

Understanding the AD-AS Model: *Aggregate Demand-Aggregate Supply*

(actually it's AD-SRAS-LRAS)

It is the foundation of real-sector models of macroeconomics, including the Classical Theory and Keynesian Theory.

AD-AS Basics

In the AD-AS model, the economy's performance is plotted as a point. The point represents the current Price Level and the level of real output (Real GDP) the economy is experiencing.

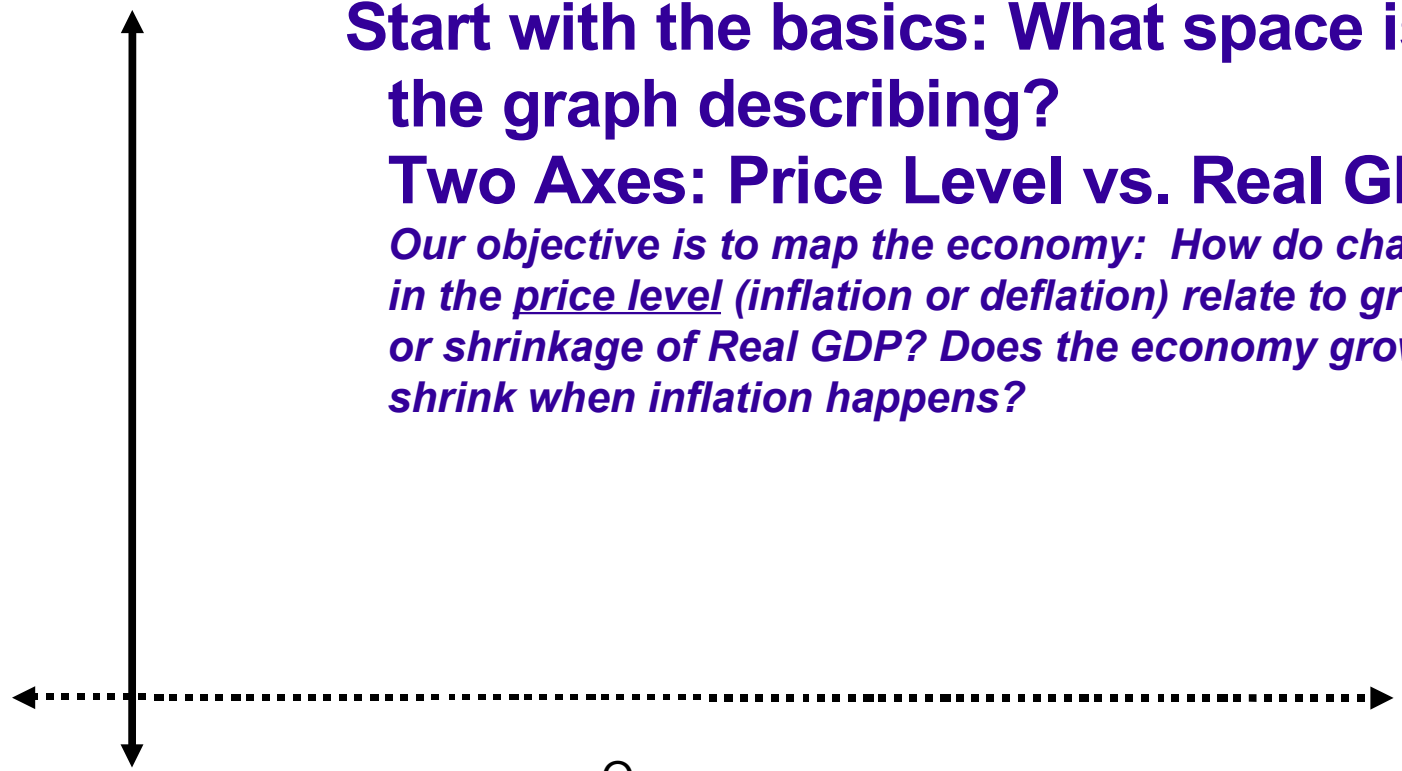
We will start by looking at the basics of the graph of the model -- what the axes represent and how changes in the economy are represented.

Start with the basics: What space is the graph describing?

Two Axes: Price Level vs. Real GDP

Our objective is to map the economy: How do changes in the price level (inflation or deflation) relate to growth or shrinkage of Real GDP? Does the economy grow or shrink when inflation happens?

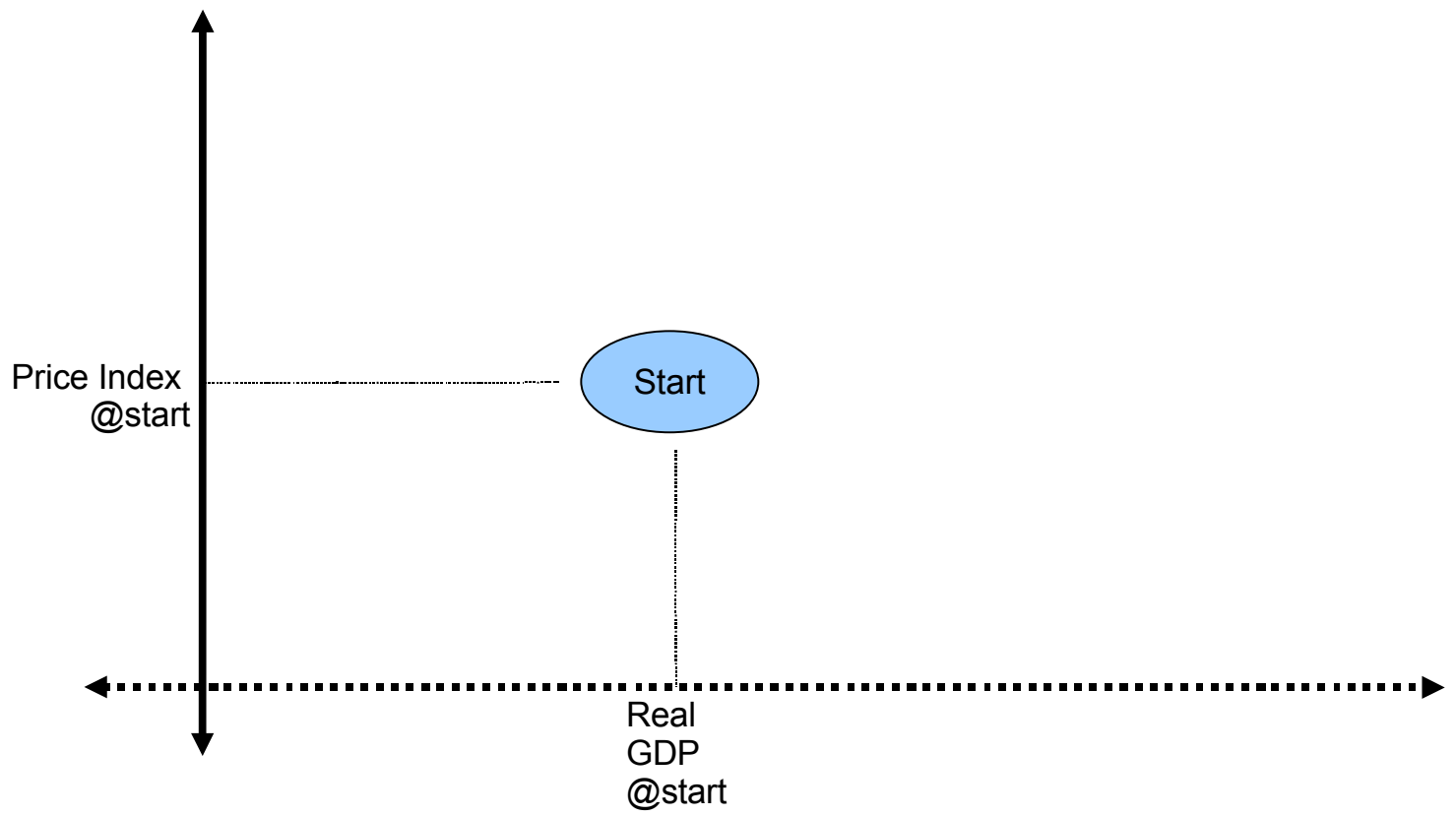
P
Price Level
(price index)



Q
Real Output
(amount of real goods & services produced)

Imagine the Economy is at some starting point.

P
Price Level
(price index)

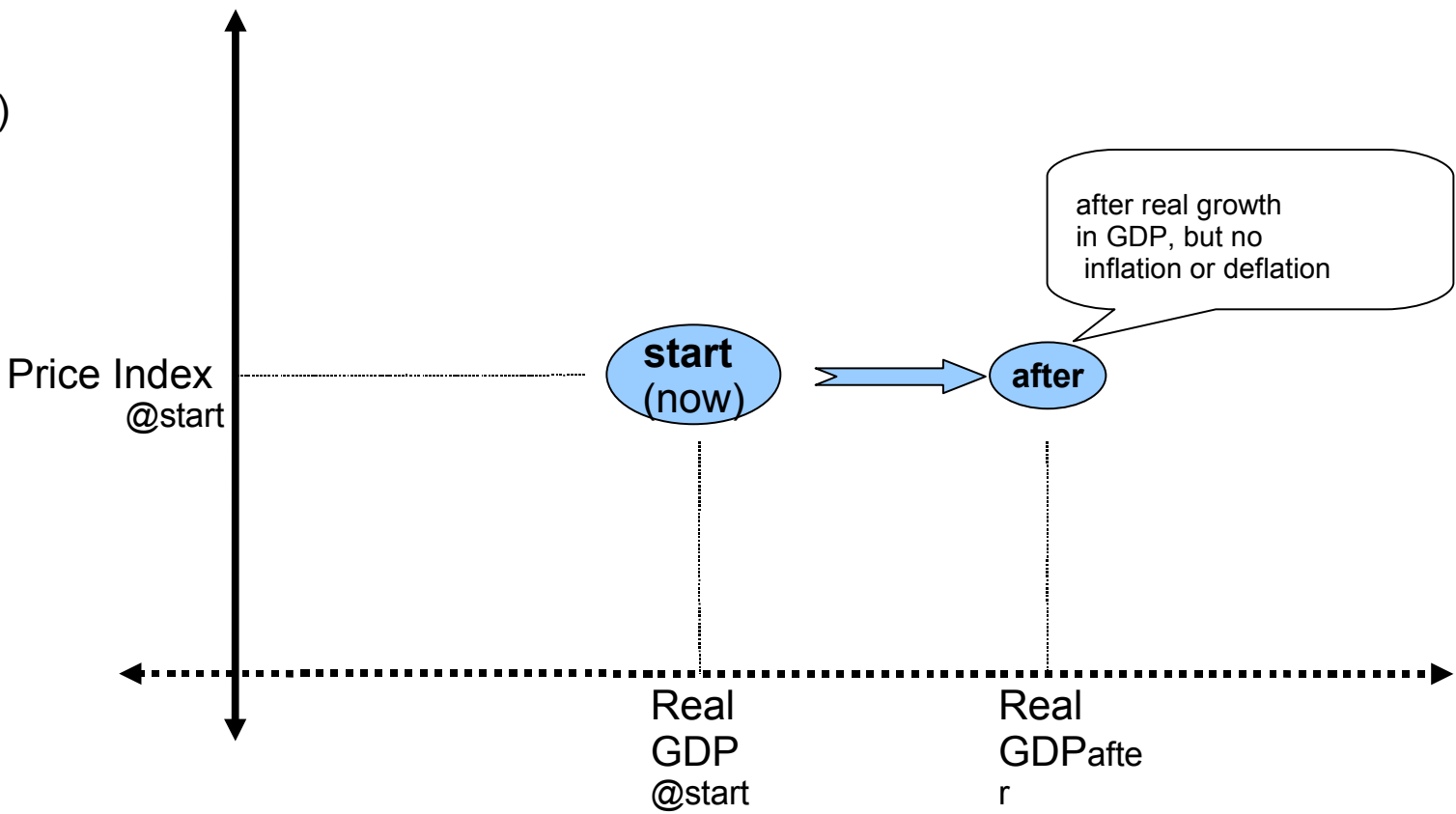


Q
Real Output
(amount of real goods & services produced)

Next, to check your understanding of the graph, let's examine some some changes to an economy and how it would show up on the graph.

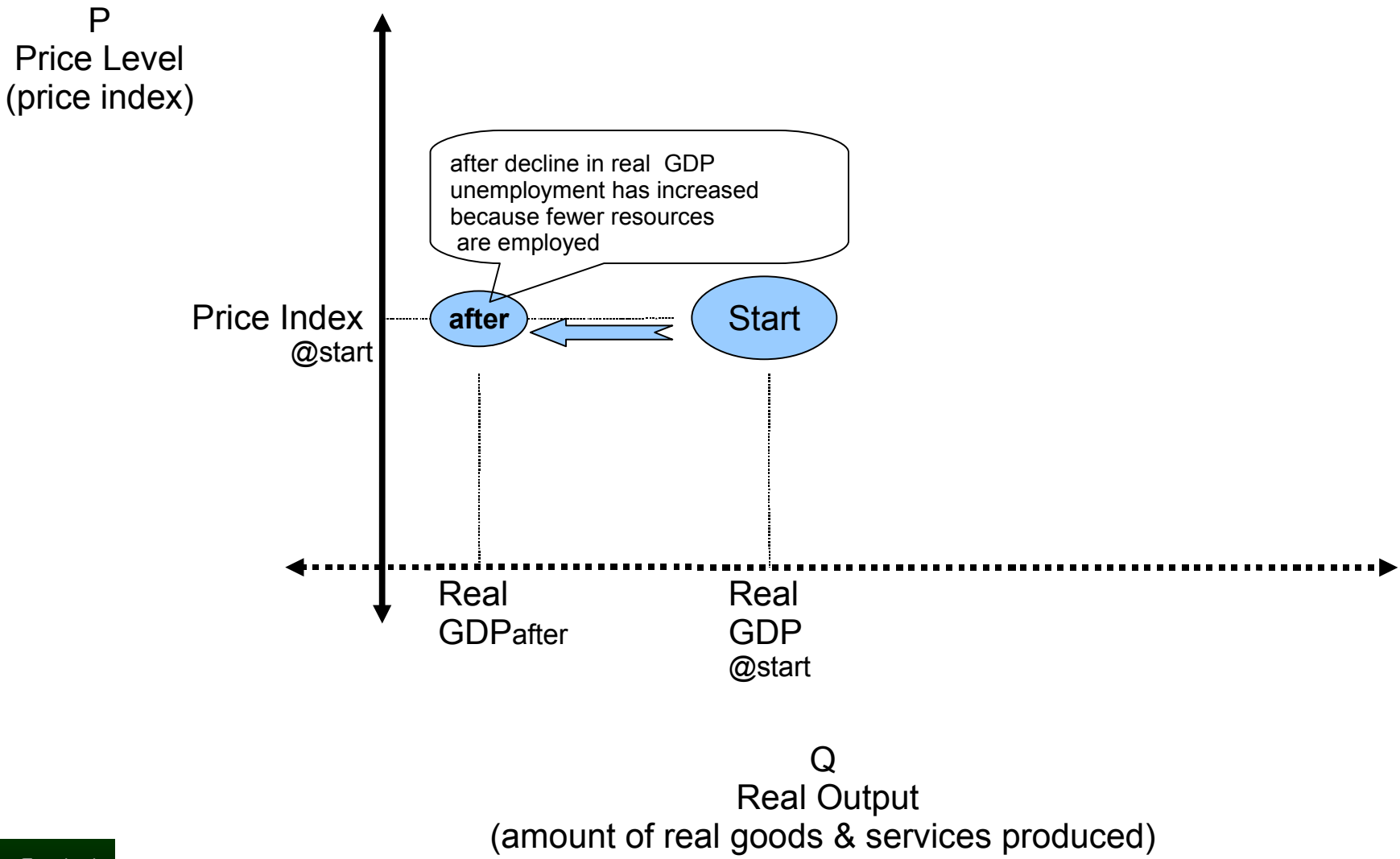
If Economy Grows, then it shifts right.

P
Price Level
(price index)

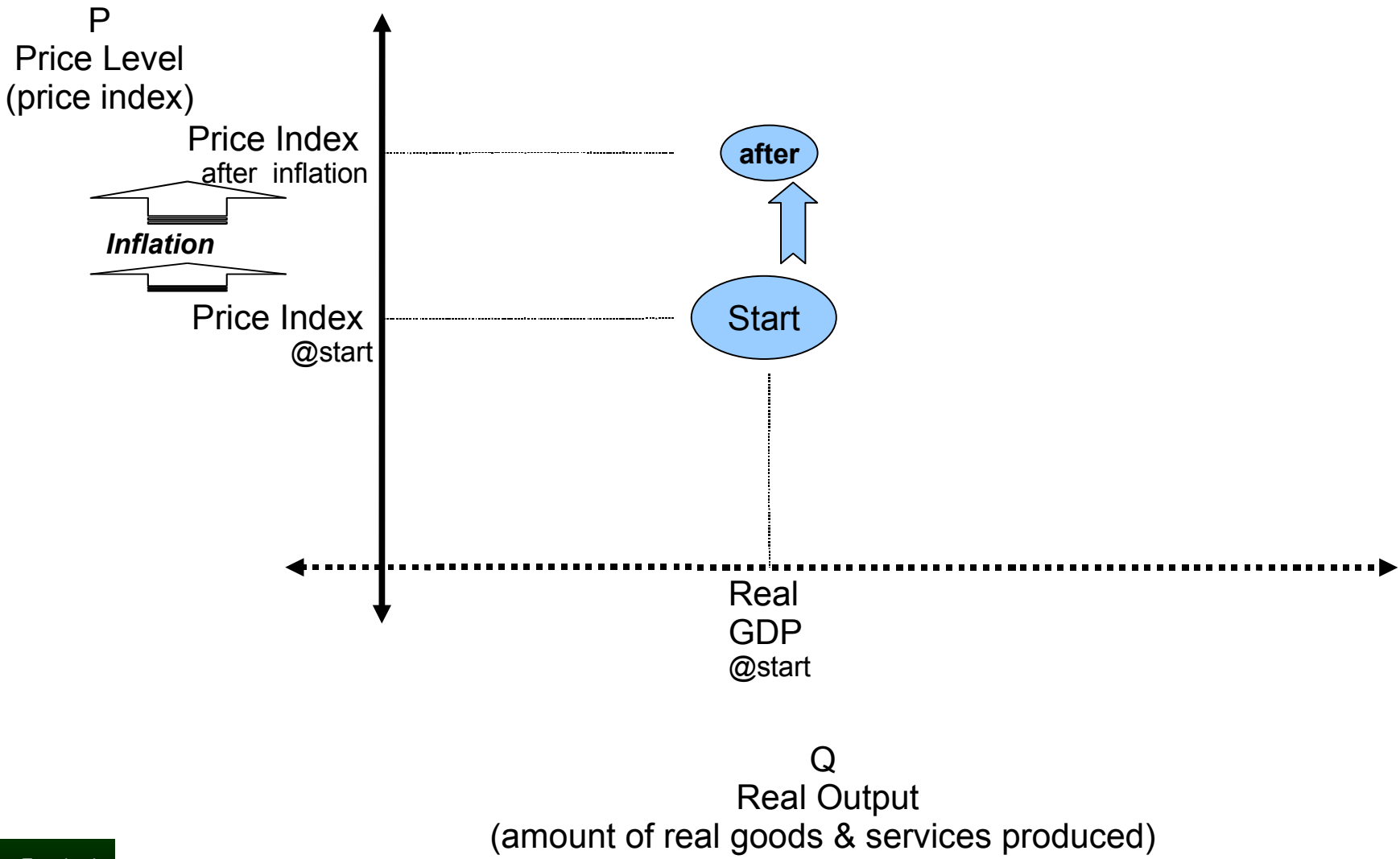


Q
Real Output
(amount of real goods & services produced)

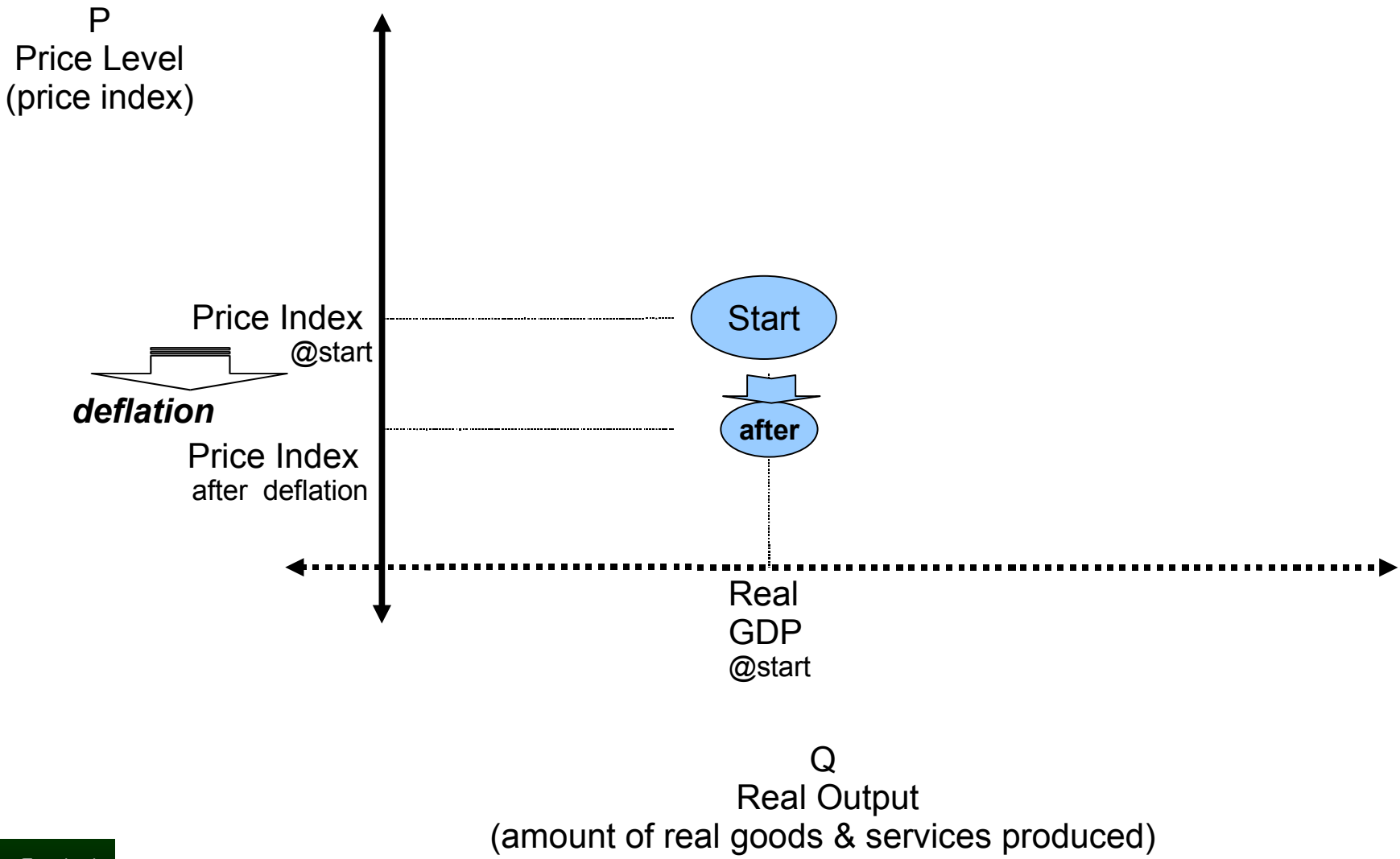
If economy shrinks (recession), it moves to left.



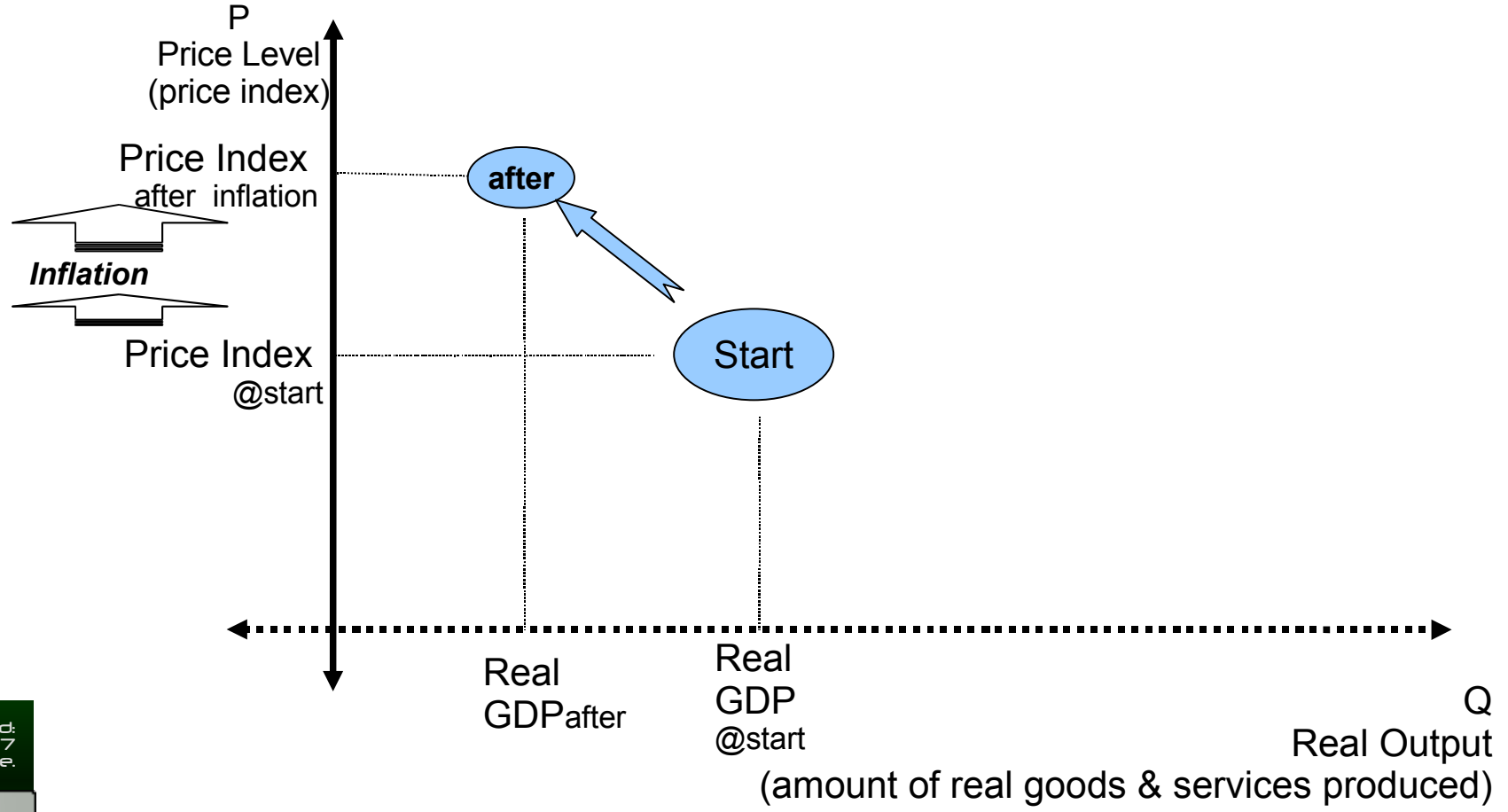
If the inflation happens, then the economy shifts to a point higher on graph.



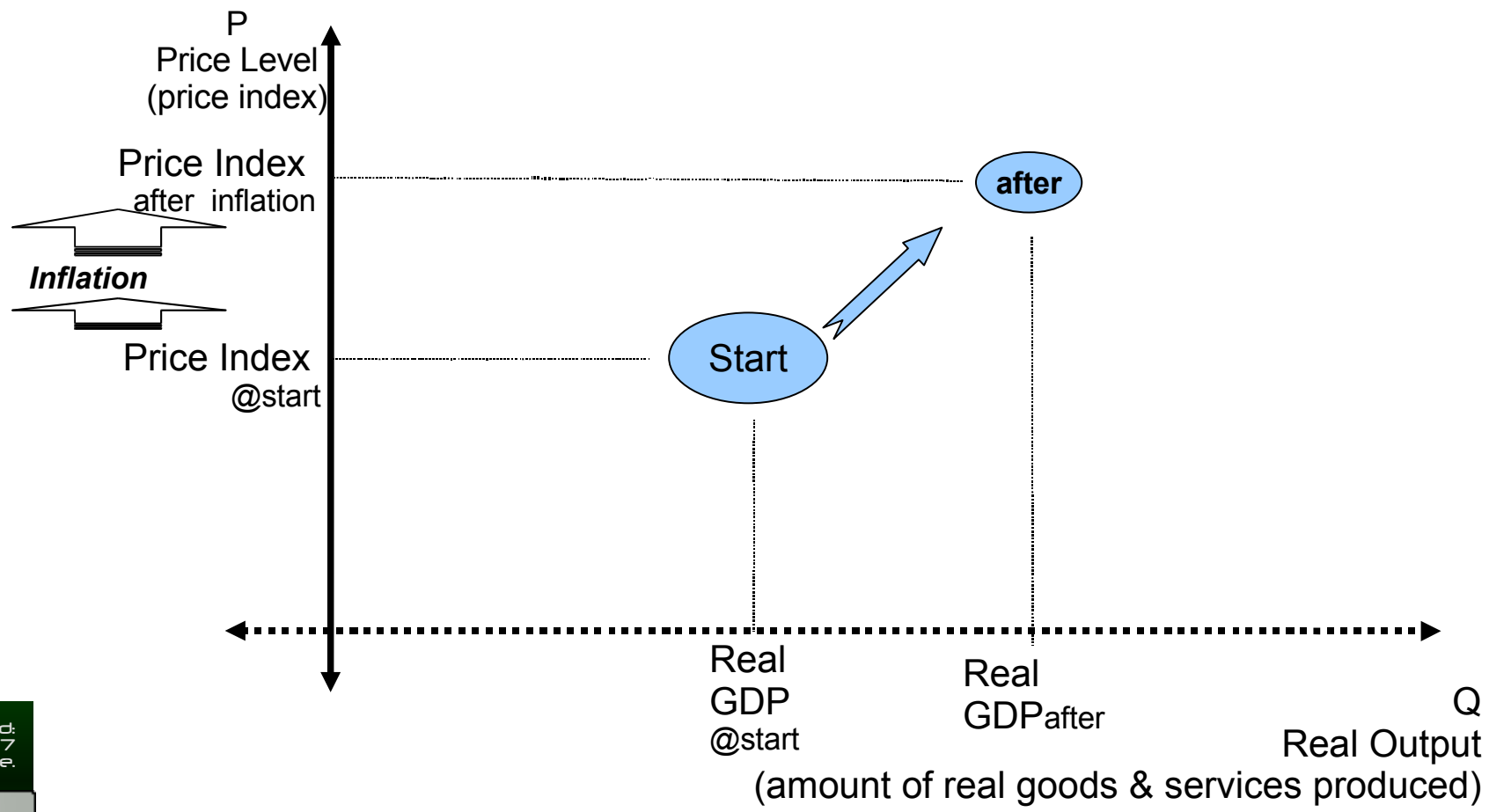
Deflation causes a shift downward.



Of course in real life, the both the price level and real GDP change at the same time. Now let's suppose there's a simultaneous change in both the price level (an increase) and real output (decrease in Real GDP) .



Suppose, though, that real output increases while the Price Level increases. The point representing the economy now moves to the right and up.



You can figure out what would happen in the other two possible cases:

- ◆ Price index decline w/ real GDP increase
 - the economy moves down and to the right*
- ◆ Price index decline w/ real GDP decrease
 - the economy moves down and to the left*

Relating Price Level to Real GDP

Now we consider how people react to changes in the price level. In other words we want to identify how:

- The demand for real goods changes when price level changes. In other words, how does demand for goods respond to inflation/deflation. This is called **Aggregate Demand (AD)**.
- The supply of goods and labor changes when price level changes. This is called **Short-Run Aggregate Supply (SRAS)**.

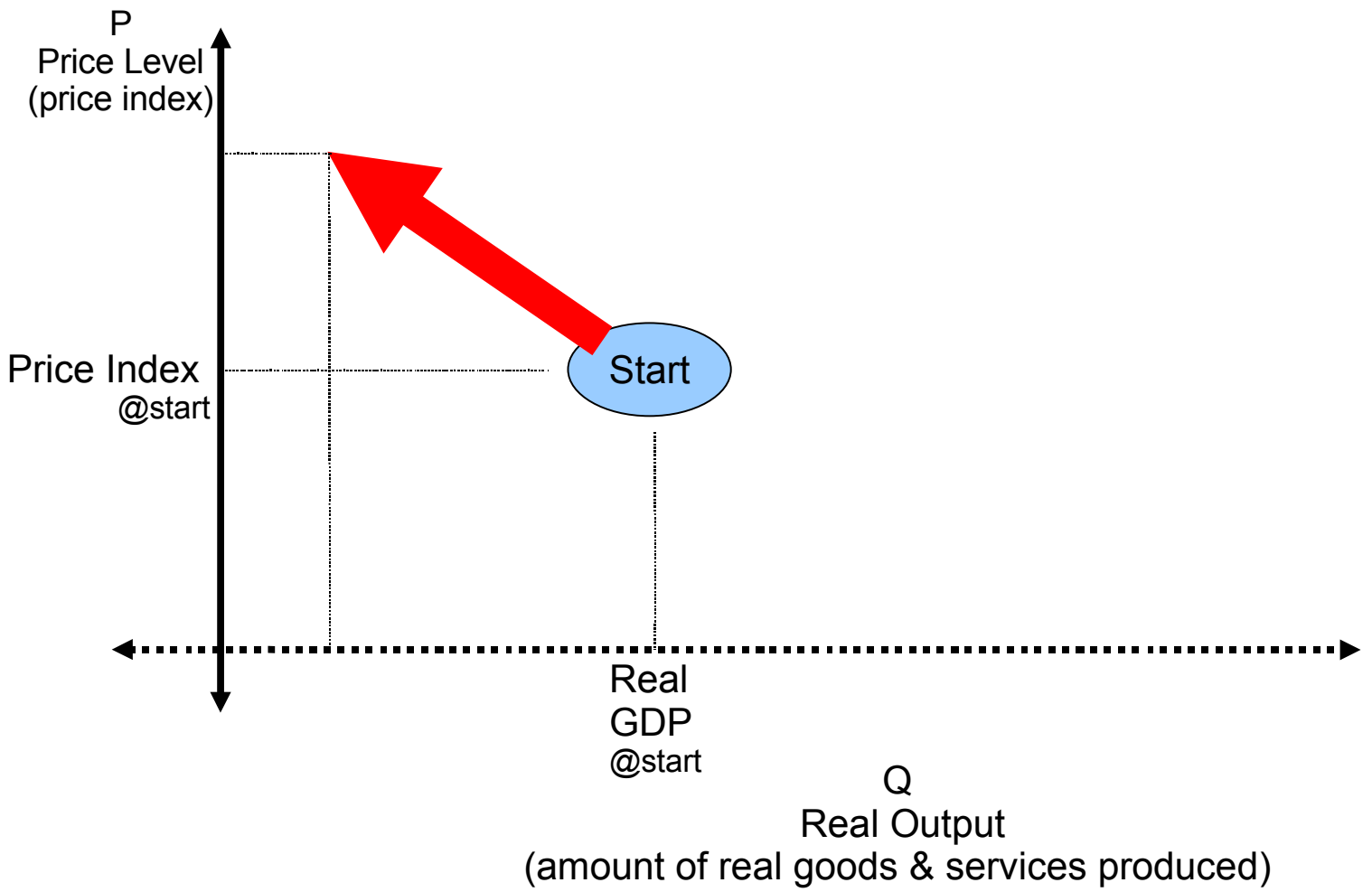
Consider Aggregate Demand

Aggregate Demand (AD) is shows that Real GDP is inversely related to Price Level. In other words, when Price Level goes up, real GDP demanded by people goes down. Why?

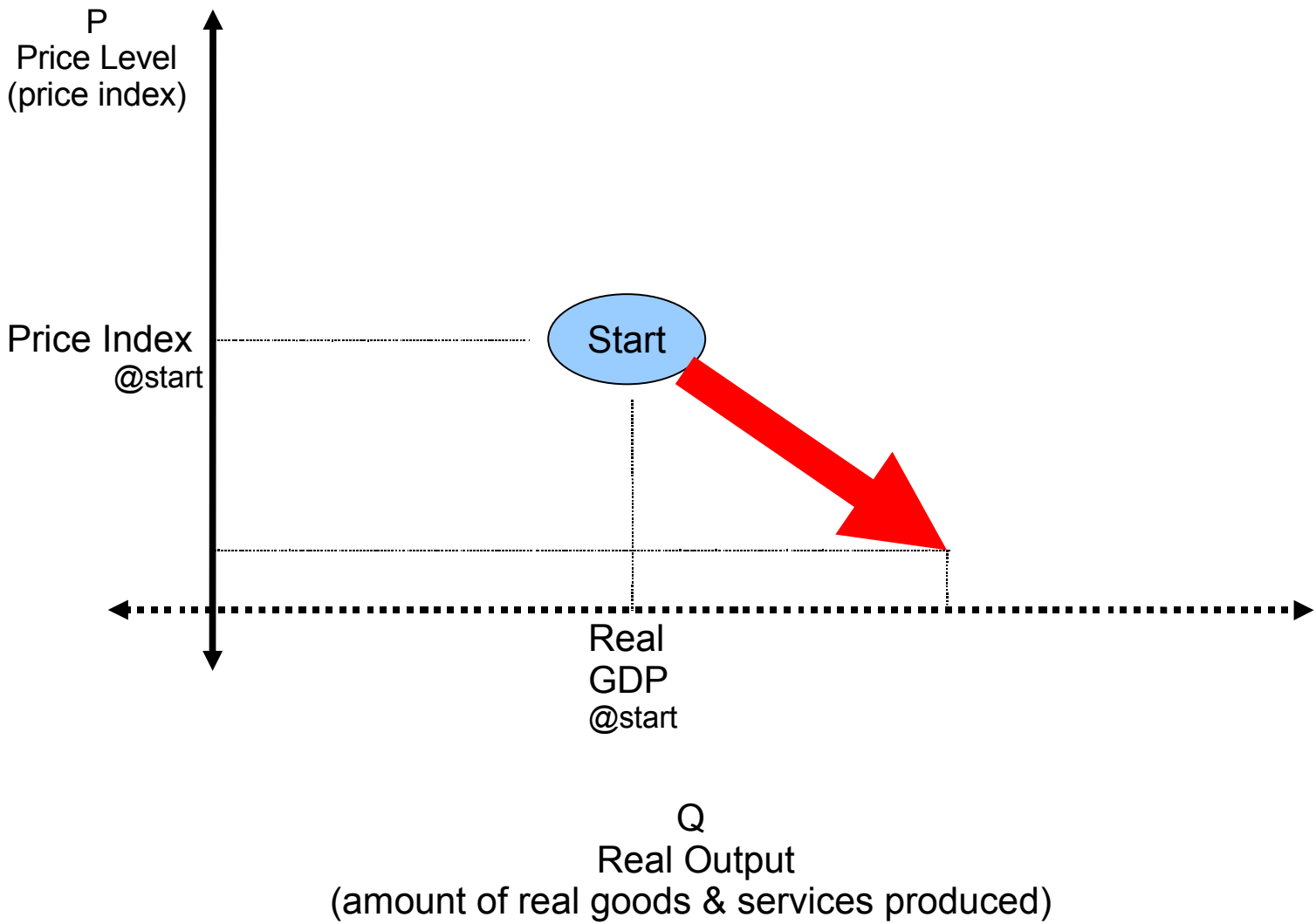
- **Wealth Effect:** most consumption spending is done from income – money earned from selling labor. When inflation happens, the price of labor goes up also, allowing people to keep buying the same amount of real goods. But some people finance their consumption by spending their wealth (paying out of their savings account or pension). These incomes stay fixed inflation, forcing people to buy fewer real goods.
- **Interest Rate Effect:** inflation causes interest rates to increase, which causes firms to borrow less and spend less on investment.
- **Int'l. Trade Effect:** Higher prices for domestic goods (the inflation) causes imports to be more relatively attractive and exports less attractive. $X-M$ decreases, reducing real GDP.

Now let's look at this in the graph.....

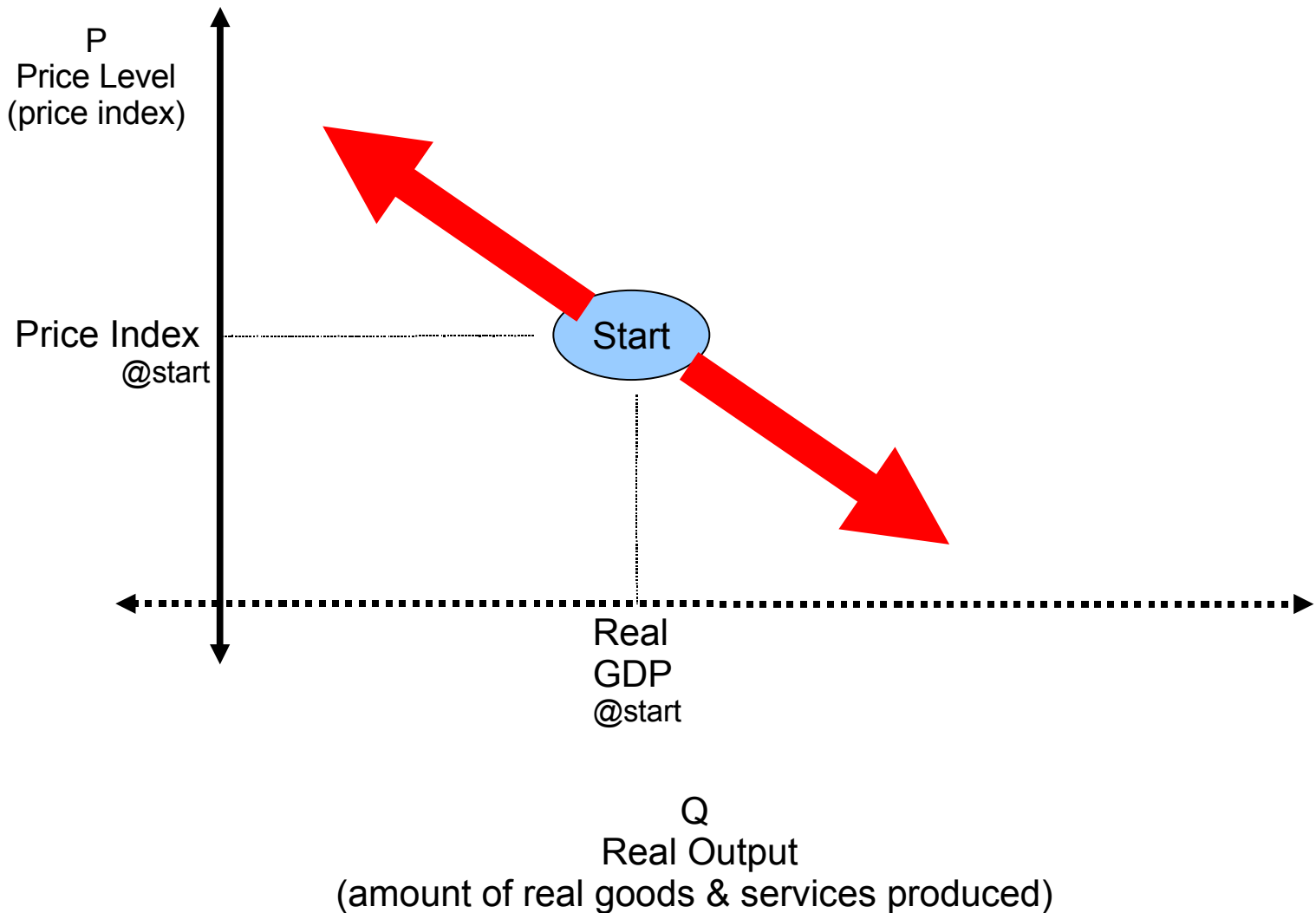
Consider Demand for Real Goods: If inflation happens, then some people cannot buy as many goods (because of wealth effect, interest rate effect, & int'l trade effects)



Similarly, Deflation (lower prices of everything) allows people to buy more real goods.



This relationship between Price Level and Real GDP that people can afford to buy is called *Aggregate Demand*, or the *AD Curve*: Demand for real goods responds to inflation/deflation by moving in these directions

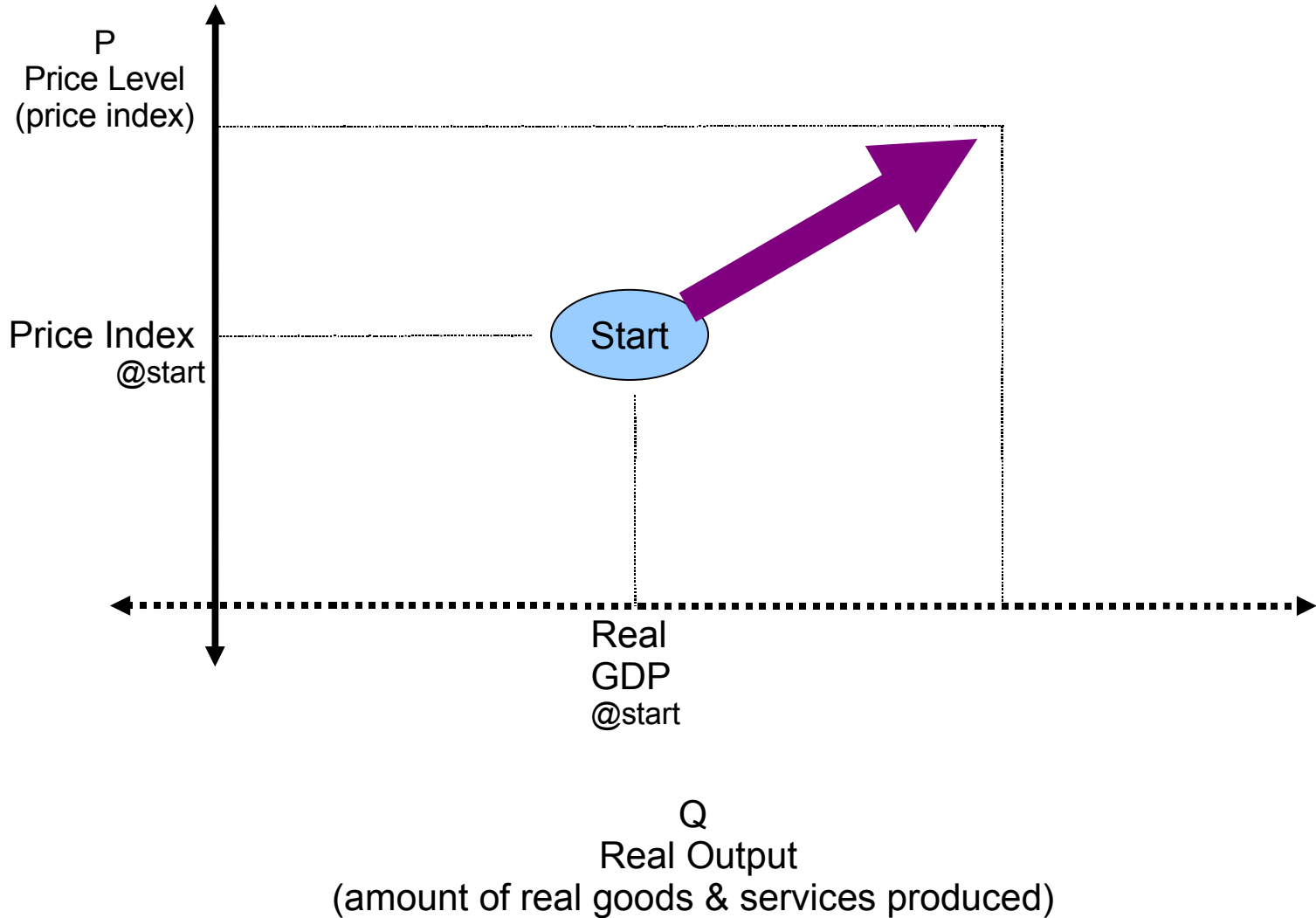


Now let's look at producers.

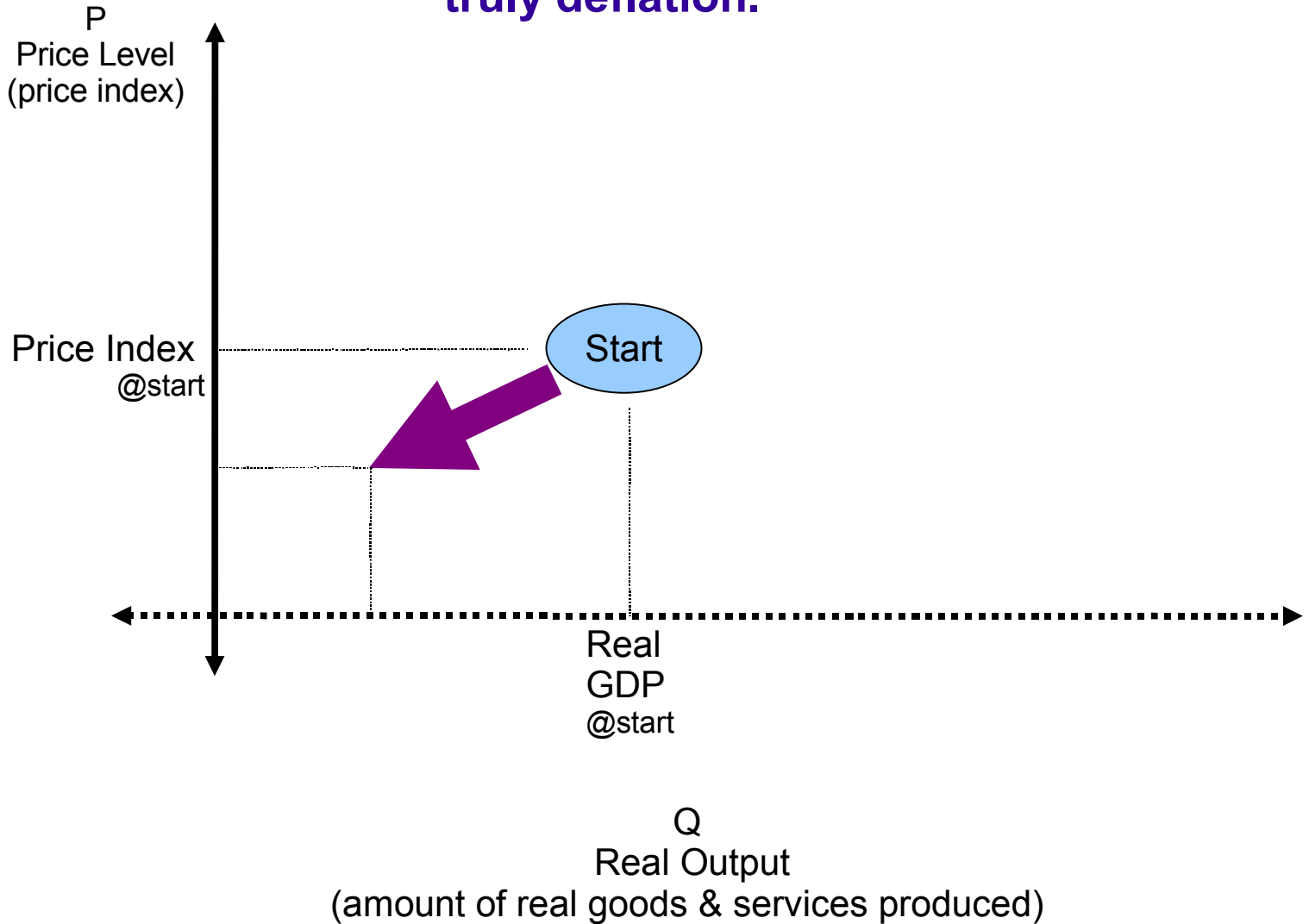
Now consider producers, both firms making products and households deciding to sell labor. In the short-run, when inflation happens (price level rises) producers get “fooled”. They see that the price of their product or labor has increased. They believe this to be a real price increase for their product or service relative to other goods. What they don't see immediately, is that all goods are going up in price. Believing it is real price increase, they are willing to produce and sell more real goods.

But, in reality all prices have higher prices, including the inputs (costs) for the firm and the goods the worker hopes to buy. In the short-run, this means that a rise in all prices (inflation) can initially cause producers to offer more goods/services for sale. We call this short-run relationship **SRAS**, or *Short-Run Aggregate Supply*.

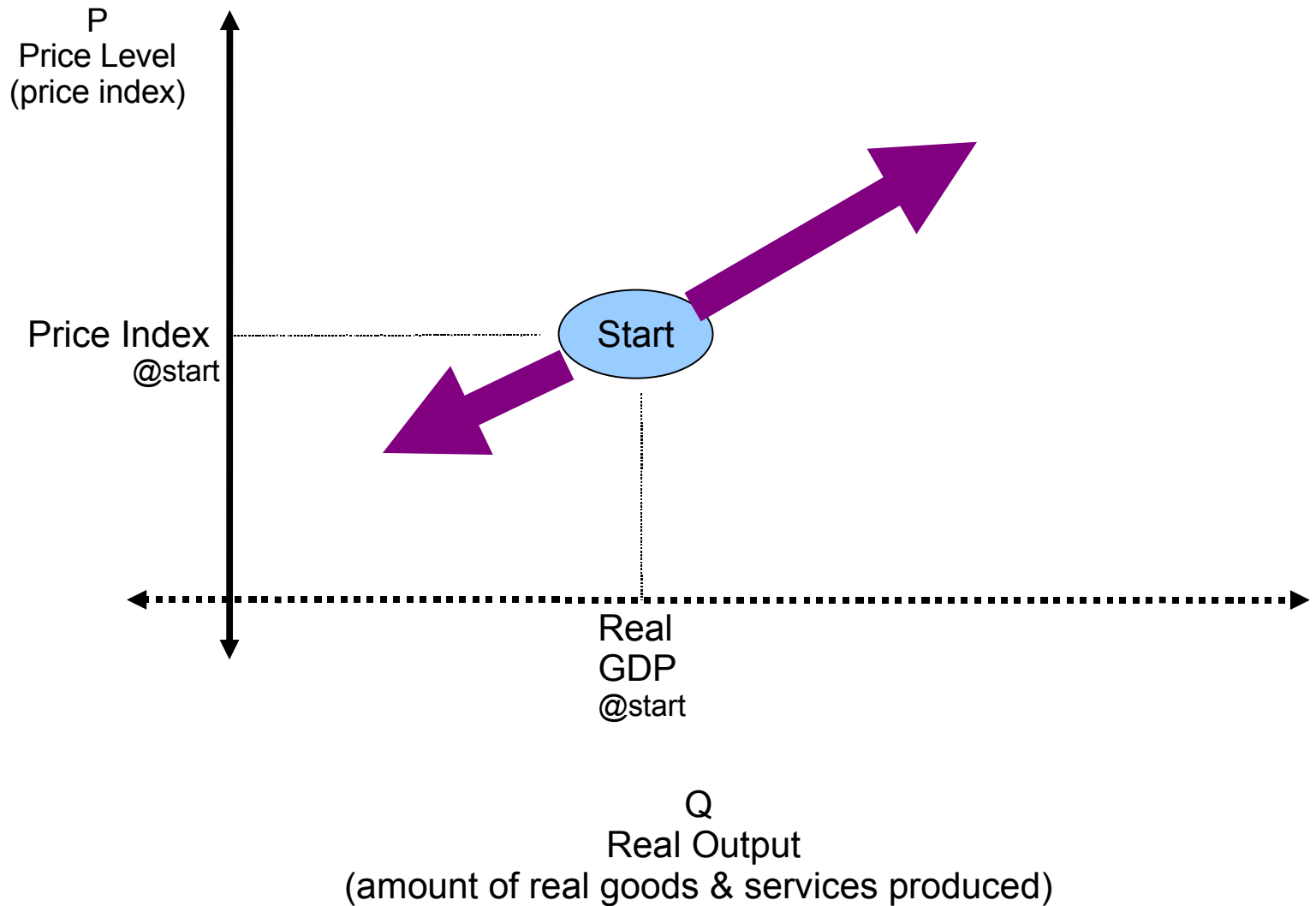
SRAS: Consider a producer. When the price of product increases, firm wants to supply (sell) more product. Firm doesn't realize that all prices have increased (inflation).



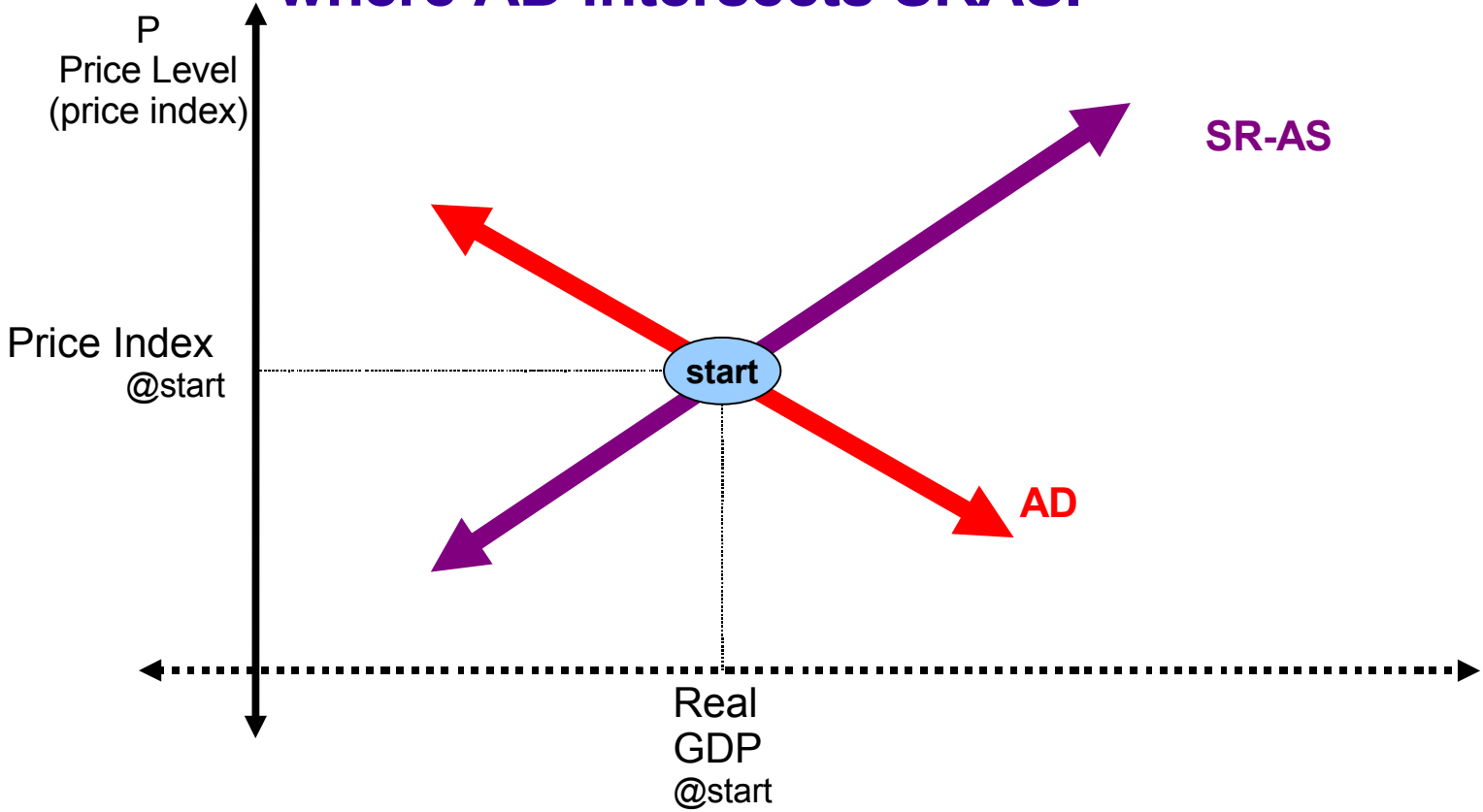
When firms' price goes down, firm is willing to sell less, thinking it less profitable. They don't realize costs are also declining if it is truly deflation.



Thus we have the SRAS curve. It shows the short-run reaction by firms & workers to inflation/deflation. They will initially offer to sell more/less real goods in short-run.



A Short-Run Equilibrium exists when offers to sell equal offers to buy: *Purchases = Sales*. In other words, a short-run equilibrium exists where AD intersects SRAS.



In the short-run, the economy must always be where $SRAS=AD$. This is because the quantity of Real GDP we buy must equal the amount we sell.

Next: Shifts in the AD curve

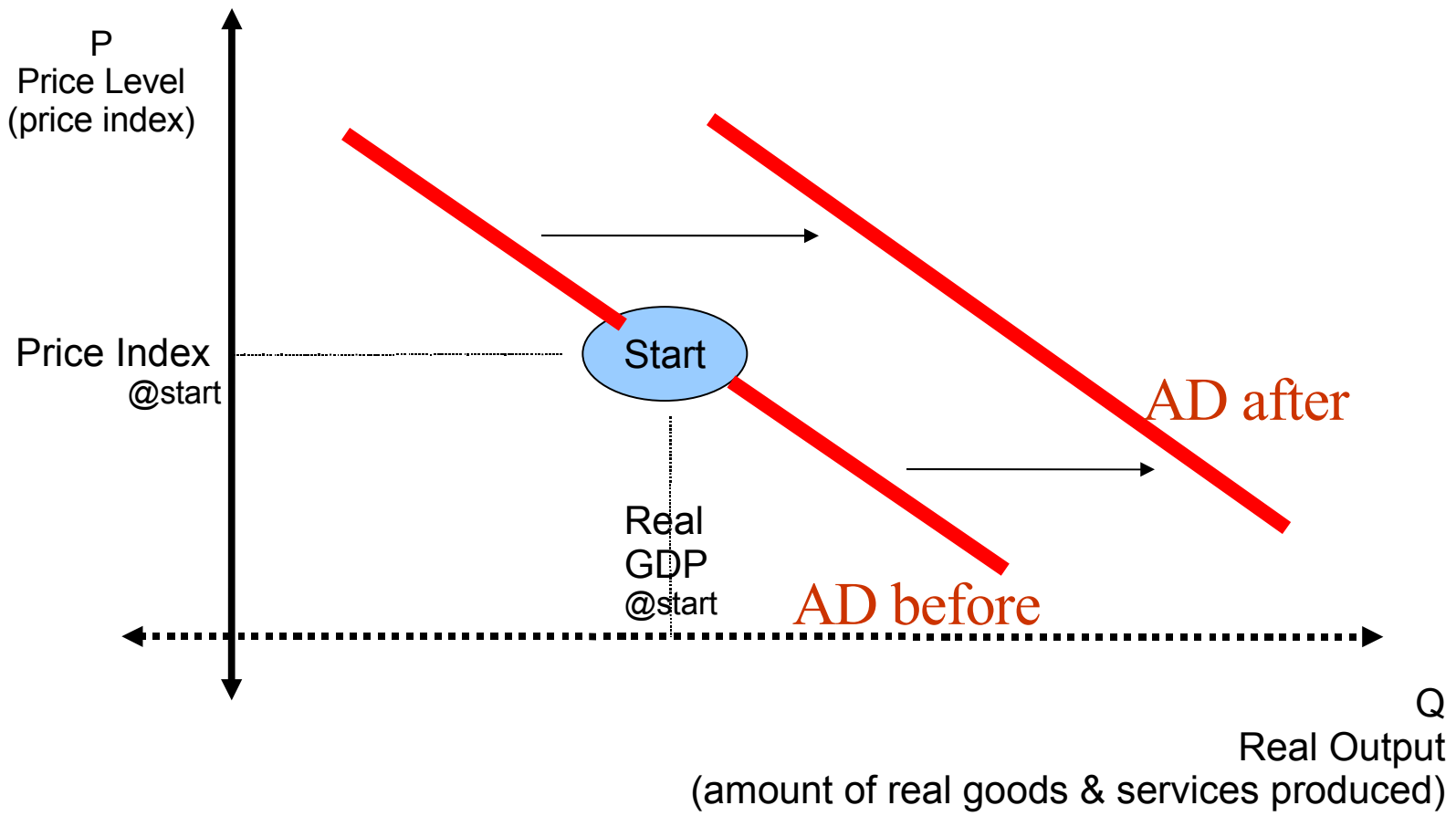
The AD and SRAS curves only show how Real GDP changes when only the Price Level goes up or down. Next, let's suppose factors *other than* the Price Level change. Other factors changing will *move* the curves to the right or to the left. Factors that shift AD are:

- Changes in people's expectations about future economic conditions. More optimism shifts right, more pessimism shifts left.
- *Economic growth in other countries* boosts demand exports.
- Government budget decisions to change T or G

This shift in AD could represent:

- increased optimism among households & firms
- increased government spending
- decreased taxes
- foreigners choosing to buy more exports

Reverse these changes and AD shifts the other way.



Next: Shifts in SRAS curve.

The SRAS curve only shows how Real GDP changes when the Price Level goes up or down. Next, let's suppose factors *other than* the Price Level change. Factors that cause SRAS to shift left or right are:

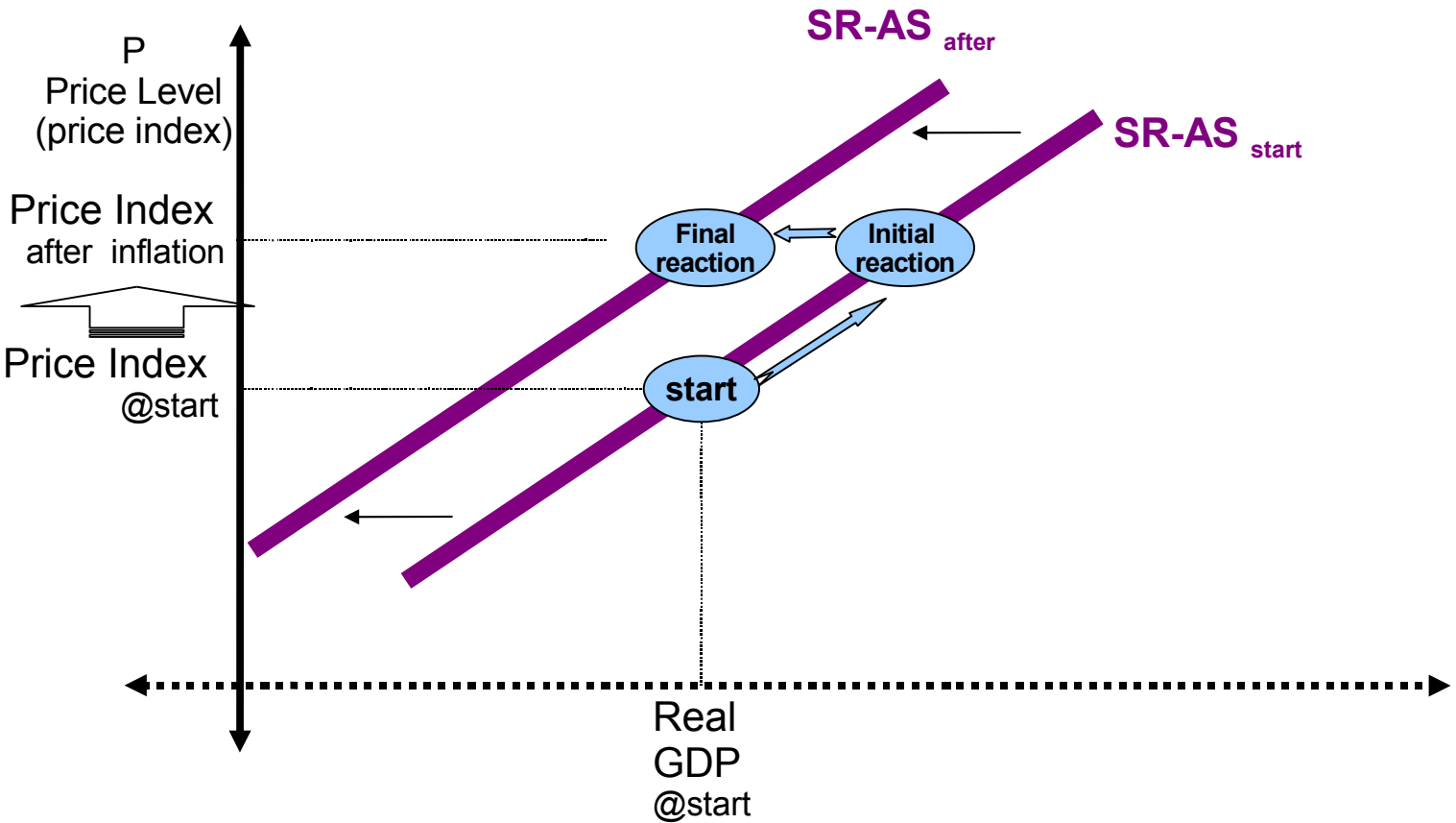
- Changes in expectations about future economic conditions.
- *Technology improves* resulting in better profitability.
- Cost increases: Firms realize that resource prices have risen but they cannot pass the increase on to customers.

Cost increases shift the SRAS curve.

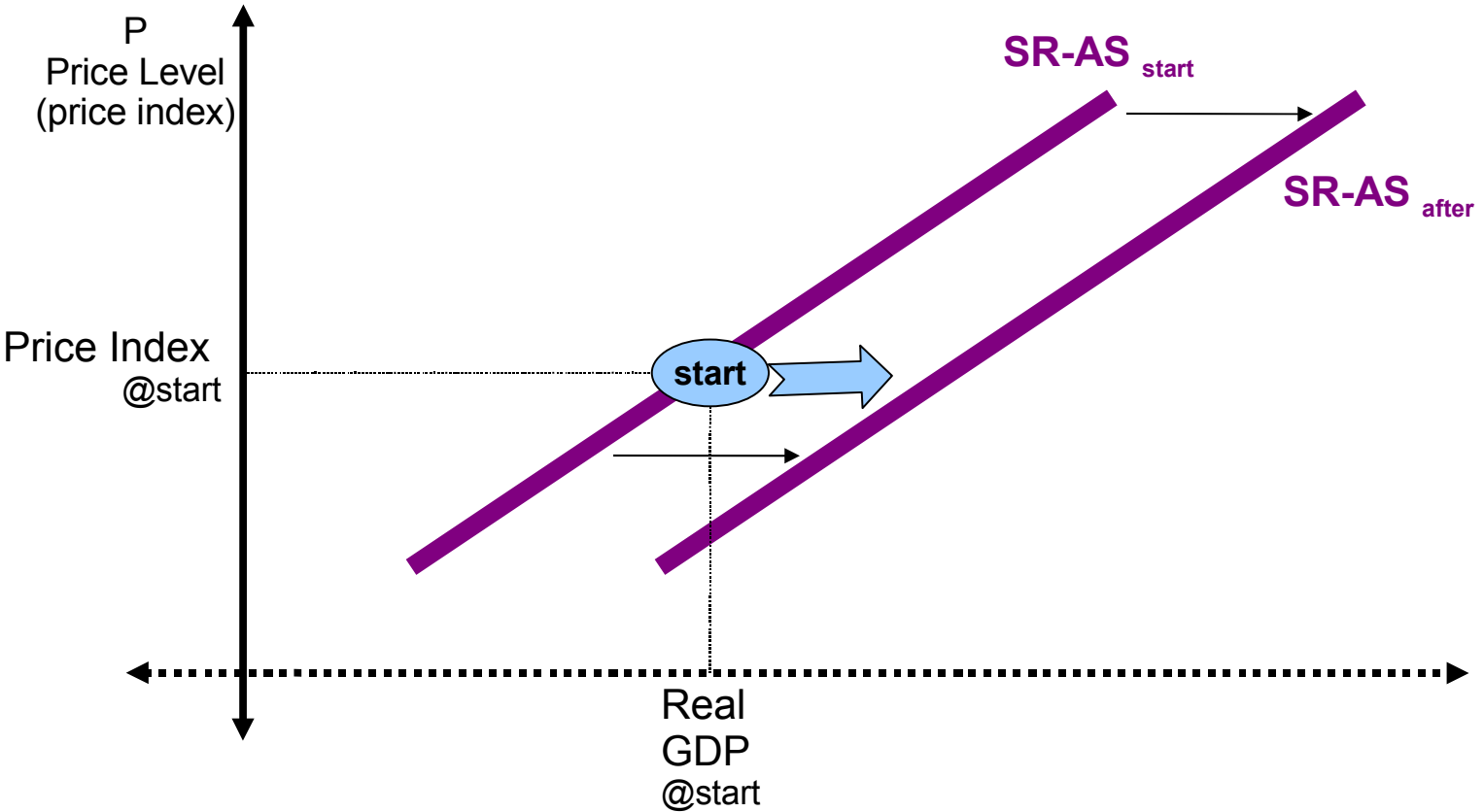
Earlier we said that SRAS is upward sloped because firms/workers get “fooled”. They see the price of what they are selling go up and respond by producing more – they move up the SRAS curve.

But this movement up the SRAS is only temporary. Once the firms realize that not only has their product price gone up, but the prices of all the inputs (resources) they are buying are also increasing, the firms respond by cutting back production the previous real quantities. Except now, the price level has increased. So this realization of higher costs shows up as a shift backward in the SRAS as shown on the next slide.

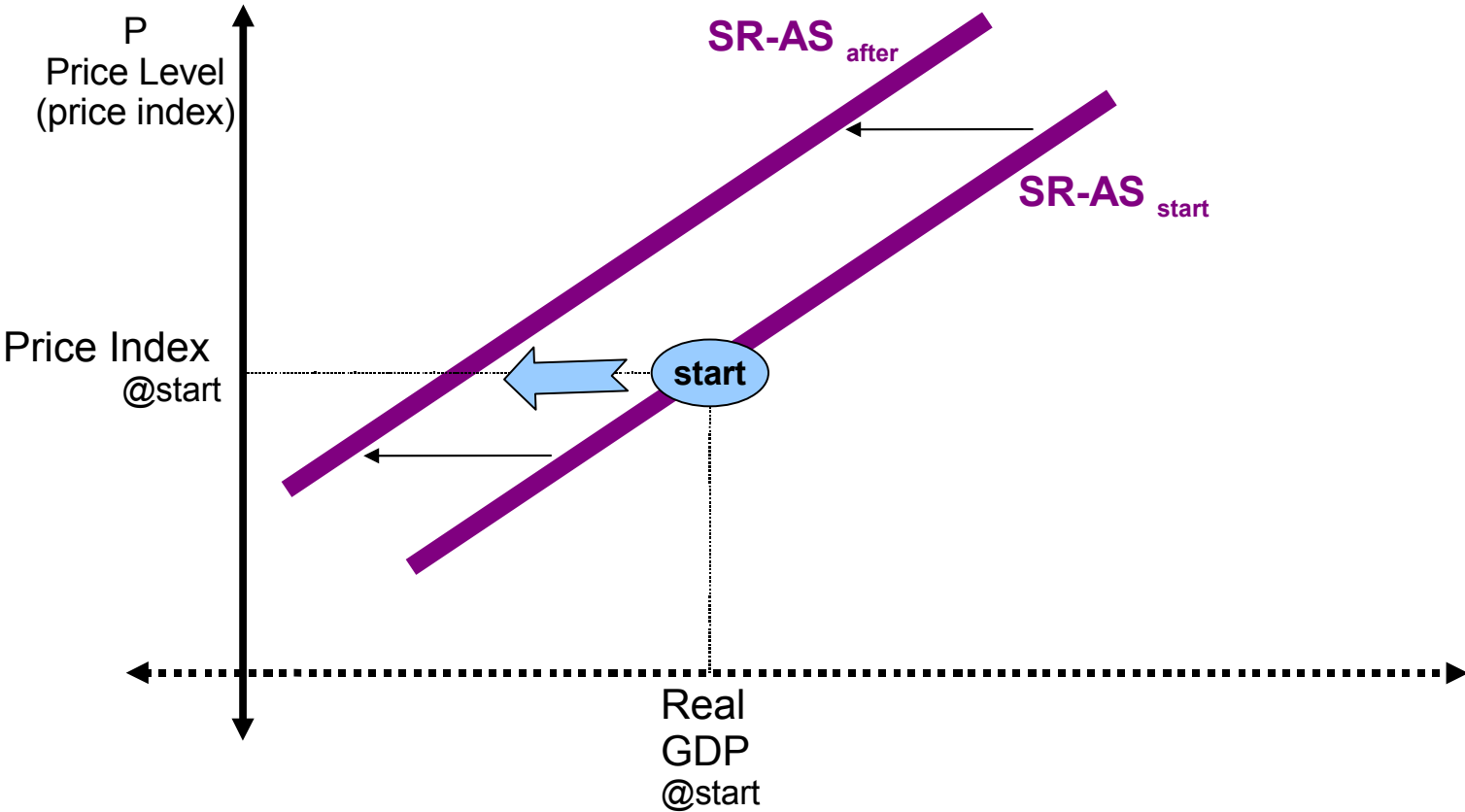
Firms reacting to realization that inflation has raised all prices, not just the price of their product.



Technology improvements can shift SRAS also.



External cost increases in critical resources, such as oil, can also shift the SRAS.



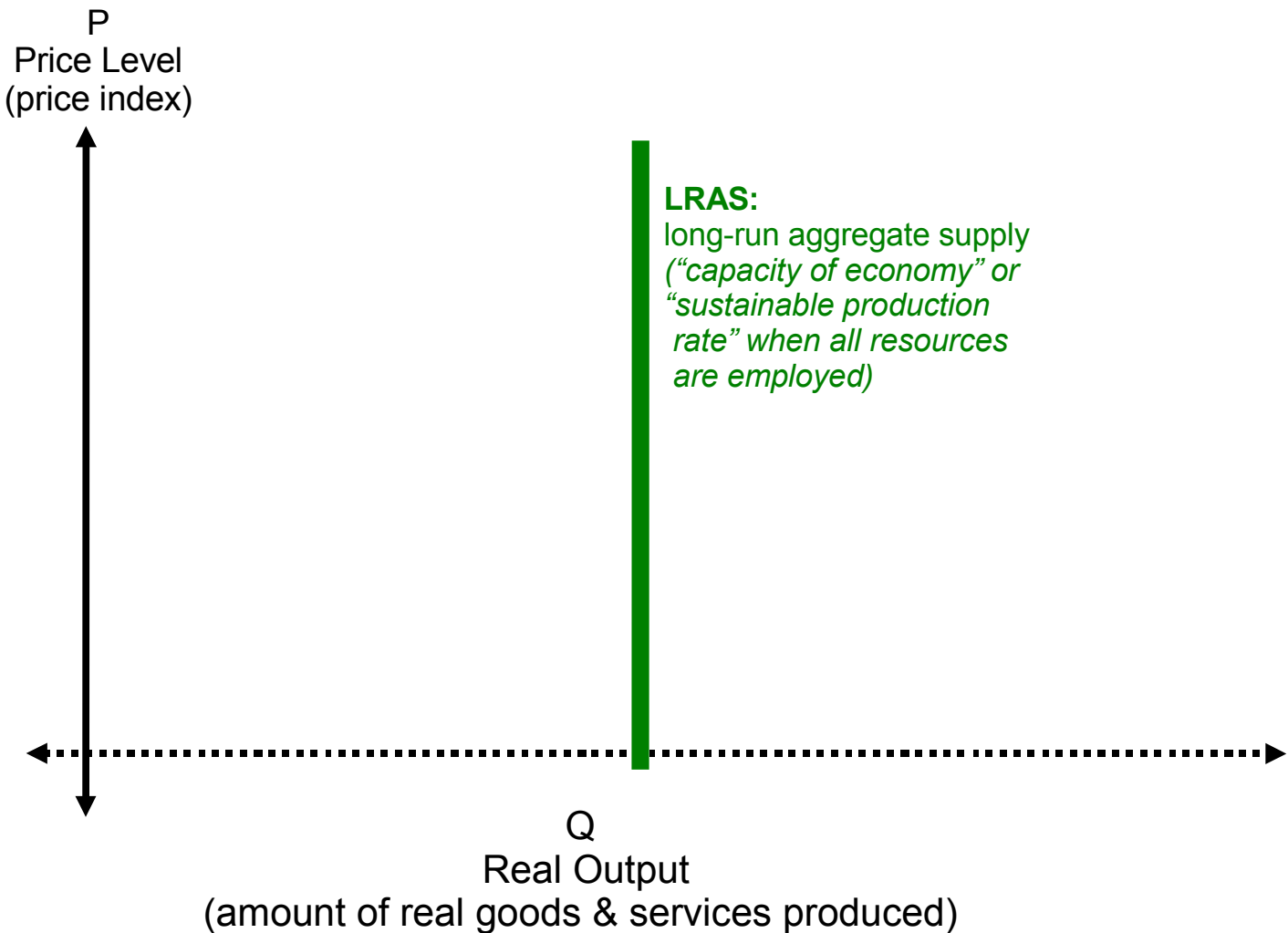
Long-Run Supply: *The Question of Capacity & Resources*

So far our model has two parts: AD, representing the demand for real goods, and SRAS representing the short-run reaction of firms/workers to price changes.

There's one missing piece: *capacity and resources*. As the Production Possibilities Curve model (see micro economics) shows, a society's ability to produce is limited by the availability of resources and technology.

Next, we show how society's long-run ability to produce, *given existing resources and technology*, can be shown in the model.

Production Possibilities are determined by available resources and technology --- not by the Price Level.

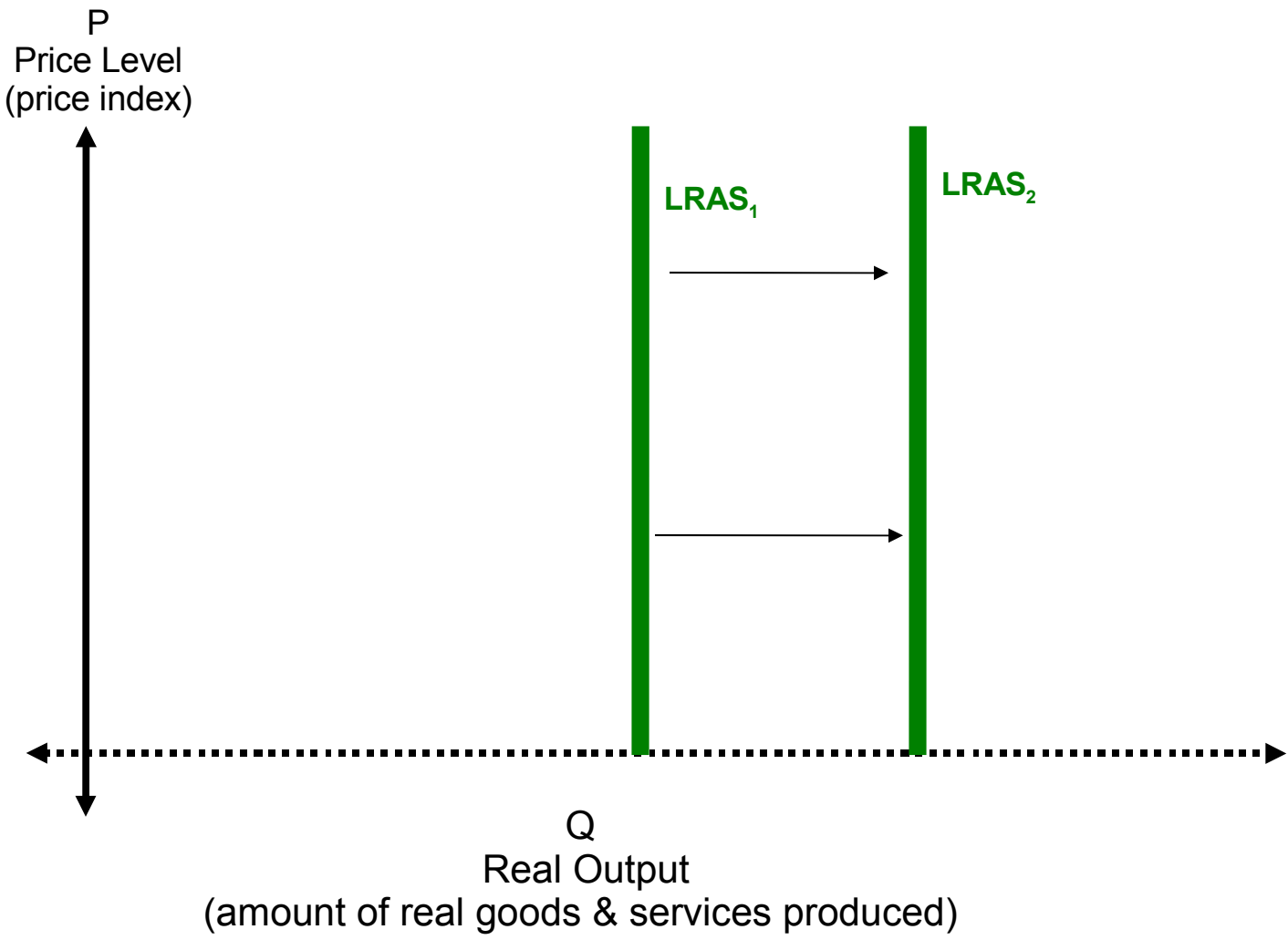


Capacity is represented by the *Long-Run Aggregate Supply curve (LRAS)*. *LRAS is vertical because it says that long-run, our ability to produce is limited by the amount of resources and technology we have, not what money price we put on those resources.*

Long run growth is a shift in LRAS.

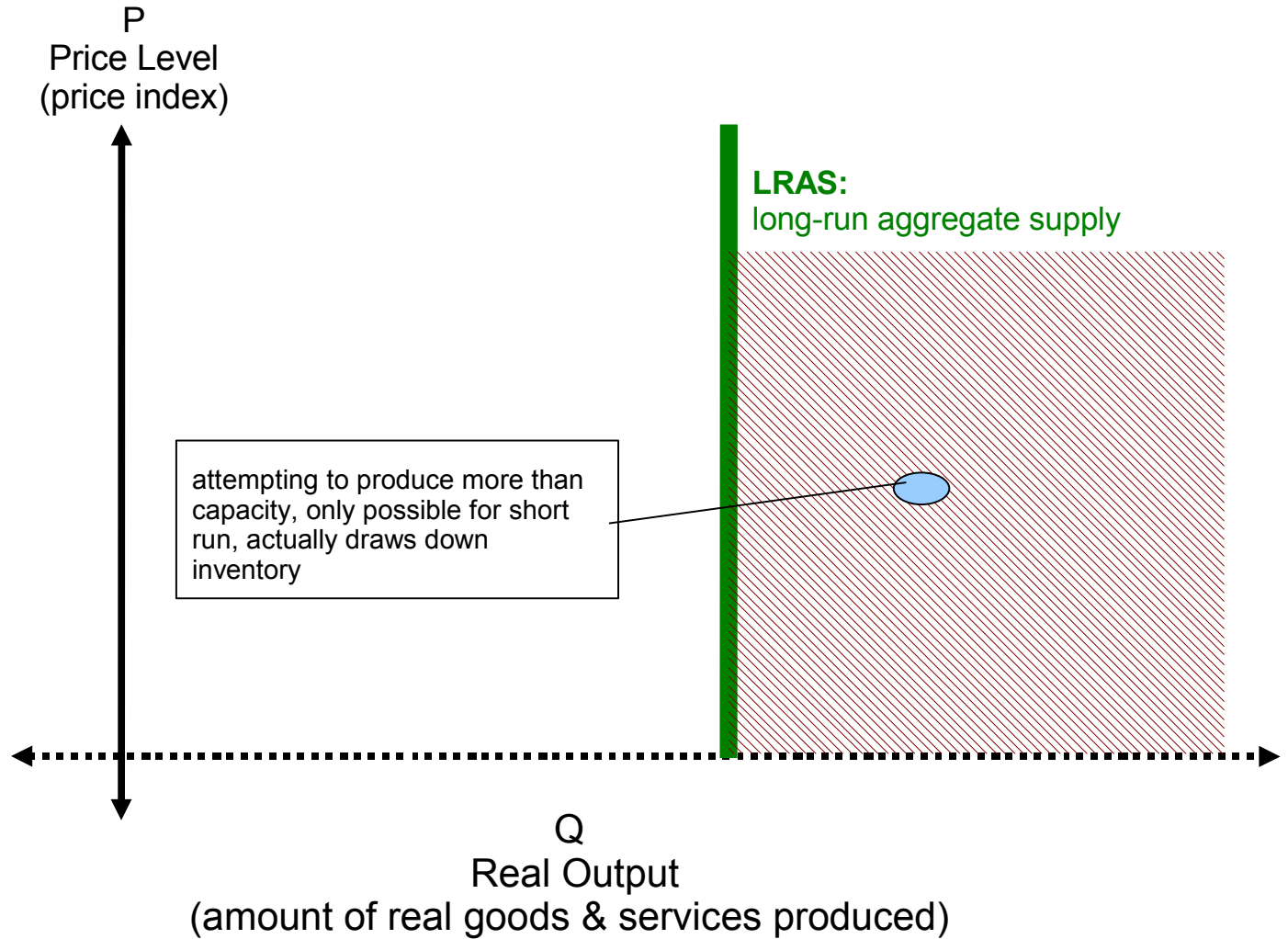
Long run growth happens when the economy gains more resources and better technology. This shows as a shift to the right in LRAS.

A shift to the left means the economy has lost resources – likely the result of war or disasters..



What if firms and workers attempt to produce more than we have the capacity to produce?

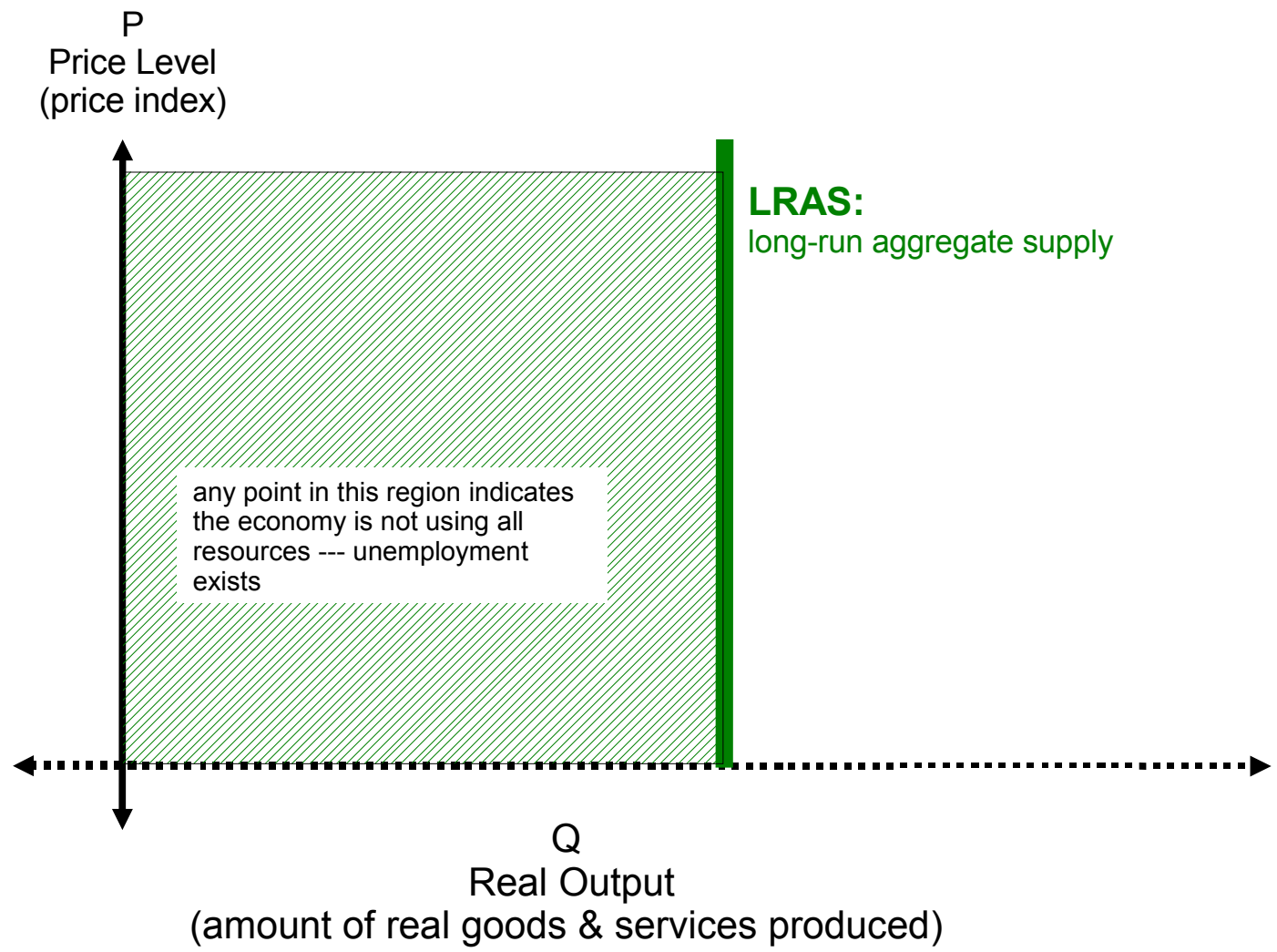
In a market economy, there is no central plan – there are only the individual plans of many firms and households. It is possible that the sum of all these plans will be an amount of real GDP that is not feasible because it requires more total resources than the society possesses. If this happens, shortages of resources will develop.



If economy is to left of LRAS → unemployment exists since not all resources are being used.

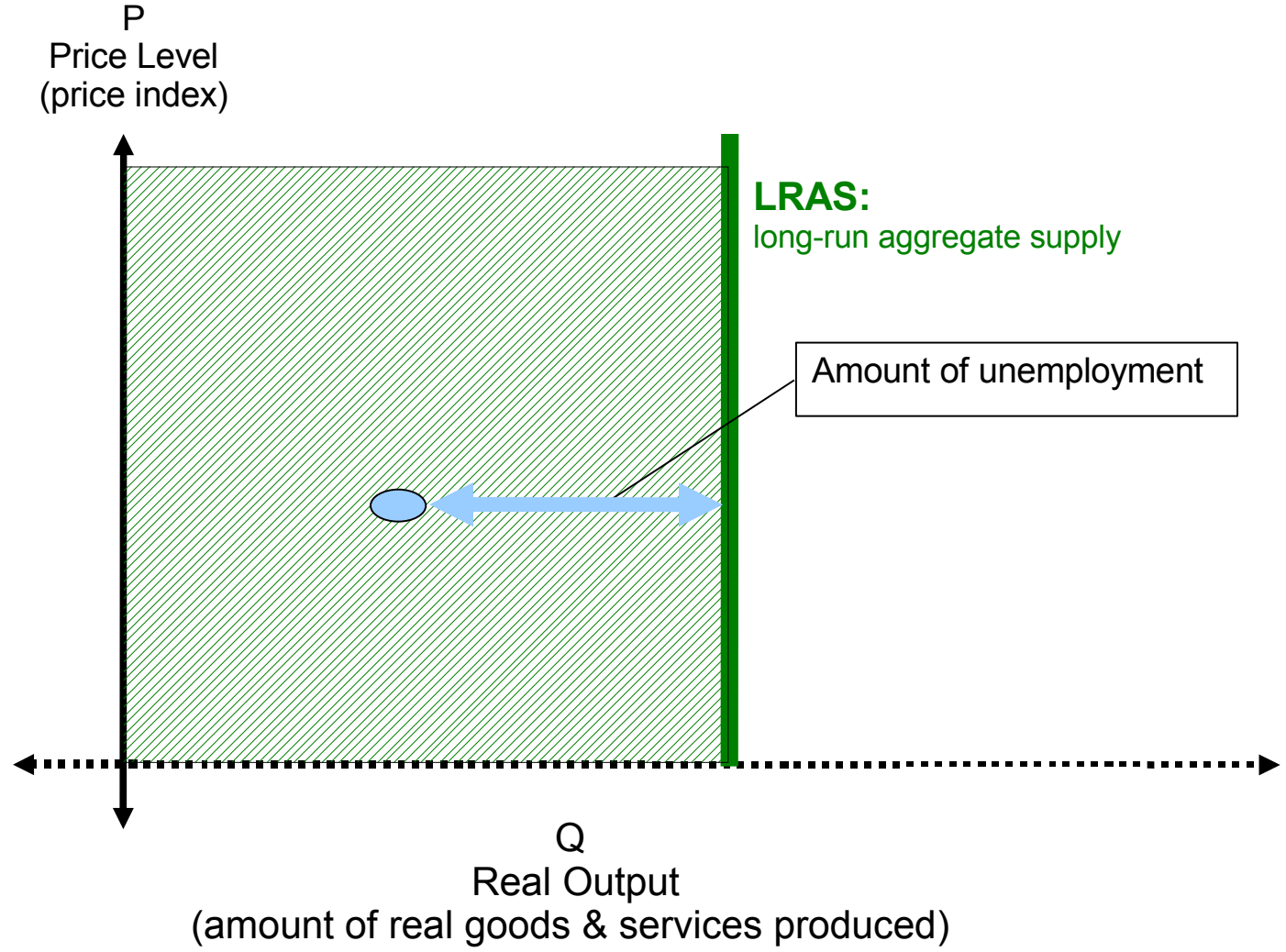
On the other hand, if the total of everybody's plans requires less than the resources available, then unused resource exists.

Typically, the unused resource is labor. In other words, too little production and unemployment results.



The Unemployment gap.

If the economy is to the left of LRAS, then the distance between where the economy is and LRAS represents an "Unemployment gap". The longer the distance, the more unemployment must exist because resources aren't being used fully.



Putting them altogether.

We're now ready to put all three curves together.

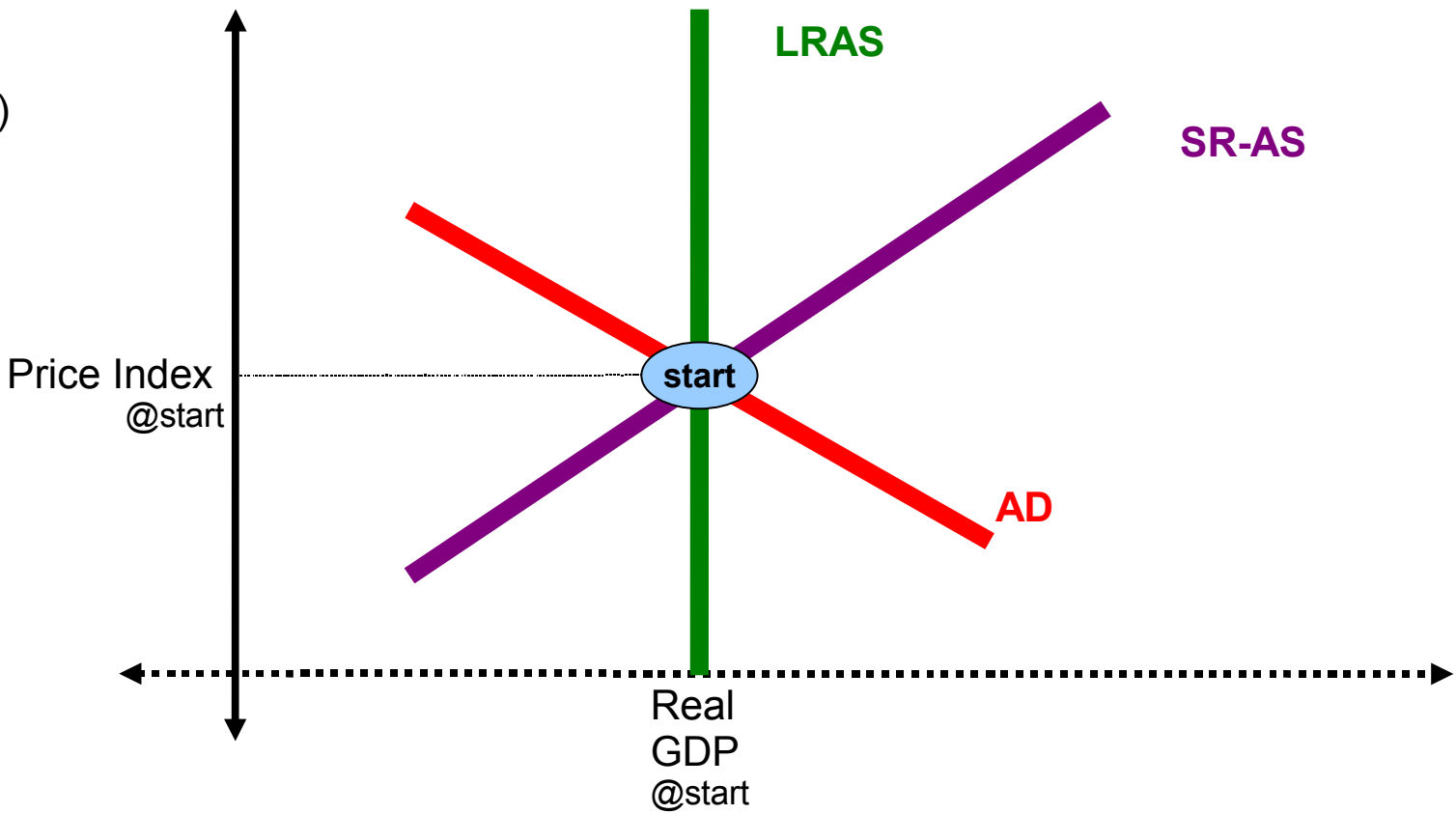
The economy is initially at some short-run equilibrium – the intersection of AD and SRAS.

What is immediately important is where this short-run equilibrium, this intersection, is relative to LRAS. Is the intersection of AD and SRAS on, to the left, or to the right of LRAS?

There are 3 possibilities.....

Long-Run Full Employment Equilibrium

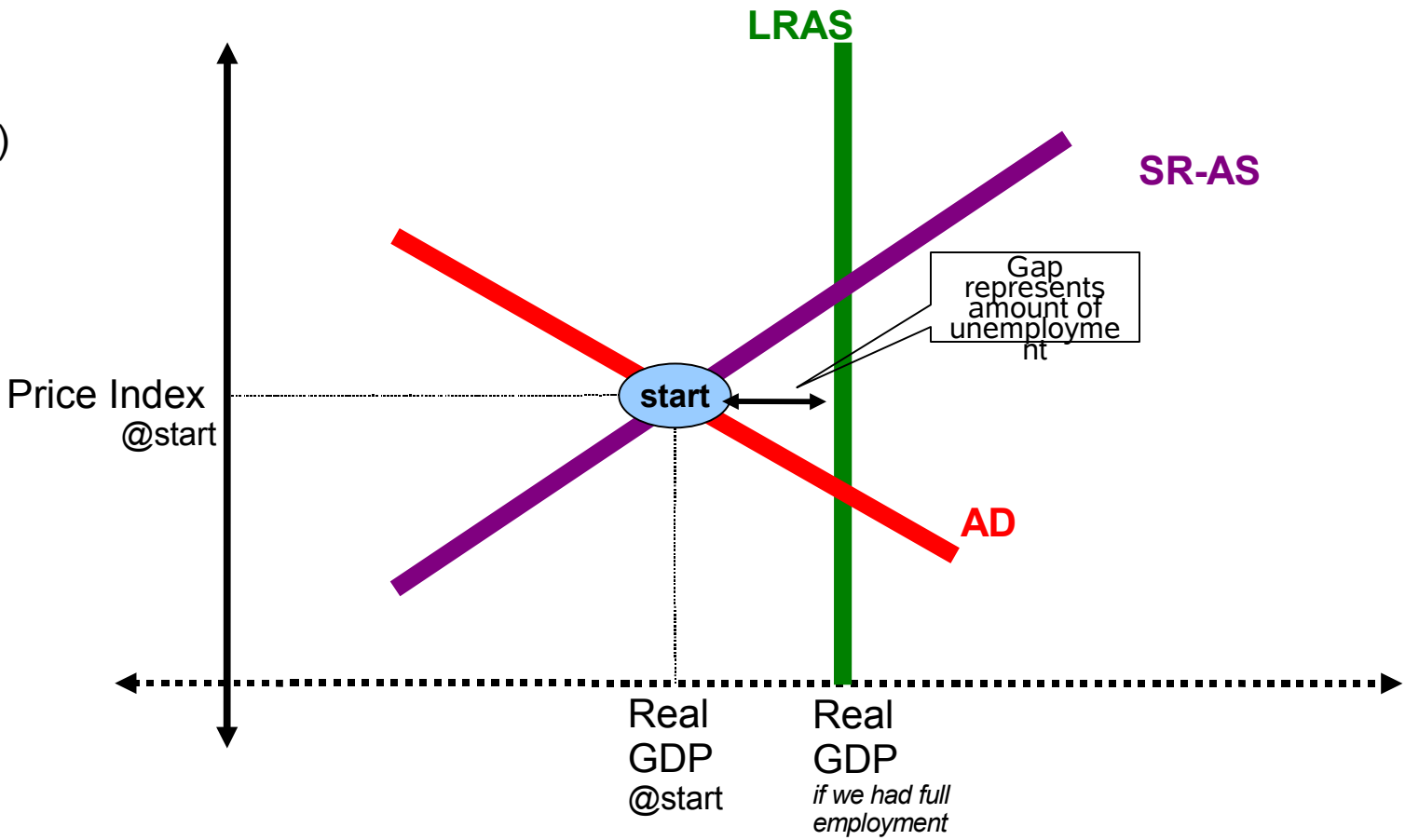
P
Price Level
(price index)



IF the economy's short-run equilibrium ***happens*** to be on LRAS (all three curves intersect together), then we are at a full-employment long-run equilibrium. Everybody is working, we produce to capacity, we sell all of our production, and we buy all of our production. *"life is good in a macro-sense"*

Recessionary Gap (also known as “contractionary gap”)

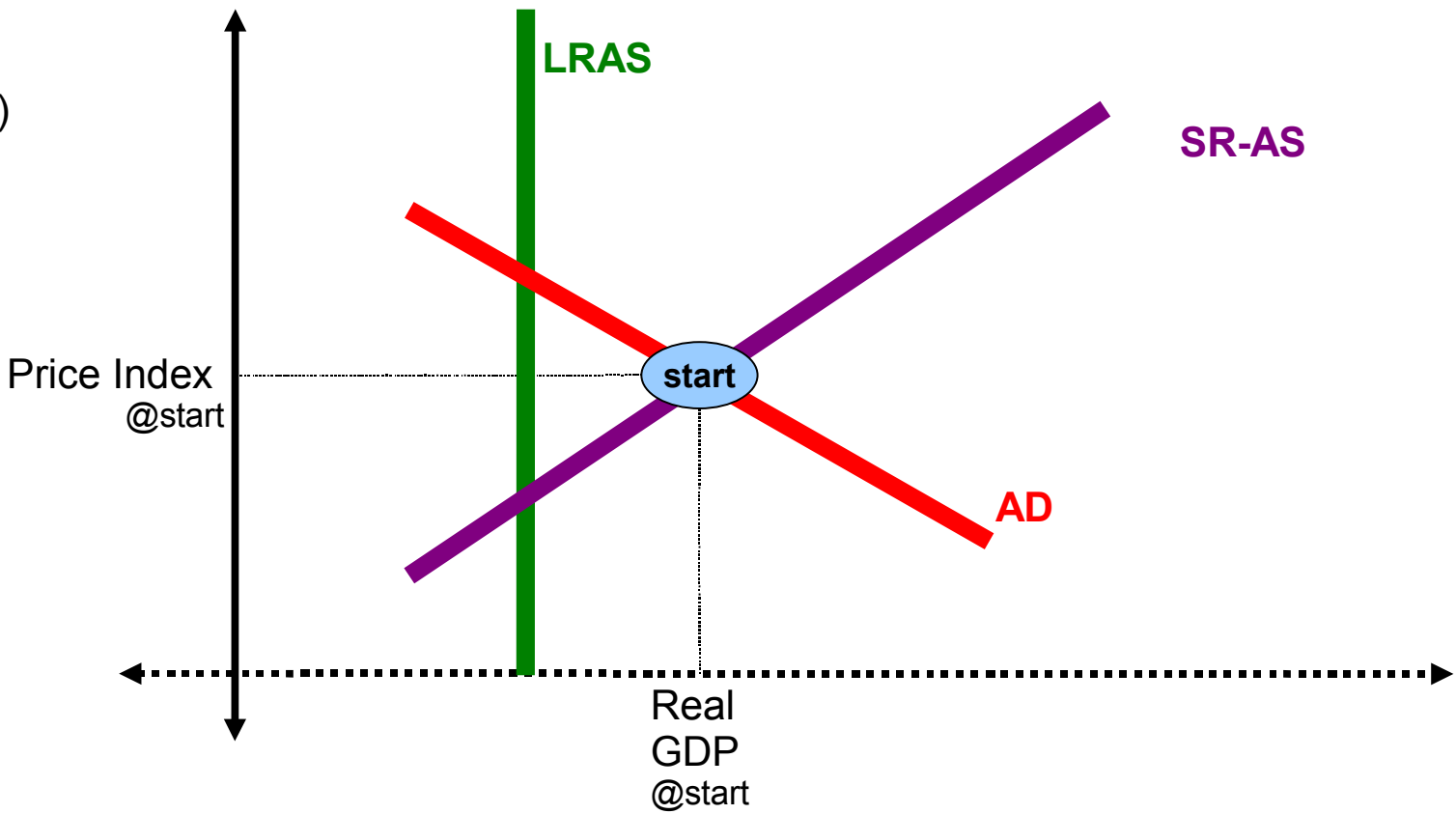
P
Price Level
(price index)



If economy happens to be this situation, then recessionary gap exists. Unemployment exists and there is gap between actual production and potential production.

Inflationary Gap (also known as Expansionary Gap)

P
Price Level
(price index)



If economy is in this situation, then Inflationary (Expansionary) Gap exists. We are actually selling and buying more goods than we are capable of producing. Of course we can only do this by drawing down (selling) inventory. This can only happen for a relatively short period of time.

That's it.

Our AD-AS model is now complete. Of course, we should call it a AD-SRAS-LRAS model, but it's customary in economics to just call it AD-AS, or Aggregate Demand-Aggregate Supply.

The model, as we have developed it so far, is just a way to “map”:

- ◆ The current levels of real GDP & price level.
- ◆ How buyers and producers will likely react to changes in price levels.
- ◆ What the capacity, or full-employment output level, of the economy is.