



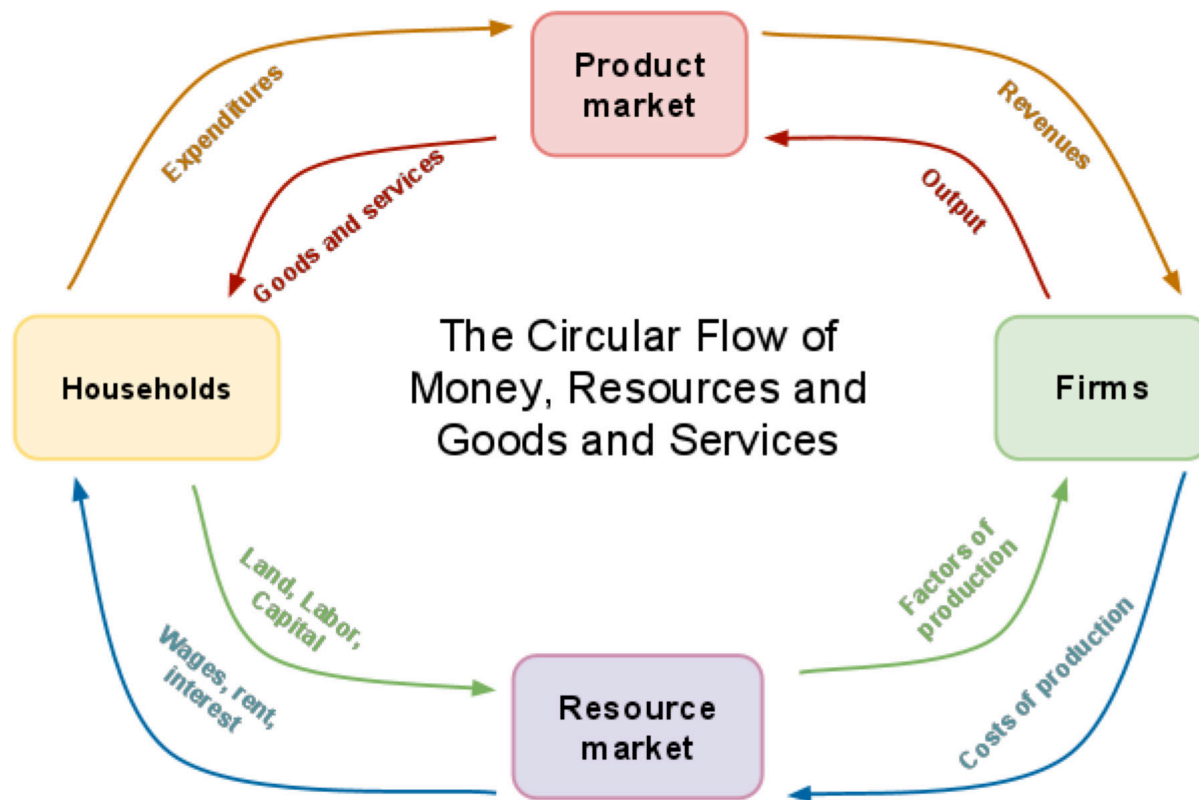
## Worksheet 11.1

### Circular Flow Simulation

Please note this is a class activity. Why not suggest it to your teacher?

**Objective:** To understand how productive resources, goods and services and money flow from households to firms and from firms to households through voluntary exchanges in a nation's product and resource markets.

**Introduction:** This lesson simulates the circular flow of resources, goods and services in a nation with a closed economy and no government sector. The simple circular flow model recreated through this simulation can be graphically represented as follows:



**Instructions:** The teacher will need to prepare several resources before beginning the simulation. These include:

1. **Money certificates:** These should be printed on green paper (perhaps four certificates per page), then cut into strips approximately the size of a dollar bill. I recommend four 'bills' from each sheet of paper. You'll need a paper cutter to quarter the photocopied sheets once they're printed. You



# Economics

should print at least 50 sheets of money, creating a total of 200 money certificates. On each certificate should be printed the words:

*This certificate is a money payment for a good or service or a productive resource. In the resource market it represents the wages, interest, rent and profits households receive as income for their resources. In the product market it represents the expenditures households make for goods and services.*

2. **Resource certificates:** On a different color sheet of paper, make approximately 40 copies of a page with the three resources on it, separated vertically: 'Land, Labor, Capital'. Each resource should be on its own strip of paper. Make sure you create the same number of each of the three resources. For a class of 20 students, I would recommend making at least 50 copies of each resource (50 lands, 50 capitals, 50 labors, so you have a total of 150 resources in total).
3. **Product certificates:** On yet a different color sheet of paper, print and make approximately 15 copies of a page with the words 'Goods and Services' on it four times from top to bottom, so you have a total of 60 'Goods and Services' certificates. Again, use the paper cutter to quarter the pages so you have 60 strips with the words 'Goods and Services' on them.

For a class of 20 students, you must create 20 different paper clipped bundles ahead of time. 10 of your students will be '**firms**' and 10 will be '**households**'. Each of the households will receive a bundle of resource certificates. Each firm will receive a bundle of money certificates.

1. 10 Household bundles: Prepare 10 bundles of resources. Each bundle can contain a random combination of land, capital, and labor. It is important that some households receive far more productive resources at the start of the simulation than others. For example, you may give one student a bundle with 5 labors, 7 capitals and 8 lands. Another student may receive a bundle with 2 labors, 1 land and 1 capital. This may seem 'unfair', but will play an important role in your post-simulation debrief. *Be sure to use ALL of the resources you printed out, so you are sure there is an even number of land, capital, and labor.*
2. 10 Firm bundles: Each firm is run by an entrepreneur. The entrepreneurs who manage each firm start with a different quantity of financial capital. Divide your 200 money certificates into 10 different bundles, some containing larger amounts of money than others. The 'average' entrepreneur will have 20 money certificates to start, but be sure to give some firms far more than this and other firms far less.

**The simulation:** For the simulation, you will need a large open space. I recommend going outside where there are some trees you can tape signs to, or in a gym or a classroom with the desks moved to the center of the room.

- Begin by asking students 'Who are the two 'stakeholders' in a nation's economy portrayed in the circular flow model?' Once they've identified 'Firms' and 'Households', have a volunteer tape two signs on walls opposite from one another in your teaching area.



# Economics

- Next ask students to identify what it is that firms demand from households, and what it is that households demand from firms. Once they've identified 'Resources' and 'Products', have a volunteer tape the signs for 'Resource Market' and 'Product Market' opposite each other in your area. You now have four signs taped to the wall: 'Households' and 'Firms' are across from one another, and 'Resource Market' and 'Product Market' are across from one another.
- Next assign roles: Give each student a letter, either an 'H' or an 'F'. Half the class will become Households and will re-group at their sign, the other half of the class will become Firms and meet at their sign. Explain to the Firms that they are entrepreneurs who want to start a business that will produce a good or service. As entrepreneurs, they are putting their own creative ideas towards a business venture, but must acquire land, capital and labor in order to begin producing their good or service.
- Ask the Households what they want, and where they will get it. They'll say 'Products' and they'll get them in the 'Product Market'. Ask firms what they want and where they'll get them. They should say 'Resources' and they'll get them in the 'Resource Market'.
- Next discuss the motives of firms and households. The entrepreneurs and their firms are seeking to maximize profits in the Product Market, which they will do by minimizing their costs in the Resource Market. Therefore firms must try to acquire the land, labor and capital at the lowest cost possible and then sell their goods and services for the highest price possible. Households are seeking to maximize their incomes in the resource market in order to maximize their consumption of goods and services in the product market. Therefore households should try to sell their resources for the highest price possible and buy their products at the lowest price possible.
- Ask the students: 'Now we're ready to begin our circular flow, but something is missing. What is it?'. They will know right away that 'MONEY' is missing. At this time, distribute the different sized bundles of money to the entrepreneurs. **Make each entrepreneur count his or her money so it knows how much it started with. This way each firm will know whether it earns a profit or a loss during the simulation.**

**Time to FLOW! First comes the RESOURCE MARKET.** In order to produce one product, business owners must acquire three resources: one land, one capital and one labor. Make sure they know that they must have one of each to produce one good or service, so that firms do not go out and buy nothing but labor or nothing but capital.

- The firms and the households must now meet in the resource market.
- Give the firms five minutes to bargain for and acquire as many resources as they can from household with their limited financial capital.
- Encourage firms to 'shop around' until they find a household willing to sell its resources for the lowest cost, or until households find a firm offering the highest income.
- Once a firm runs out of money, have the entrepreneur come to the 'FACTORY' (this is you, the teacher) where the firm will exchange the resources it acquired in the resource market for 'Goods



# Economics

and Services' certificates. Remember, one product (G&S certificate) costs three resource certificate, one of each of Land, Labor and Capital.

- After 5 minutes the resource market is closed and firms must report to the teacher's 'factory' to turn their newly acquired resources into Goods and Services. Give each entrepreneur one 'G&S certificate' for each bundle of land, labor and capital the entrepreneur acquired in the resource market. Households should return to their sign and count their money incomes and drool in anticipation as the firms produce their goods and services. Any resources unsold by households or unused by firms must be put aside, these may not be exchanged in the product market.

## Time for the PRODUCT MARKET.

- Remind the households what their motive is in the product market: to acquire the MOST goods and services possible, therefore spend all their money but try to get the lowest price possible.
- Remind firms what their motive is. EARN A PROFIT! To do this they must now sell their products at the highest price possible.
- Give the students five minutes to buy and sell goods and services. Encourage the households to 'shop around' for bargains. Observe what prices products are selling for between different buyers and sellers.
- At the end of five minutes, the product market is closed. Send firms back to their sign and households back to their sign.

## Analyzing the results:

- First ask the firms to count their earnings. Determine which firms earned profits and which firms earned losses.
- Determine how many resources went unsold in the resource market or were bought by firms and then were unable to be used to produce goods and services.
- Determine how many goods and services went unsold in the product market. If all goods and services were sold, then determine how much money households had left over and were unable to spend.

**Simulation debrief – Economic concepts to discuss:** The following are just some of the economic concepts that you can discuss following your circular flow simulation. There may be others, but these are some of the most interesting and important.

- **The Circular Flow:** Ask students what, exactly, was 'flowing' in the circular flow.
  - *Resources* flowed from households to firms, were turned into goods and services, which then flowed from firms to households.
  - *Money* flowed in the opposite direction; first from households to firms in the form of Wages, Interest, Rent and Profit (the income payments for the four resources households owned), then



# Economics

from households to firms in the form of expenditures on goods and services, which translate to revenues from firms.

- **Efficiency and the PPC:** Were there resources that households had in the beginning but were unable to sell in the resource market or resources that firms bought but were unable to use? The existence of unused resources is evidence that our ‘economy’ was producing below its PPC.
  - Discuss with the class how the ‘unemployed or underemployed resources’ represent an ‘excess supply’ of productive capacity in the economy. The existence of unused resources is evidence that the price in the resource market was too high! If the price had been lower, then firms would have demanded a greater quantity of resources and this ‘excess supply’ would have been eliminated.
  - The unused resources represent the inefficiency of the nation’s economy. If the market had been more efficient, then more resources would have been employed by firms and more goods and services could have been produced, meaning the economy would have been producing closer to its PPC.
  - Households with unemployed resources represent unemployment in the economy. There were mismatches in the resource market between firms and households, and the prevailing income level was too high, resulting in an excess supply of resources, i.e. *asurplus of land, labor and capital*.
- **Equilibrium price in the product market:** It is possible that following the product market round, some households will have money left to spend yet firms will be sold out of goods and services. This is evidence that the price goods were going for was too low.
  - If households were willing and able to buy, but there was not enough product to sell, then we had excess demand in the product market. The quantity demanded exceeded the quantity supplied.
  - The price in the product market was too low. A price below equilibrium leads to shortages. If firms had known there would be households willing to buy, then they would have charged a higher price and the shortage would have been eliminated.
- **Inequalities in the distribution of income:** Ask students why some households ended up with more goods and services in the end than others? Also, why did some firms end up with greater revenues than others?
  - Some households had higher incomes and thus enjoyed greater levels of consumption because *they were endowed with higher quality and a greater quantity of resources to begin with*. This is representative of the real world in which not all households have the same education levels, own the same amount of land or have the same amount of financial capital as others. Those with the greatest quality and quantity of resources earn higher incomes in the form of wages, rent and interest and therefore enjoy a higher level of consumption.
  - Some firms ended up with higher revenues than others, which is probably because they started with greater financial capital. The entrepreneurs with access to more financial capital when starting their business were able to produce more products and earn higher revenues. But an



# Economics

entrepreneur's having access to more money in the beginning did not guarantee he or she would earn profits! It's likely that even the smallest firms were able to earn profits, if they were good at negotiating their costs down and their prices up.

- **Competition and 'creative destruction':** Some firms will make losses while others make profits.
  - Firms that earn big losses will be forced to shut down or become smaller, because they'll be unable to buy as many resources nor produce as much output in the next round of the circular flow.
  - Firms that earn larger profits will be able to expand and grow since they can reinvest their profits into more inputs and greater output in the future.
  - Competition forces firms to be as efficient as possible. Only firms that produce in the *lowest cost manner* can survive in a market economy. This is good because it assures that resources will not be wasted and output will be maximized as firms pursue their ultimate motive of profit maximization. I call this *Economic Darwinism*: 'survival of the most efficient', a key characteristic of market economies.

**Other possible questions for discussion:** The following questions can be distributed to students following the simulation and assigned as a reflection for the next class period, or put on the board and discussed as a class.

1. What, exactly, 'flows' in the circular flow?
2. How is money spent by firms in one market end up being earned by firms in the other market?
3. What are the objectives of firms and households in a market economy?
4. Why did some households end up with more goods and services than others? Why did some firms end up with higher revenues or profits than others?
5. What role does self-interest play in a market economy?
6. What role does money play in the a market economy?
7. What would happen to the prices of resources and products if in the next round the amount of money firms started with doubled? What would happen if the amount of money were reduced by half?

**Final thoughts:** I have done this circular flow activity countless times with IB Econ students. Over the years it has evolved each time I've done it. I recommend you try it with your students and make small changes where you see they're needed. Throughout the IB course, however, I always find myself re-visiting our circular flow simulation in lectures, and students always recall immediately what I am referring to since they themselves were the households and firms engaging in voluntary exchanges motivated by their own pursuit of self-interest.