

# Space & Agriculture<sup>1</sup>

## *This Month in the Economy Exercise*

### Instructor's Guide

#### This Month in the Economy Exercises

These teaching packs are designed for 30-minute (online or offline) sessions that can be included within any lecture or tutorial class. They are designed to be suitable for university students, but could easily be adapted for higher or lower levels. Every month, we will publish at least one exercise that you can use to engage your students with current events. The main aims of these exercises are to give students practice in relating economic ideas to the real world and their own lived experiences.

Newspaper articles or videos are used as the entry point to an economic topic, which is then expanded upon by the instructor before the students are broken into small groups to engage in an activity. This will help students develop the skills required to work as economists in the real world, and all the materials you need are provided. These teaching packs are published as creative commons (CC BY) and can be freely used and adopted.

#### Space & Agriculture

In this teaching pack, we look at satellite crop monitoring and how it is used for both real and financial economic activities. By looking at commodity futures, we give students a sense of what financialisation can mean. In the active exercise, students learn to discuss these matters and reflect upon them.

The central aim of this lesson is to get students to understand and reflect upon a case of financialisation. For this, students need to have a rough idea of what satellite crop monitoring and commodity futures are, but do not need to be able to perfectly reproduce all the details.

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<sup>1</sup> We want to thank Charan van Krevel, Dirk Damsma, Koen Vermeylen, and Vera Veltman for their advice and feedback. The remaining mistakes and inconsistencies are, of course, our own.

## Lesson plan

Learning Objectives		
<ul style="list-style-type: none"> <li>• Understanding the basic workings of satellite crop monitoring and commodity futures.</li> <li>• Understanding what financialisation is and reflecting upon it.</li> </ul>		
Transferable Skills Developed		
<ul style="list-style-type: none"> <li>• Presenting opinions in an articulate manner.</li> <li>• Engaging with the opinions of others in a respectful fashion.</li> <li>• Linking theoretical concepts with concrete economic realities.</li> </ul>		
Prior to session		
<p>Students should read and watch:</p> <ul style="list-style-type: none"> <li>• Article and video: <a href="#">Satellite Crop Monitoring</a></li> <li>• Video: <a href="#">What Are Commodity Futures?</a></li> </ul> <p>The instructor should prepare the PowerPoint slides and, if online, the breakout rooms for the group exercise.</p>		
Plan of Activities		
Duration	Instructor Activity	Student Activity
<b>15 min</b>	Present slides 2-8.	Take notes. Ask questions if possible.
<b>10 min</b>	Explain the discussion questions and break students into groups of 3 or 4 people: with the people sitting next to them in the classroom or in online breakout rooms (with slide 9 visible for the students).	Actively discuss the questions with each other, respectfully listen to others, make sure everyone gets to speak and contribute, and make notes of key takeaways from the discussion.
<b>5 min</b>	Ask a few groups to report back one takeaway to the rest of the class.	Listen to the takeaways of other groups. Share their own takeaway.
<b>Total: 30 min</b>		

## Student preparation work

To give students a rough idea of what satellite crop monitoring is, students need to read this short explainer article [Satellite Crop Monitoring](#) and watch the [video](#) by the National Science Foundation (NSF) shown at the bottom of the article.

To help students get a basic understanding of what commodity futures are, they are given this 2 minutes financial education YouTube video [What Are Commodity Futures?](#).

## Presentation by the instructor

The presentation by the instructor of 15 minutes consists of four parts.

First, the learning objectives of the lesson are briefly explained to help them understand what is expected of them and what to focus on (slide 2).

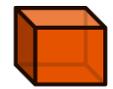
Second, students are shortly introduced to modern farming with a few examples of recent technologies and a recap of the article and video on what satellite crop monitoring is (slides 3-4). A key element is that satellites make pictures that observe much more than just the light and colours visible for human eyes to see (in jargon: multiple bands across the electromagnetic spectrum). These pictures help analyse the vegetation, basically the leaf colours, to see how crops are doing (for example, have diseases or are ready for harvest).

Third, before presenting financialisation as a concept to the students, it is illustrated with aspects of the case at hand: the financial structures and performances of a key provider (slide 5), the financial uses of the technology (slide 6), and the financial trading of agricultural products (slide 7). Going through these real-world examples helps students to slowly grasp the concept.

By looking at a key provider, students learn how firms are sometimes founded, financed, and structured in the real world. Planet Labs makes daily images of the earth in order to monitor changes that are used in the context of agriculture, but also of forestry, drought, energy, infrastructure, and defense. One could mention that the company is legally registered as a public benefit corporation, meaning a for-profit company with a positive impact on society, workers, the community, and the environment.

When giving students a recap of the video explaining commodity futures, one could repeat the possible outcomes again where (1) if the price of the product is higher than the set price on the agreed date, the buyers make a relative profit as they can resell the products for the higher price applying that day; and (2) if the price is lower, the buyers make a loss as the products are worth less in the market that day than what they bought it for.

Fourth, financialisation as a concept is explained and an additional example is given to help students think of the concept in a different context (slide 8).



## Student exercise

The second half of the lesson is about getting students to actively discuss and reflect on the material. This is done by a 10-minute long discussion in small groups of 3 to 4 people and a 5-minute long reporting back to the whole class.

When explaining the exercise to students, one could give example answers to help students to start. For the question about societal impact, one could mention the opportunity costs of using human and material resources for building satellites for commodity futures trading. For the question about other cases of financialization, one could mention the following case related to digital art: The Bored Ape Yacht Club non-fungible tokens (NFTs) collection built and traded on the Ethereum blockchain (in total for more than US\$1 billion).