

Commentary for teachers

# Market and price formation

## Overview

### Topic and contents

The topic of this teaching unit is the formation of prices, on markets in general and on well-organised and transparent markets (e.g. a commodities exchange) in particular. With the aid of a game, students experience first hand how markets function.

The unit is a good introductory tool, explaining basic concepts such as price formation on markets, equilibrium, supply and demand, trading profit and market efficiency; it also offers some deeper insights into selected points.

### Didactic format

The main element is 'Pitgame', a game that is played in class and is supported by a browser-based, interactive presentation. Playing the game requires a computer with internet access and a connected projector (or any other method that allows all players to view the game screen).

The interactive presentation can be launched via [pitgame.iconomix.ch](http://pitgame.iconomix.ch). Technical requirements are an internet connection and an up-to-date browser (Chrome, Edge, Firefox, Safari).

### Time required

Two to four lessons, depending on the degree of detail with which the topic is addressed.

### Suitable subjects

Economics and law (GYM), economics and social studies (KV).

### Level

Intermediate. The game itself can be used in a wide range of contexts, however the follow-on tasks (worksheets) can be configured as appropriate, depending on how advanced the students are. Worksheets 1 and 2A are suitable for all types of schools. The worksheet 2B is intended as an optional supplement for GYM and BM.

### Resources accompanying the unit

The unit consists of this commentary for teachers and the following teaching material:

- [Interactive presentation Pitgame](#)
- ['Introduction to Pitgame' slides](#)
- [Worksheet 1 \(key questions for game evaluation, all types of school\)](#)
- [Worksheet 2A \(near transfer, all types of school\)](#)
- [Worksheet 2B \(far transfer, optional supplement for GYM/BM\)](#)
- [Sample answers for teachers](#)
- [Intro text](#)

## Competence-oriented learning goals

### The students can...

... compare findings from the evaluation of the game with economic theory and observations from everyday life.

... explain how a market price is formed in a well-organised market and what an equilibrium price is.

... explain what is meant by trading profit and market efficiency.

... explain the effects of taxes, subsidies and minimum prices on supply, demand and the equilibrium price (GYM/BM only).

## Notes regarding this unit

### Economic background

In 1948, Edward Hastings Chamberlin (1899–1967), an American economist, published a paper in which he developed the Pitgame market experiment. His goal was to demonstrate systematic divergences from the accepted theory of perfect (or perfectly competitive) markets. Paradoxically, today his experiment is very well suited to teaching students (and not just those studying economics) about basic concepts such as price formation on markets, equilibrium, supply and demand, trading profits, and market efficiency.<sup>[1]</sup>

For details on the economic concepts taught, refer to the [intro text](#).

### Pitgame

In Pitgame, students take on the role of traders on a commodities exchange. Their goal is to purchase the commodity at the lowest possible price or sell it at the highest possible price. The maximum purchase price or minimum sale price is specified on each student's playing card.

**A minimum of 12 players is required for the game.** Game preparation, as well as playing the game and evaluating it in class, are supported by the interactive, browser-based presentation.

## Possible lesson plan

The teaching material is designed with a pro-active and problem-solving approach in mind (see [www.iconomix.ch/didactics](http://www.iconomix.ch/didactics)). The targeted skills can be developed in three phases, as follows:

### Phase 1: Engage with the material

In the first phase, the students play Pitgame. The teacher oversees the game and keeps a record of the completed trades, unless this role has been delegated to a (proficient) student.

1. The teacher sets up a new game (determines the number of players, selects the product) and prints out the playing cards (either immediately before the game or in advance).
2. The teacher explains the game and the rules using the ‘ [Introduction to Pitgame](#)’ presentation.
3. The teacher distributes the cards with the buyer/seller roles and the purchase/sale orders.
4. When the game starts, the students try to complete a trade in the designated trading area, based on the details on their cards.
5. As soon as two players agree a trade, they go to the teacher (or trade registration area) and hand over their cards. The teacher (or person in charge of the trade registration area) enters their names and the trade price into the computer. The agreed trade prices are immediately beamed onto the projector screen.
6. Once no more trades are being agreed, the teacher announces the end of the round, redistributes the cards and starts a new round.



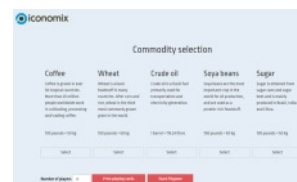
With the interactive Pitgame, the classroom becomes a trading room. (Images: Stefan Huser)



The task on the card: ‘Buy 100 pounds of coffee for 46 Dollars at most’



After the students have reflected on their approach during Pitgame, the teacher summarises the most important results.



While preparing the game, the teacher can choose from five commodities: coffee, wheat, crude oil, soya beans and sugar. (Excerpt from the browser-based, interactive presentation)

### Supplement for GYM and FVB:

#### ‘Competitive Market Game’ by MobLab

The online simulation ‘Competitive Market’ by MobLab is an ideal extension of the Pitgame. The simulation allows students to playfully experience the effect of the introduction of taxes, subsidies or minimum prices on supply, demand and the equilibrium price.

The simulation is in English and access is free of charge for Iconomix users:

- Where can I find the MobLab online simulations?
  - [MobLab classroom login](#)
- How do I run a MobLab online simulation?
  - [A six-step guide](#)
  - [Video tutorials](#)
- What is the ‘Competitive Market Game’ about?
  - [Brief description of the simulation](#)

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► **Notes on game preparation**

- A printer will be required if the teacher wishes to print out the playing cards in class.
- Nonetheless, it's a good idea to print the cards in advance and bring them to class. Then, during the lesson, you simply have to re-enter the same number of players and the same product as before in the computer, so that you can use the cards you prepared. (If the parameters differ, the names and prices on the playing cards will not match those in the system).
- If there are fewer students than pre-printed cards, you have the following options:
  - a. Remove the card with the lowest maximum purchase price. If necessary, you can also remove the card with the highest minimum sale price. And so on.
  - b. The teacher prints out a second set of playing cards and decides in class which game to run (e.g. for a class of 20 students, he/she prints out a set of cards for 20 players and a set for 18 players).

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► **Notes on playing the game**

- Plan in advance how the classroom should be arranged. Trading should be restricted to one area of the room (the trading area). The trade registration area, meanwhile, should be set up in such a way that the players queuing to have their trades registered do not get in the way of the projector or the other players.
  - The teacher may find it more efficient to have a (nimble-fingered) student record the trades.
  - To make it easier to identify the buyers and sellers, the two groups could stand on opposite sides of the trading area at the beginning of each round.
  - A minimum of three rounds should be played. A relatively stable price usually comes about quite quickly, at which stage the game can be concluded.
  - To allow the equilibrium price to establish itself more quickly, the students should refrain from forming groups (or sub-markets). They should also keep an eye on the prices on the screen and try to negotiate the best possible price, rather than accepting the first offer they get. If necessary, the teacher should remind them of these points from the second round onwards.
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## Phase 2: Discuss and reflect

The second phase involves an evaluation and a session in which the students reflect, either individually or in groups, on the way the Pitgame simulation went.

### Reflecting on how the game went, individually or in the group

Once Pitgame is over, the participants think about how they played the game. A set of written questions guides this process (Worksheet 1). The idea here is that students explore why they made certain decisions at certain times and thereby gain an understanding (still partly intuitive at this stage) of the price mechanism.

### Evaluation using interactive presentation

The students examine the evaluation charts and the table in the interactive presentation (can be printed out using the 'Print' function in the browser).

With the help of the written questions 4 to 8 in Worksheet 1, they then interpret their own observations and see how they relate to the concepts of equilibrium, supply and demand. The teacher oversees the discussion and provides assistance as needed.

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#### ► Notes on evaluating the game

- To ensure that the students are engaged and do not (wrongly) regard the game evaluation as trivial, it is advisable to only show the trading record at first. The chart with the supply/demand curve can be added in as the discussion progresses.
- To generate a screenshot (e.g. to save the trading history and trading overview results), use the 'Print' function in the browser. To restart or end Pitgame, use the 'Refresh' function in the browser.

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## Phase 3: Practise and apply

This phase is all about consolidation and transfer – the students can reinforce the skills they have acquired through practice and expand their skills by tackling more challenging tasks.

Two documents are available for this phase:

- **Worksheet 2A (near transfer, all types of school)**

The transfer questions in Worksheet 2A present the concepts behind Pitgame in a comprehensible manner. They feature examples from everyday life that the students can easily relate to. The tasks are not linked, so the teacher can configure them however he or she sees fit.

- **Worksheet 2B (far transfer, optional supplement for GYM/BM)**

The transfer tasks help the students to practise and internalise the concepts in unfamiliar contexts. The hands-on nature of the cases selected facilitates the transfer from Pitgame to the multifarious world of real-life markets. The tasks focus on market imbalances, the effects of market changes, government interventions, and the special characteristics of markets like the housing market. Furthermore, one task elaborates on the subject of price elasticities. The students come to understand the relevance of the concepts they have been exploring for their own lives. The teacher can pick the tasks that best match the needs and interests of the class.

**Supplement for GYM and FVB:****'Competitive Market Game' by MobLab**

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## Overview of possible lesson plan

	Steps	Description	Media/material	Time
<b>Phase 1</b> Engage with the material  45 minutes	Introduction	Introduction to 'Pitgame'	<a href="#">'Introduction to Pitgame' slides</a> , computer and video projector	10 minutes
	Game	Starting the game	<a href="#">Interactive presentation Pitgame</a> , computer and video projector	35 minutes
<b>Phase 2</b> Discuss and reflect  40–65 minutes	Evaluation and reflection	Evaluation of the game based on the key questions from worksheet 1, individually or in pairs. Discuss the result in the group.	<a href="#">Worksheet 1, sample answers</a>	30–45 minutes
	Theory	Study intro text (possibly as homework) or teacher presentation	<a href="#">Intro text</a>	10–20 minutes
<b>Phase 3</b> Practise and apply  45–90 minutes	Transfer tasks	Complete transfer tasks individually or in pairs	<a href="#">Worksheet 2A, sample answers</a>	45 minutes
	Transfer tasks (advanced, optional)	Complete transfer tasks individually or in pairs	<a href="#">Worksheet 2B, sample answers</a>	45 minutes

## Useful questions and answers for Pitgame

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- ▶ Isn't the result (equilibrium price) a foregone conclusion, if the reservation prices are predetermined? The reservation prices merely provide a fairly wide price range; even within this range, it is possible for prices to diverge widely from the equilibrium price. For example, a buyer and a seller who each have an extremely low reservation price could agree to trade at a price well below the equilibrium.
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- ▶ Why are the cards redistributed at the end of each round? Simply to ensure that it's not always the same players who find themselves with little or no chance of making a trade.
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- ▶ **Why can't the students set up the orders (reservation prices) themselves? They have no power to decide anything!** This was done for practical reasons. It makes it possible to prepare the game in advance (and no time is wasted in class). Anyway, the game would not be very different if the players set the reservation prices themselves. The important point is that the players have to decide how much to concede during trading.
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- ▶ **Is it very unnatural to have predetermined reservation prices? What are they supposed to represent?** At some point, every buyer reaches an upper price threshold above which they would stop buying a product. The only unnatural thing is that in the game this threshold is written down, rather than being a subconscious concept, as is often the case in real life. Likewise, every seller also has a lower price threshold. We could also postulate that the players are traders who receive orders in which their customers set binding limits.
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#### Footnotes:

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<sup>[1]</sup> Source: Charles A. Holt (2007), Markets, Games & Strategic Behavior, Addison Wesley (Boston, US)