^\Sigma = \frac{(a-c)^2}{4}$$

If they do not merge:

$$\pi_1^{X\Sigma} + \pi_2^{X\Sigma} = 2 \frac{(a-c)^2}{9}$$

Comparing:

$$\frac{(a-c)^2}{4} - 2 \frac{(a-c)^2}{9} > 0$$

Firms have incentive to merge.

## 7.2 Economics of Horizontal Mergers

### Merger to Monopoly

- **Model Solution – Equilibrium (cont.):**

#### Merger Implications:

$$P^{\Sigma} = \frac{a+c}{2} > P^{X\Sigma} = \frac{a+2c}{3} \quad \text{Unilateral effect}$$

$$\pi_{12}^{\Sigma} = \pi^M > \pi_1^{X\Sigma} + \pi_2^{X\Sigma}$$

$$CS^{\Sigma} < CS^{X\Sigma}$$

$$TS^{\Sigma} < TS^{X\Sigma}$$

The horizontal merger which creates a monopoly in the market benefits the firms, harms consumer surplus and total welfare.

## 7.2 Economics of Horizontal Mergers

### Merger Not to Monopoly

- **Model Assumptions:**

- $n > 2$  firms ( $i = 1, 2, \dots, n$ )

- Homogeneous products with the following market demand function:

$$P(q) = a - q$$

where total quantity  $q = q_1 + q_2 \dots + q_n$

- Cost function of firm  $i$ :  $C_i(q_i) = cq_i$  with  $a > c \rightarrow$  symmetric  $MC: c$

- Dynamic game:

Stage 1: Firms 1 & 2 decide whether or not they will merge with each other.

Stage 2:

**No merger**: Firms choose simultaneously and separately their quantities.

**Merger**: The firm that results from the merger and each of the no merged firms choose simultaneously and separately their quantities.

- No efficiency gains

## 7.2 Economics of Horizontal Mergers

### Merger Not to Monopoly

- **Model Solution – Equilibrium:**

- Stage 2

- (i) No Merger:** Cournot with  $n$  firms

Each firm  $i$ , with  $i, j = 1, 2, 3, \dots, n$  and  $i \neq j$ , solves the following:

$$\text{Max}_{q_i} \pi_i = (a - q_i - Q_{-i})q_i - cq_i$$

where  $Q_{-i} \equiv \sum_{j \neq i} q_j$

FOC:

$$\frac{d\pi_i}{dq_i} = a - 2q_i - Q_{-i} - c = 0$$

$$\rightarrow q_i(Q_{-i}) = \frac{a - c - Q_{-i}}{2} \quad \text{Best-response function}$$

Since firms are symmetric, we know that in the Nash equilibrium, their quantities will be equal:

$$q_1 = q_2 = q_i = \dots = q_n$$

## 7.2 Economics of Horizontal Mergers

### Merger Not to Monopoly

- **Model Solution – Equilibrium (cont.):**

Solving the system of the BRs:

$$q_i(Q_{-i}) = \frac{a - c - Q_{-i}}{2} \rightarrow q_i = \frac{a - c - (n-1)q_i}{2}$$

$$\rightarrow 2q_i + (n-1)q_i = a - c$$

$$\rightarrow q_i^{X\Sigma} = \frac{a - c}{n+1}$$

$$\rightarrow P^{X\Sigma} = \frac{a + nc}{n+1} \quad \& \quad \pi_i^{X\Sigma} = \frac{(a - c)^2}{(n+1)^2}$$

Note: When  $n$  increases, the price, the quantity and the profit of *each* firm decreases.

## 7.2 Economics of Horizontal Mergers

### Merger Not to Monopoly

- **Model Solution – Equilibrium:**

(ii) **Merger:** Cournot with  $n - 1$  firms

Solving in a similar way as before, we find:

$$q_i^\Sigma = \frac{a-c}{n} \rightarrow P^\Sigma = \frac{a+(n-1)c}{n} \quad \& \quad \pi_i^\Sigma = \frac{(a-c)^2}{n^2}$$

- Stage 1

If they merge:

$$\pi_{12}^\Sigma = \frac{(a-c)^2}{n^2}$$

If they do not merge:

$$2\pi_i^{X\Sigma} = 2 \frac{(a-c)^2}{(n+1)^2}$$

Comparing:

$$\pi_{12}^\Sigma < 2\pi_i^{X\Sigma}$$

Firms do not have merger incentives.

**“Merger Paradox”**

Note: Although the merger leads to increase in price.

## 7.2 Economics of Horizontal Mergers

### Merger Not to Monopoly

- **Explanation for the “Merger Paradox”:**

Quantity Competition (“strategic substitutes”): A decrease in the quantity of one firm is combined with an increase in the quantity of its competitors.

When two firms merge, they reduce their total quantity ( $q_{12}^{\Sigma} < q_1^{X\Sigma} + q_2^{X\Sigma}$ ) as they now operate as one firm.

→

The optimal response of their competitors (“outsiders”) is to increase their own quantity ( $q_3^{\Sigma}, q_4^{\Sigma}, \dots$ ) – **“Business stealing effect”**.

→

The merger leads to an increase in price but not a sufficient increase due to the behaviour of competitors.

The competitors of the merging firm (“outsiders”) - and not the merging firms benefit from the merger.

### Model of Salant, Switzer & Reynolds (1983)

- **Model Assumptions:**

The same assumptions as in the previous model with one main difference:

Assumption that  $k$  from the  $n > 2$  firms, with  $k > 2$  decide if they will merge between them.

- **Model Solutions - Equilibrium:**

- Stage 2

**(i) No Merger:** Cournot with  $n$  firms

Same solution as before:

$$q_i^{X\Sigma} = \frac{a - c}{n + 1}$$

$$P^{X\Sigma} = \frac{a + nc}{n + 1} \quad \& \quad \pi_i^{X\Sigma} = \frac{(a - c)^2}{(n + 1)^2}$$

## 7.2 Economics of Horizontal Mergers

### Model of Salant, Switzer & Reynolds (1983)

- **Model Solutions – Equilibrium (cont.):**

**(ii) Merger:** Cournot with  $n - k + 1$  firms

The solution now is:

$$q_i^\Sigma = \frac{a-c}{n-k+2} \quad \& \quad \pi_i^\Sigma = \frac{(a-c)^2}{(n+1)^2}$$

- Stage 1

If they merge:

$$\pi_i^\Sigma = \frac{(a-c)^2}{(n+1)^2}$$

If they do not merge:

$$k\pi_i^{X\Sigma} = k \frac{(a-c)^2}{(n+1)^2}$$

Comparing:

$$\pi_i^\Sigma = \frac{(a-c)^2}{(n+1)^2} > k\pi_i^{X\Sigma} = k \frac{(a-c)^2}{(n+1)^2}$$

**Merger if and only if:**  $k > \frac{1}{2} \left( 2n + 3 - \sqrt{4n + 5} \right) > 0.8n$

**“Rule of 80%”**

### Model of Salant, Switzer & Reynolds (1983)

Mergers between multiple firms are only profitable for Cournot competition if a highly concentrated market results.

Profitability depends on 2 opposite forces:

- By internalizing previous rivalry, the merged entity reduces its quantity and thereby increases its profit.
- But, outside firms react by increasing their quantity, which reduces the profitability of the merger.

For the 1<sup>st</sup> effect to dominate, the number of “outside” firms must be small enough.

### Model with Bertrand Competition with $n > 2$ firms & Homogeneous Products

Due to the “Bertrand Paradox”, the equilibrium price = marginal cost in both subgames (No Merger & Merger).

- Firms’ profits will be zero in both subgames.
- Firms will be indifferent to whether they merge or not.

### Model with Bertrand Competition with $n > 2$ firms & Horizontally Differentiated Products

Firms, even when  $k = 2$ , will have merger incentives (no “Merger Paradox”).

*Why?* Price increase by merged firm is matched by price increase of competitors (“outsiders”) – strategic complements Reaction of outsiders reinforces initial price increase that results from merger.

- Merger of any size is beneficial for merging firms.

### Other Model Variations

- Cournot with horizontally differentiated products
- Cournot with firms that have asymmetric costs
- Bertrand with firms that have asymmetric costs
- ....

### Merger with Efficiency Gains

- If merger confers an advantage to merged entity with respect to the outside firms:

Merged firm does not ↓ its production so much.

→ Outside firms do not ↑ their production so much.

More mergers should become profitable in the presence of efficiency gains.

- There are different types of efficiency gains:
  - Economies of scale
  - Synergies

(Next we focus on synergies)

### Merger with Efficiency Gains (Synergies)

- **Model Assumptions:**

- $n > 2$  firms ( $i = 1, 2, \dots, n$ )

- Homogeneous products with the following market demand function:

$$P(q) = a - q$$

where total quantity  $q = q_1 + q_2 \dots + q_n$

- Cost function of firm  $i$ :  $C_i(q_i) = cq_i$  with  $a > c \rightarrow$  symmetric  $MC: c$

- Dynamic game:

Stage 1: Firms 1 & 2 decide whether or not they will merge with each other.

If they merge, the MC of the merged firm becomes  $c - x$ , with  $0 < x \leq c$

Stage 2:

**No merger**: Firms choose simultaneously and separately their quantities.

**Merger**: The firm that results from the merger and each of the no merged firms choose simultaneously and separately their quantities.

## 7.2 Economics of Horizontal Mergers

### Merger with Efficiency Gains (Synergies)

- **Model Solution – Equilibrium:**

- Stage 2

(i) **No Merger:** Cournot with  $n$  firms

$$\rightarrow q_i^{X\Sigma} = \frac{a-c}{n+1}$$

$$\rightarrow P^{X\Sigma} = \frac{a+nc}{n+1} \quad \& \quad \pi_i^{X\Sigma} = \frac{(a-c)^2}{(n+1)^2}$$

(ii) **Merger:** Cournot with  $n-1$  asymmetric firms

$$q_{12}^{\Sigma} = \frac{a-c+(n-k+1)x}{n-k+2} \quad \& \quad q_0^{\Sigma} = \frac{a-c-x}{n-k+2}$$

Mergers between Cournot competitors that do not result in a highly concentrated market are profitable only if they entail sufficiently large synergies.

## 7.3 Mergers & Competition Policy

### Treatment of Mergers by the European Union (EU)

#### **Which mergers are examined by the European Commission (EC)?**

If the annual turnover of the combined firms exceeds specified thresholds in terms of global and European sales, the proposed merger must be notified to the EC. Below these thresholds, the national competition authorities may review the merger.

These rules apply to all mergers no matter where in the world the merging companies have their headquarters or production facilities.

The EC may also examine mergers which are referred to it from the national competition authorities of the EU member-states.

Member-states, through their national competition authorities and national law, control mergers without EU dimension that affect their national markets.

## 7.3 Mergers & Competition Policy

### Treatment of Mergers by the European Union (EU)

The original merger control regulation was Council Regulation 4064/89 of 1989.

Currently in force: Council Regulation (EC) No 139/2004 of 2004 on the control of concentrations between undertakings (hereafter the EU Merger Regulation).

According to the EU Merger Regulation:

*“A concentration which would significantly impede effective competition (SIEC), in the common market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position, shall be declared incompatible with the common market.”*

### Treatment of Mergers by the European Union (EU)

According to the EU Horizontal Merger Guidelines:

- Post-merger market shares of 20% or less are presumed to be compatible with the common market.
- The EC is unlikely to challenge a merger with a post-merger market concentration *H*-index below 0,1. It is also unlikely to challenge a merger with a post-merger *H*-index between 0,1 and 0,2 and an addition to the *H*-index of less than 0,025 points.
- “Efficiencies brought about by a merger counteract the effects on competition and in particular the potential harm to consumers that it might otherwise have.”

## 7.3 Mergers & Competition Policy

### Treatment of Mergers by the European Union (EU)

#### Procedure:

The EC must be notified of any merger with an EU dimension prior to its implementation.

There are two main examination phases in the merger analysis:

**1st phase:** Duration 25 days

More than 90% of all cases are resolved in Phase I.

It involves requests for information from the merging firms or third parties & questionnaires to competitors or customers seeking their views aimed at clarifying the conditions for competition in a given market or the role of the merged firms in that market.

There are two possible conclusions of the 1<sup>st</sup> phase:

- The merger is cleared, either unconditionally or subject to accepted remedies;
- The merger still raises competition concerns and the EC opens a 2<sup>nd</sup> phase investigation.

# Treatment of Mergers by the European Union (EU)

### 2nd phase: Duration 90 days

It typically involves more extensive information gathering, including firms' internal documents, extensive economic data, more detailed questionnaires to market participants, and/or site visits.

In phase II the EC also analyses claimed *efficiency gains* which the firms could achieve when merged together. If the positive effects of such efficiencies for consumers would outweigh the mergers' negative effects, the merger can be cleared.

In order to be taken into account, efficiencies must fulfill strict conditions and it is for the merging firms to prove that they are met:

1. The claimed efficiencies must be verifiable (such as that the EC can be reasonably certain that they will materialize and be substantial enough).
2. The efficiencies must be merger specific (i.e. they cannot be achieved by other means than by a merger).
3. The efficiencies must be likely passed-on to consumers, and not only recapped by the merging companies alone.

### Treatment of Mergers by the European Union (EU)

Following the 2<sup>nd</sup> phase investigation, the EC may either:

- Unconditionally clear the merger; or
- Approve the merger subject to remedies; or
- Prohibit the merger if no adequate remedies to the competition concerns have been proposed by the merging parties.

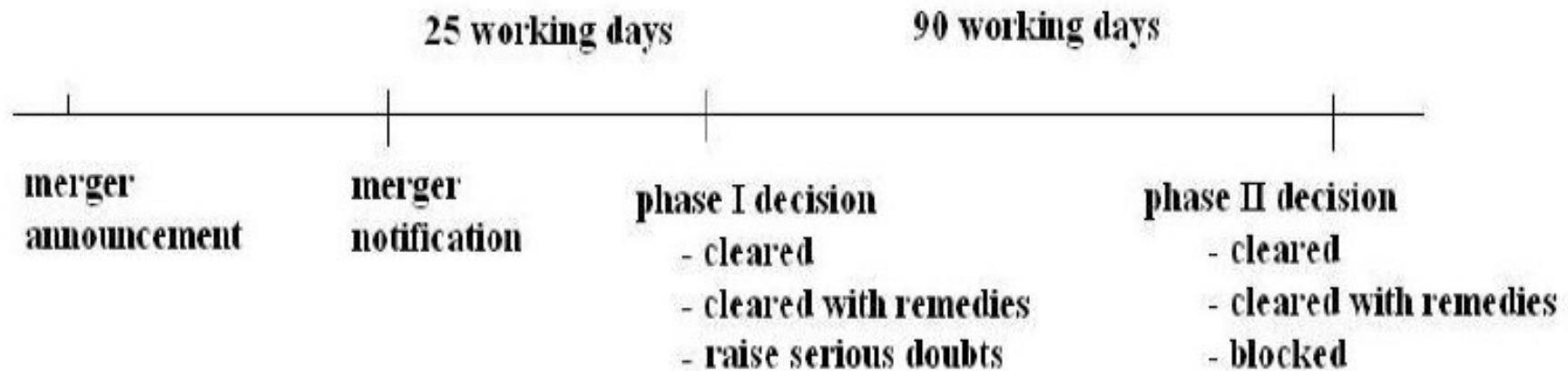
#### Judicial review

All decisions and procedural conduct of the EC are subject to review by the General Court and ultimately by the EU Court of Justice.

The firms or other parties demonstrating an interest can appeal within 2 months of the decision.

## 7.3 Mergers & Competition Policy

### Treatment of Mergers by the European Union (EU)



# Treatment of Mergers by the European Union (EU)

## Remedies

If the EC has concerns that the merger may significantly affect competition, the merging firms may offer remedies ("commitments"), i.e. propose certain modifications to the project that would guarantee continued competition on the market.

Firms may offer remedies in 1<sup>st</sup> phase or 2<sup>nd</sup> phase.

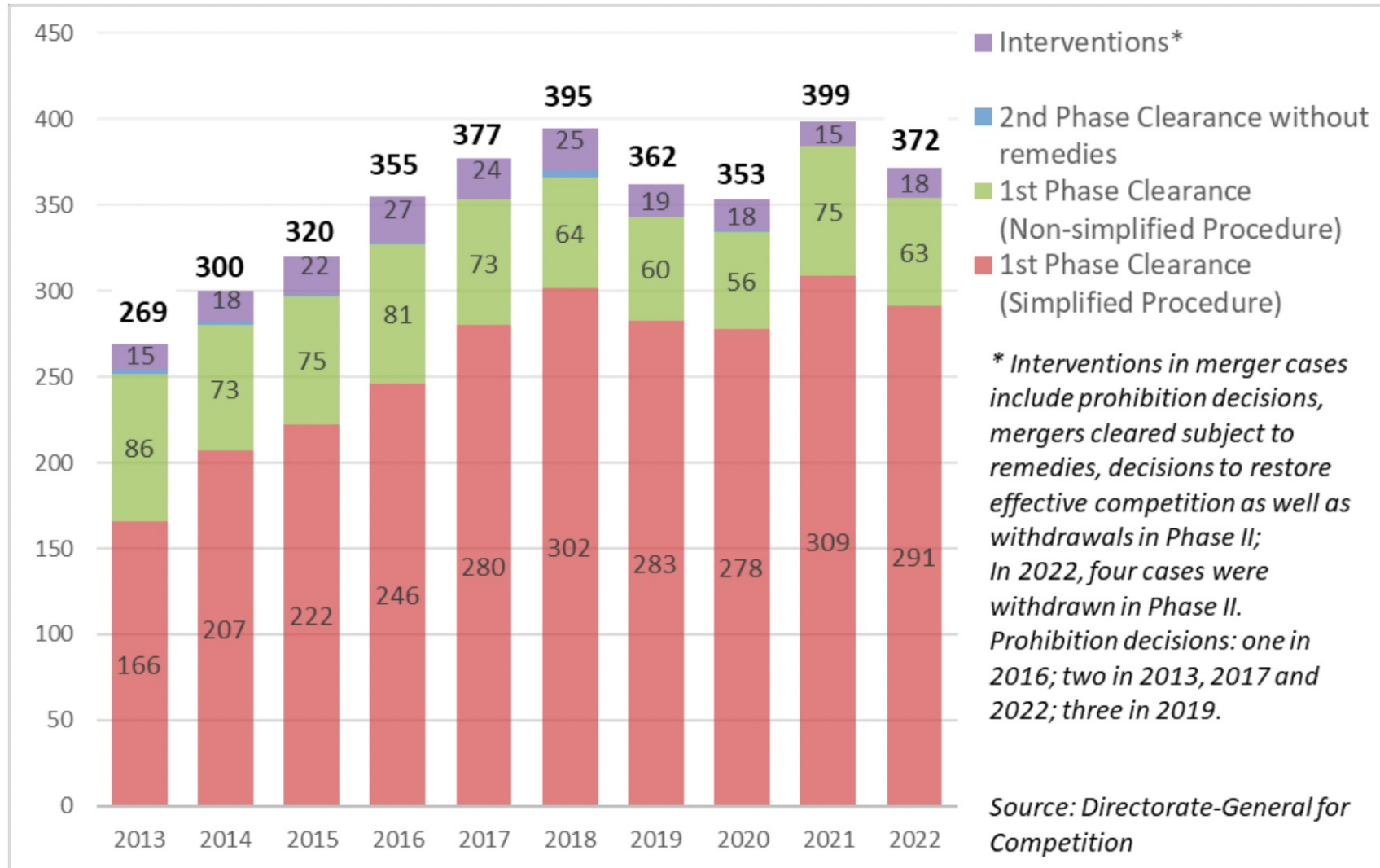
The EC analyses whether the proposed remedies are viable, and sufficient to eliminate competition concerns.

If remedies are accepted, they become binding upon the firms. An independent trustee is then appointed to oversee compliance with these commitments.

## 7.3 Mergers & Competition Policy

# Treatment of Mergers by the European Union (EU)

European Commission Decisions 2013 -2022



# EU MERGER CONTROL

## Interventions from December 2019

Since December 2019, 32 transactions were approved with remedies (of which 23 were cleared in Phase 1 and nine after an in-depth Phase 2 investigation). Remedies can be structural (such as full divestments), quasi-structural (e.g. data silos) or behavioural (such as access or interoperability conditions). Only one transaction was approved in Phase 2 without remedies, and five transactions were abandoned while under in-depth review, three of which after a Statement of Objections had been issued. One proposed transaction has been prohibited.

