

THE ECONOMIC SYSTEM

"Nobody ever saw a dog make a fair and deliberate exchange of one bone for another with another dog. Nobody ever saw one animal by its gestures and natural cries signify to another, this is mine, that yours; I am willing to give this for that."

(Adam, Smith, *Wealth of Nations*, 1776: Bk 1, Ch.2: p.26)

"Man might be defined, 'An animal that makes *Exchanges*': no other, not even of those animals which in other points make the nearest approach to rationality, having, to all appearance, the least notion of bartering, or in any way exchanging one thing for another. And it is this point of view alone that Man is contemplated by Political Economy."

(Richard Whately, Archbishop of Dublin, *Introductory Lectures on Political Economy*, 1832: p. 7)

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EXCHANGE

It can be said (and has been said) that the unifying subject matter of economics is **exchange**. By exchange, we mean transactions of goods and services between people that are *reciprocal*, *voluntary* and *transparent*.

- (1) **Reciprocal** - by this we mean one thing for another. That excludes transactions which are one-sided, e.g. gifts. It is not that gifts are not important. But the motivations for someone to *give* something to another are too variegated and involve too many other factors (affection, family ties, social/cultural expectations, hierarchies, etc.) to be amenable to straightforward analysis by economics alone.
- (2) **Voluntary** - by this we exclude transactions which are *forced* by other people, e.g. by theft, enslavement, etc. For a transaction to be truly voluntary, one must always have the option to *reject* the transaction altogether and return to the *status quo ante*. If the option to withdraw is not available, then it is not voluntary.¹
- (3) **Transparent** - by this we mean to exclude fraud and misinformation. When you exchange money for an apple, you expect you are buying an apple. If it turns out to be a rubber ball, you have been fooled and that transaction cannot be really called an 'exchange' but rather a form of theft.

Why are we going through such acrobatics? Because we want to clearly and strictly delineate the subject matter of "economics". Economics is the science that studies *exchange*, specifically voluntary, reciprocal and transparent exchange.

It is not that gifts, force and fraud are not part of reality or impinge on the economy. Rather, it is that economics by itself is not equipped to address those situations. We would need additional input from other fields, like political science, philosophy, psychology, sociology, anthropology, law, criminal justice, etc.

But in examining the mechanics, institutions and consequences of *exchange*, economics has a near-monopoly of interpretation. Exchange is *the* subject matter of economics.

¹ The possibility to cancel the transaction and return to the previous state is the critical feature of the concept of 'voluntary'. If your grocer demands \$5 an apple, you can say "no" and return to your previous apple-less state. But when a mugger demands "Your money or your life!", this is a false choice, it is involuntary by definition since you can't simply say "no" and return to your previous unmugged state.

THE ECONOMIC PROBLEM

Why is exchange even interesting?

Because it is a **mechanism** humans have devised to address the problem of *misallocation of resources*.

By '**resources**' we mean simply finished goods (cakes, cookies), or the primary ingredients (sugar, flour, eggs, labor, oven) to make such goods.

Resources are **misallocated** by history and chance. Consider three people, Alphonse, Beatrice and Charlie. It may happen that Alphonse only has only 300 grams of sugar, Beatrice only has 600g of butter and Charlie only has 900g of flour. They would all be better off if each had some sugar, butter and flour, which would allow each of them to turn those resources into scrumptious cookies to eat (say, the cookie recipe requires 100g sugar, 200g butter, 300g flour). But so long as resources are divided up the way they are, Alphonse is limited to eating mouthfuls of sugar, Beatrice have to eat butter sticks and Charlie gobbles flour. The allocation is less than ideal.

Misallocation:

Alphonse
300g sugar

Beatrice
600g butter

Charlie
900g flour

We could improve our situations by **reallocating** those initial resources. There are several mechanisms, or ways, of reallocating resources. We shall be considering two: *central planning* and the *market system*.

Note: Some economists like to summarize this original problem as "**scarcity**", that is, the eternal human condition of having too many desires to fulfill and not enough resources to fulfill them.

Scarcity: the fundamental economic problem, where human wants are unlimited but resources are limited.

A situation of scarcity requires careful **allocation** of resources among different, competing desires. We want to properly allocate resources to satisfy as many desires as we can.

CENTRAL PLANNING

Central planning is the simplest and most straightforward way of reallocating resources to meet more desires. Namely, somebody (the 'central planner') takes stock of all the resources available, makes a list of all the desires and needs to be fulfilled, and devises a plan to allocate the resources accordingly.

Central planning is analogous to the manner in which we handle allocation problems in our private lives. Time, for instance, is a scarce resource. We want to do many things within a day. How do we allocate the few hours we have available among the many activities we want to do? Simple. We make a list of what we want to do, rank them by priority and dedicate the hours accordingly. If our plan is done properly, we get as much done as possible in the limited amount of time we have available.

In principle, this method could be applied to a wider economy to solve the misallocation problem. Take our three-person case with sugar, flour & butter misallocated. Imagine they all agree to place all their resources (or at least the superfluous portions) in a central warehouse. Say, Alphonse supplies the sugar, Beatrice supplies the butter, Charlie provides the flour. We then ask the warehouse owner - call him "the planner" - to redistribute them back to our people in more desirable bundles. The planner will combine and re-divide the resources in the warehouse into three small baskets, each containing some sugar, some butter and some flour, and hand those baskets over to them. Problem solved. They can all now make (and eat) cookies.

Alas, this straightforward method of reallocations becomes immensely complicated when extended to something as large as an economy as a whole. And where it has been tried in practice, it yields up immense difficulties.

In practice? Yes. Because central planning is *exactly* how socialist and communist economies - USSR, People's Republic of China, Cuba, etc. - work (or worked).

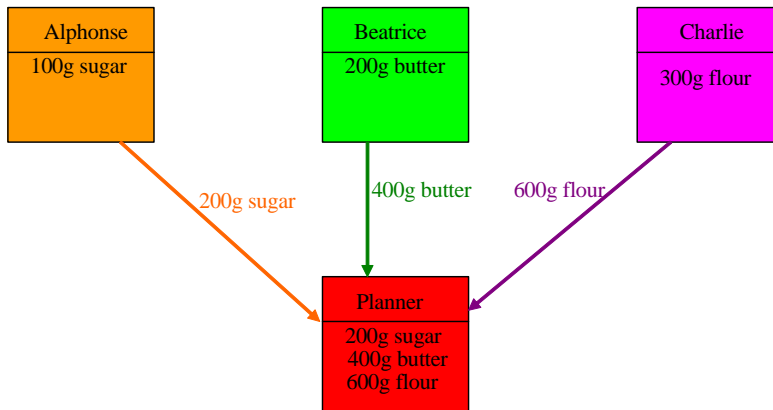
Communist allocation principles are succinctly summarized by the old Marxist slogan "*From each according to their ability, to each according to their need!*"². That is the central planning mechanism in a nutshell: collect the resources people have ('from each according to their ability'), and re-distribute them according to priorities ('to each according to their need').

In the Soviet Union, the government determined the allocation of the country's resources basically on a priority basis. A big ministry, known as the GOSPLAN, was dedicated to calculating every year how many tractors to build, how many fields to sow, how much grain, cloth, rugs, slippers, forks, etc. to produce and where and to whom it is to be distributed.

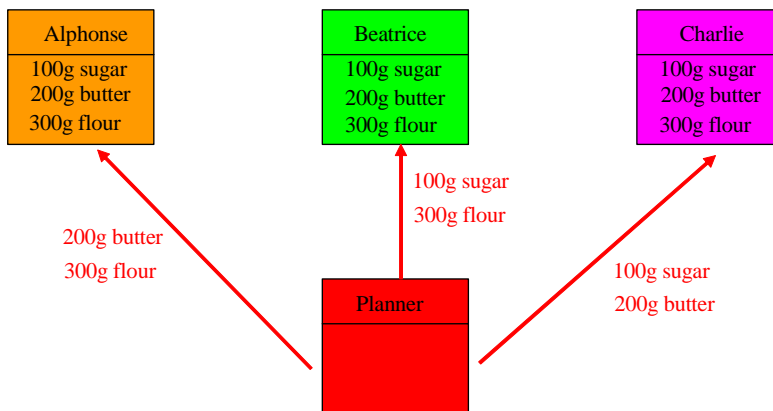
² Karl Marx, *Critique of the Gotha Plan*, 1875: Pt. I

Basically, a single ministry put all the country's resources in a pile and then allocated them out to the population.

Central Planning, Step 1 - From each according to his ability....



Central Planning, Step 2 - To each according to their need...



The problem is that this is an immensely complicated calculation problem.

For starters, there's the problem of gathering the relevant **information**. A single household *knows* the resources it has available and *knows* its own needs and desires, so it's an easy process. But for an economy, you need to know *all* the resources available in a country, you need to know (or estimate) *all* the people's wants.

Even if you manage to collect that information, then you have a monster of a **calculation** problem to ensure its all allocated properly (particularly at a time when electronic computers did not exist!). Make a mistake, and you might very well end up with disastrous misallocations, shortages and even famines.

e.g. suppose you overestimate the need for tractors; by allocating more steel & labor to tractor factories, less steel & labor is left over for railway car manufacturing; the end

result may very well be that you end up with piles of grain which you don't have enough railway cars to transport to those who need it. Grain rots in the field, while the cities starve for bread. This waste may sound extreme, a parody even. Alas, such examples are all too easy to find in the actual history of planned economies.

All this, of course, prompts the question: if the system is so inefficient in practice, so much misallocation and waste, is there a better way to allocate resources properly? One alternative is *the market system*.

THE MARKET SYSTEM

The market system is counter-intuitive. The market system doesn't use the logic of prioritization or make lists of resources and needs. In fact, it doesn't use much of any system at all. In essence, all the government has to do is turn its back on the allocation problem altogether and not get involved.

How then are resources moved around to ensure as many desires as possible are satisfied? Easy: let the people do it themselves. *Let them exchange*, freely and without hindrance.

Or, to quote the 18th C. French liberal slogan, *laissez faire* (lit: 'let do', or 'let them do', 'leave it be', 'don't interfere').

The market system seems like the epitome of disorganization. No one is in charge. No one is telling a tractor factory to produce 150 tractors and another to produce 50 railway cars. But how can disorganization be a solution to misallocation?

The trick lies in the very *nature* of exchange. If it is reciprocal, voluntary and transparent, no one will exchange the resources they have for things they don't want. The government doesn't need to guess what they want. People themselves know what they want and, more importantly, how badly they want it.

Consequently *every* act of exchange is **mutually beneficial**: both the exchangers are *necessarily* happier.

We say "necessarily", because it is an axiom of human behavior that no one in the possession of their minds, fully informed and of their own free wills, will do anything detrimental to themselves.

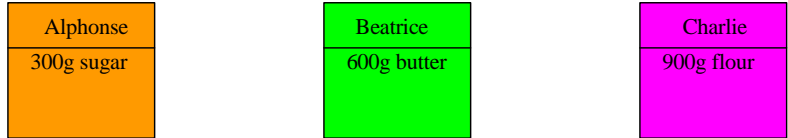
So, by accepting this axiom - that no one will willfully and knowingly engage in exchange that is detrimental to themselves - that *necessarily* means all acts of exchange go to meet some want that was unsatisfied for *both* parties involved. As both parties fulfill some want that was unfulfilled before, then *both* parties are consequently "better off" in terms of having *more* of their desires met than they were before.

In other words, by exchange, individuals, move step by step, towards greater and greater satisfaction. They give up resources they don't want so much for things they want more.

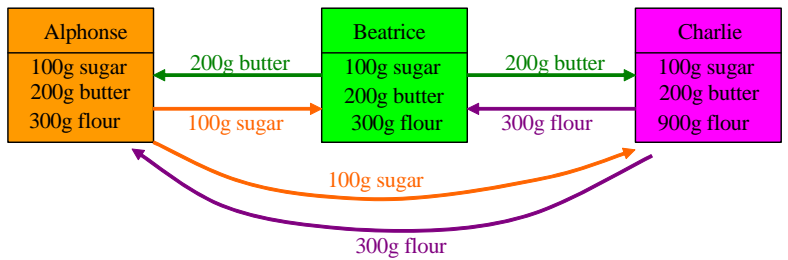
I surrender several hours of my time a day in order to earn money to buy wine. It is not that I don't value my leisure, but I have enough of it left over that I'm willing to sacrifice a bit of it to get some wine that I don't have. That means that what I give up (eight hours of leisure) is worth *less* to me than the four bottles of wine that I can buy with the wages I earn. Consequently, by exchanging labor for wine, I am *happier* as a result.

In our three-person example, Alphonse has a superfluity of sugar - 300g. Calculating that he only really needs 100g for himself, Alphonse is willing to trade the remaining 200g of sugar away to Beatrice and Charlie in return for some of their butter and flour, something he wants more. It is in his interest to do so. And it is in the interest of Beatrice and Charlie to agree, since they have a superfluity of the latter but not enough sugar to meet their needs. So sugar, butter and flour will be reallocated by bilateral exchange between the respective parties. No planner needed.

Initial allocation:



Market Exchange:



THE PRICE MECHANISM

The market system operates on the basis of what is called the "**price mechanism**". This reflects the fact that:

- Prices are a *record* of private exchanges between people.
- Prices contain *information* about the current scarcities of goods in a society.
- Prices *adjust* automatically when the underlying scarcity conditions change.

As a result, when combined with the selfish desire for gain, the price mechanism tends to act as a *signal* and *guide* private economic activity to meet the more urgent scarcities.

(1) Exchange ratio

The **exchange ratio**, or the ratio at which people trade one good for another, has a more familiar name: *price*.

Alphonse traded 100g of sugar for 200g of butter from Beatrice. They both agreed to it. The resulting exchange ratio is 1 sugar : 2 butter. Or the price of 1 sugar = 2 butter.

Alphonse traded 100g of sugar for 300g of flour from Charlie, so the resulting exchange ratio or price of 1 sugar = 3 flour.

Beatrice traded 200g of butter for 300g of flour from Charlie, the resulting exchange ratio is 2 butter = 3 flour or, if you prefer, price of 1 butter = 1.5 flour.

Notice that the exchange ratios are consistent: in this mini-economy. Expressed in terms of sugar:

$$\text{price of 1 sugar} = 2 \text{ butter} = 3 \text{ flour}$$

or if you prefer to express it in terms of butter:

$$\text{price of 1 butter} = 0.5 \text{ sugar} = 1.5 \text{ flour}$$

or if you prefer to express it in terms of flour:

$$\text{price of 1 flour} = 1/3 \text{ sugar} = 1/2 \text{ butter}$$

All equivalent ways of saying the same thing: that in this economy, sugar was traded for twice its weight in butter and three times its weight in flour. These are the **prices** of this exchange economy.

Why these ratios? We'll be examining this in more detail later. But for now let us note that it reflects how much is available, how much they want it and their individual

bargaining skills When Alphonse and Beatrice meet in the marketplace, they will haggle and higggle, hem and haw, plead and feint - all the usual bargaining tricks - to try to get the most favorable exchange ratio they can from the other, e.g. Alphonse might demand 400g of butter for 100g of sugar; Beatrice may counter-offer 100g of butter for 100g of sugar, and on and on it goes. Where exactly the final exchange ratio will land is not certain (we don't have enough information to solve this here). But it is bound to be approximately 1 sugar : 2 butter. Why? Because notice that in this economy, sugar is rarer than butter - 300g of the former, 600g of the latter. Alphonse only has 300g of sugar, he needs to retain 100g for himself, so he only has 200g of sugar to exchange for butter and flour. He has to be very careful in parceling that out, as he doesn't have that much to offer. By contrast, Beatrice has 400g of butter to sell (after deducting the 200g for her own use). Although she will also try to get as much butter and flour as she can for it, she has a little more wiggle room. A ratio of 100g sugar = 200g butter is acceptable to both parties and reflects the underlying scarcity. They are bound to approach that exchange ratio via their higgling and haggling.

[Take everything I say here with a large grain of salt. More information is needed - e.g. degree of desire, extent of competition, etc. - to hone down on the exact exchange ratio.]

In sum, critical in the market system is **price**. Price is integral to exchange. The price of something is what we are willing to give up for it in exchange.

As we have seen, price is a *result* of exchange - it was the fact that Alphonse agreed to trade with Beatrice at a ratio of 100g of sugar to 200g of butter that *makes* the price of sugar = 2 butter. But price is not only a record of past exchange, it is also a guide to future exchange.

(2) Informational role of prices

Prices can help us measure the extent of scarcity in an economy. Diamonds are expensive, water is cheap. That isn't a reflection of how much we need it – diamonds are practically useless, water is vital for life. What it does is reflect the combination of *desire* and *rarity* of those goods in society, i.e. their *scarcity*. Diamonds are expensive because there are so few of them and people desire them so much they are willing to give up a lot for them. Water is cheap because, while people need it desperately, there is so much of it around they aren't willing give up a lot for a particular bottle of water.

So prices contain all the relevant **information** needed in a market economy. By looking at prices, we can deduce that diamonds are in short supply relative to the wants of society and we know water is abundant, relative to the wants of society.

If you see the market price of a diamond is \$1,000, and the market price of a bottle of water is \$1, that can only be if diamonds are scarcer than water. You can deduce that information immediately.

There is really no guesswork involved, no questionnaires to fill out, no estimates to be cranked out by computers and overworked bureaucrats. You don't need to know how much steel or tractors or spoons are available or needed. All you need to observe their market prices, and you immediately get a picture of the social situation.

(3) Price adjustment

In free exchange, **prices adjust** automatically to reflect the changing situation. In a parched desert, where water is rare, it automatically becomes expensive. People in a desert are willing to give up fistfuls of diamonds for a cup of water, so naturally the price of water will be greater than that of diamonds.

You don't need a planner, you don't need someone in charge, to make sure things adjust appropriately. It is automatic. Exchange is driven by people's self-interest, and it is people's self-interest that guides and settles on a price via voluntary exchange.

Now, it may seem unconscionable to our moral sense that the owner of the sole water-well in a desert – call him Mustafa - should be charging one thousand dollars per cup of water. He is profiteering from people's desperation. The poor cannot afford it, only the rich. That is true. But it accurately reflects the value of the cup of water in a desert.

So prices are different in different social situations. Or put another way, since prices reveal information about underlying scarcities in a society, then *prices adjust* to reflect changing social circumstances.

(4) Price signals

Because prices contain information about the underlying scarcity of a society, it can (and usually does) act as a **signal** to indicate where scarcities are more urgent. In other words, price is a signalling mechanism that can (and usually does) set in motion private economic activity to address underlying situations of scarcity.

Consider our desert example again. The high profits Mustafa is making on his desert well might (and will) induce others to get in on the action. If another person - a citydweller we shall call Abdul - hears of the price of water Mustafa is charging in the desert, - \$1,000 a cup - then Abdul will load up a cistern truck with water and drive it into the desert and sell water too. He does it, not because he cares about desert-dwellers, but because he wants to make that kind of profit too.

So price signals induce the allocation of resources *towards* the most urgent desires and greater rarities. Again, there's no guesswork involved. All Abdul needs is to see the price and then he can immediately deduce what he should do with his cistern truck.

Should the government get involved and try to manipulate or control prices, it can ruin the entire signalling mechanism. Should the government, shocked by Mustafa's price-gouging of poor desert-dwellers, force him to charge \$1 a cup, water will remain as rare

as before – rarer even, since cheap \$1-per-cup water may encourage over-consumption of water and dry Mustafa's well completely. But more importantly since Abdul does not see the \$1,000-a-cup price, he *will not know* water is scarce there, or certainly will not bother to drive his cistern truck of water into the desert. As such, water remains rare, the desire for water remains unsatisfied, and nobody is induced to do anything to relieve the scarcity. The end result of government price controls may very well be to severely harm the very desert-dwellers it thought it was trying to help.

Private market exchange generates an automatic **price mechanism**, which is extremely revealing and can guide the allocation of resources along proper grooves to relieve scarcities and more fully satisfy unmet wants.

In sum: market exchange is a decentralized reallocation mechanism; through exchange, resources will move around so that more wants are satisfied. By this piecemeal fashion, people will undertake the reallocation of resources themselves, to satisfy their wants better.

In a market system, there is less prospect for horrific error than in a centrally-planned economy, because instead of "one big task" conducted by a single person (the government), relying on a ton of poor information and lots of guesswork, we have lots of "little manageable tasks", conducted in a decentralized manner by millions of people, each relying on a small bit of information, knowledge about their wants and means.

EFFICIENCY

It is the stated assumption of economics that **efficient** allocations are a good thing.

Defining efficiency

Colloquially, "efficient" refers to a situation without waste, or getting the most you can out of something. This is where the popular term "economize" (meaning: "avoiding waste") and "Economics" comes together. Economists are obsessed with efficiency. That is, allocating resources so that as many wants are satisfied as possible with the given amount of resources.

In a more precise language, an "efficient allocation" of resources is one we cannot unambiguously improve upon.

Efficiency: a particular allocation is said to be efficient if *any* attempt to reallocate those resources in order to make someone better off will necessarily leave someone else worse off than before.

This definition, due to the Italian economist Vilfredo Pareto, is sometimes called "**Pareto efficiency**".

It may seem like a strange definition of efficiency. But it is actually quite intuitive.

What it says is simply that something is "inefficient" if we can definitely do better by shifting things around some more (i.e. no one gets hurt). Conversely, a situation is "efficient" if we can't do unambiguously better, i.e. someone gets hurt when we try to shift things around.

To use an old example, we know the initial endowed allocation, when Alphonse had 300g sugar, Beatrice 600g butter and Charlie 900g flour was an *inefficient* allocation. How do we know that? Because we *could* re-allocate resources so that each ended up with a bundle (100g of sugar, 200g butter, 300g flour) which made them *all* better off.

- Alphonse preferred the new allocated bundle (100g sugar, 200g butter and 300g flour) to his original endowment (300g sugar)
- Beatrice preferred the new allocated bundle to her original endowment (600g butter)
- Charlie preferred the new allocated bundle to his original endowment (900g flour)

So the initial allocation must have been *inefficient*: they could improve their situations without hurting anybody.

Granted the old allocation was inefficient. But is the new allocation *efficient*? Probably. The cookie recipe, remember, was 1 sugar : 2 butter : 3 flour. So if each has bundle (100g, 200g, and 300g) it is impossible to shift around things some more in a way that

makes them *all* better off. We could, say, try to continue and force Alphonse to give 10g sugar, 20g butter and 30g flour to Beatrice. Beatrice would be certainly better off (she can make more cookies). But Alphonse would be worse off (he'll make less cookies). Even just a marginal change in the allocation, say Alphonse giving 1g of sugar to Beatrice, means he would make slightly less cookies.

So the allocation where each receives (100g sugar, 200g butter and 300g flour) can be called "efficient". We cannot unambiguously improve upon it. We can't reallocate things from there to make everyone better off. Someone will get hurt.

Note that it is not the *only* efficient allocation. Other allocations are possible which are also efficient. More on that below.

Efficiency of markets

Exchange is a reallocation of resources. Since it unambiguously improves the welfare of both parties involved in the exchange and hurts no else (since no else is involved), it is unambiguously an *improvement* over the previous situation. So the previous situation could *not* have been efficient.

To use an old example, Alphonse having 300g sugar, Beatrice 600g butter and Charlie 900g flour is an inefficient allocation since they could privately trade sugar for butter for flour, and they would *all* be better off. So the initial allocation was *inefficient*: they can improve their situations without hurting anybody.

But once they each get their desired bundle of 100g sugar, 200g butter and 300g flour, they may no longer feel the need to continue trading. They have traded their resources enough to make cookies. If Alphonse continues trading, giving more of his sugar away to Beatrice for butter, he will not have enough sugar left over for his own cookies and a superfluity of butter he does not really need. At this point, Alphonse is hurting himself. So Alphonse will only trade only *up to* the point where he feels he is personally gaining and not going to be hurt by further trade. He will surrender only 200g of his original 300g of sugar, and no more.

Because of this, we know that at some point traders will stop trading. They will not continue trading in a way that hurts themselves, so we are certain market exchange moves us away from inefficient allocations and in the direction of efficient allocation.

Indeed, if you let exchange proceed unhampered, we will necessarily end up with an efficient allocation. This notion is so important that it has been given a formal name:

First Fundamental Theorem of Welfare: a competitive, free market exchange economy, with full information, and no externalities or other complications, *will* necessarily achieve an efficient allocation of resources.

Or put another way: if you let people exchange, the resulting allocation will be necessarily efficient.

(‘Welfare’ here means just the general material well-being of people, not the specific government program which uses that name.)

This theorem is easy to prove. But it requires a truckload of math, so I won't bother with it here. But it is pretty solidly established.³ But notice the careful wording of the conditions ("competitive", "free market", "no externalities", "complete information"). This indicates that there are situations where the theorem might not hold, where market exchange will *not* necessarily lead to an efficient outcome: e.g. if there are monopolies, or government interference (e.g. taxes, tariffs), or externalities (e.g. pollution), or incomplete information, etc.

³ The theorem was first stated by Vilfredo Pareto in his *Manuale di Economia Politica* (1906). Economists Abba Lerner, Harold Hotelling, Oskar Lange, Maurice Allais, Paul Samuelson all provided different mathematical proofs of the efficiency theorems in the 1930s.

EFFICIENCY VERSUS EQUITY

Efficient does *not* mean ethical.

An allocation can be both perfectly efficient and perfectly disgusting. For instance, an allocation which gives all the resources of a country to a single person, and leaves the rest to starve *is* efficient. That is because of the technical definition of Pareto: taking away as much as a single loaf of bread from the hyper-rich person will make him worse off than before.

The market exchange mechanism has consequently one important Achilles heel: while it can guarantee efficiency, while I can assure you no will actually be hurt *by* it, the market cannot guarantee it will achieve equitable and just distribution of resources. It cannot even guarantee it will be able to help everyone meet their basic needs for survival.

That comes from the nature of the market exchange mechanism. We *start off* from the initial allocation - Alphonse with sugar, Beatrice with butter and Charlie with flour, and proceed from there. If they exchange, they will *all* be better off than where they started.

But if the *initial* allocation is highly unjust, e.g. if Alphonse has *all* the sugar, butter and flour in the world, and Beatrice and Charlie have nothing, then Alphonse has no incentive to trade with them. In this extreme case, market exchange will not help Beatrice or Charlie meet even their basic needs for survival.

A central planner is not beholden to the initial allocation of resources - after all, he has it all centralized in his warehouse. So he can distribute from his warehouse to people *according to their need*, not according to what they offer in return.

So this is one advantage communism has over capitalism: it can secure equity, or at least some minimum degree of survivability for everyone. Capitalism cannot guarantee that this will be the result. All capitalism can say is, *given* the initial allocation, exchange will take us to a *better* place (or at least, not a worse place). But if the initial allocation is all lopsided and unjust, the better place achieved by exchange may simply not be good enough.

That is not to say that the market system is at *fault* for creating injustice. The injustice was caused by the initial allocation being so lopsided. And the initial allocation comes from history - inheritance, luck, and maybe past exchange. That's not the market's fault *per se*. It is history's fault. The market can and will improve it (or at least not worsen it), but it cannot be expected to *correct* it.

Communism can correct it. But communism, as we alluded, can be terribly inefficient in practice - mistakes are made, wrong things are produced, allocation erroneous.

It seems like we are stuck in an **efficiency-equity trade-off**: if we embrace the market system, we get efficiency but we cannot guarantee equity; if we embrace central planning, we gain equity but lose efficiency. It seems we are doomed to be trapped in this choice.

Or are we trapped? Let us consider some other ideas:

Redistribution

We know that free exchange is efficient and makes people better off. The problem is that if we start off from a highly unequal initial distribution of resources, we're not likely to achieve a very equitable result by exchange. Why not simply redistribute the *initial* allocation to a more equitable position, and *then* let market exchange proceed from there?

This proposal leans on what is commonly called the Second Welfare Theorem:

Second Fundamental Theorem of Welfare: *any* efficient allocation, no matter how equitable or inequitable, *can* be achieved by exchange, provided you appropriately redistribute the initial resources first.

This is important. What it tells you is that if you want both an efficient *and* equitable distribution of resources, don't mess around or hamper the exchange *system*; instead, mess around with the initial allocation.

If our economy starts with Alphonse having all the sugar, butter and flour and Beatrice and Charlie have nothing, let us redistribute so that Beatrice and Charlie have some commodities (say, take the butter & flour from Alphonse and give them to Beatrice and Charlie respectively). Then open the market and let them exchange.

Unlike communism, this idea doesn't propose to allocate resources according to need. It is not distributing little final baskets of sugar-butter-flour, trying to guess the right proportions. It just proposes to mix up the initial allocation a bit so it *starts* off a bit less unjust. Then leave the market be after that, and the exchangers will figure out how to go from there.

This idea seeks to have the best of both worlds. And you can see some things (e.g. inheritance tax) as something akin to "redistributing" initial resources. But a fully-fledged redistribution of initial resources is an idea more popular with quirky economists than politicians or voters.

Mixed Economies

Most modern economies operate what is called a **mixed economy**, where there economy is basically the market system through-and-through, but the state intervenes only with a little bit of redistribution at the *end* to fund a **safety net**, i.e. that if your outcome you

achieve from exchange isn't enough the supply your basic needs, the State can help you a bit with income supplements, food stamps, housing allowances, etc.

Notice that unlike the Second Welfare theorem, modern mixed economies focus of "fixing" the outcome (a little bit) rather than focusing on the redistribution of initial resources. They have the government intervene at the end, rather than at the beginning.

But some initial re-distribution does exist, although not always directly or obviously. Things like state-provided public education is effectively a redistribution of initial resources, so that those born in homes without great endowments, can nonetheless acquire education and skills, paid for by taxes on others.

Market Socialism

As we have seen, we can improve the equity of a market exchange economy with a little redistribution (whether before or after exchange). In this case we retain efficiency, and adjust to get equity.

But let's ask the question starting the other way: can we improve the efficiency of central planning with a little something too?

One of the most intriguing was first proposed in 1935 by the Polish economist Oskar Lange, known as **market socialism**. Lange proposed a mix of socialist centralization and market exchange, in a way that combined the best of both worlds.

Lange's fundamental idea was to replicate a market exchange system in a central planning environment. Instead of Gosplan planning everything to the last detail, it would simply yell out prices. Factory plant managers would be instructed to find the cost-minimizing or profit-maximizing production decisions in reaction to those prices and deliver their reports. Gosplan would subsequently review the reports, add them up, and see if the resulting supplies would meet demands. If it doesn't, then Gosplan would cancel the prices, and yell out a new set of prices - raising the prices of those goods in shortage (excess demand), and lowering the prices of the goods in surplus (excess supply) and ask the managers to make their calculations again. It would continue making adjustments to the prices this way until the amounts of goods supplied would be equal to demands.

In short, the Gosplan just "acts like" the market. And achieves a result that is "like the market", and thus avoids the inefficiencies inherent in central planning.

What's the point then? Why not simply introduce market exchange system then? Why retain the socialism bit?

Well, first of all, a socialist system is not beholden to the initial distribution of resources. Gosplan can mix these up. Leaning on the Second Welfare Theorem, it can play around with initial allocations to achieve whatever equity goal it wants.

Secondly, the free market system is not glitch-free. It is possible for there to be "**market failures**", i.e. situations that market exchange might yield up inefficient outcomes. Things like monopolies, externalities like pollution, missing markets, sticky prices, unadjustable long-term contracts, human psychological problems like uncertainty, fear, over-enthusiasm, can distort things and result in market exchange ending up allocating inefficiently. In a "market failure", too much or too little of a thing may be produced, and the price system for some reason may not be able to fix that by itself. We'll review the causes and cases of "market failures" in more detail later. Right now, you only need to consider it is possible. If you want a simple example, look around you - there is unemployment, people looking for work that cannot find work. That is inefficiency - a resource, human labor, is going unused and wasted.

Lange believed his "market socialism" could be *more* efficient than market exchange. It is certainly not less efficient, since it follows the same allocational "rules". But it can be *more* efficient since socialist systems are not trapped by market failures. That is, Gosplan can take monopolies, externalities, stickiness, etc. into account directly and make the necessary adjustments. It can overcome things like unemployment with a stroke of a pen.

Lange wrote during the 1930s, at the height of Great Depression, with mass unemployment of labor, failing farms and idle factories. Resources were going wasted. It certainly seemed the market exchange system had yielded up a gigantic failure. Many during that time called for detailed Soviet-style central planning. Lange proposed "market socialism" as a solution that would achieve both equity and efficiency, better than the market itself could.

There was a long debate between Lange and the "Austrian school" in the 1930s over this issue, known as the "**socialist calculation**" debate. The main champions of the Austrian school were Ludwig von Mises and Friedrich Hayek. The question was whether socialist calculation - whether Soviet-style central planning or Lange's market socialism - could improve or at least not be worse than the market system. While some consented Lange might be abstractly right, that it is possible for a market socialist system to achieve efficiency in theory, they gravely doubted it would manage to achieve it in practice.

Market socialism sought to have the best of both worlds. Some countries (e.g. 1970s Hungary) tried to institute something like this, and the results were mixed. A fully-fledged 'market socialist' system is an idea more popular with quirky economists than politicians.

Market Reforms

There have been other attempts at introducing market-style reforms in centrally-planned systems without swallowing the whole "market socialism" program. This usually involves partitioning the economy, so that some parts of the economy are market-allocated, while other parts are centrally-planned.

The most famous example was in the People's Republic of China in the 1980s, where peasants were allowed to retain surpluses above the production quota demanded by the central planning agency, then trade those surpluses freely on the market, retaining the profits for themselves. This was, by all accounts, a resounding success, hugely lifted productivity and living standards for the peasantry. It set China in motion towards more market reforms, so that by the end of 1990s, very little of the economy was left to central planning.

On the other hand, a similar attempt in the 1980s in the Soviet Union to allow limited market exchange was apparently an unmitigated disaster - or at least did nothing to forestall the general collapse in the economy.

The Verdict

The general consensus is that central planning, while high-minded, has not been a success. This is an empirical rather than a theoretical observation. It is not for lack of trying. Central planning was tried, in many countries, for many decades. And the inefficiencies of the planning system were just too great to continue. Market exchange systems may have their inequality, market failures, their fluctuations and their unemployment, but overall, they performed better in that same time period.

It is not that central planning did not have some achievements - and these are still debated. The most notable was the industrialization of Russia - the transformation of a large, impoverished, overpopulated agricultural country, a Third World-mess of a place at the beginning of the century, in a few short years, into an industrialized superpower, with standards of living comparable middle-income Western countries by the 1950s. Yes, it came with great violence and at a horrific human cost. But Russia managed to break out of centuries of crushing poverty. That made the Soviet example quite attractive to other big, overpopulated, impoverished Third World countries - China and India for example - who decided to also implement central planning in the post-war period.

Nonetheless, nearly all examples of central planning failed. Or rather, they succeeded only up to a point - the point of breaking out of centuries-old stagnation by mass investment in heavy industry and infrastructure. But beyond that, it failed to deliver the goods.

As a result, some have suggested the merits of central planning are limited by stage of economic development. In other words, that there are times when "misallocation", and "getting the prices wrong" may actually be desirable. Investing in machinery when labor is plentiful and cheap does not make sense from a market perspective - price signals indicate it is more sensible to use labor-intensive methods rather than machinery-intensive ones. For instance, building a railway in a coal-mine may seem like a "wrong choice", if it is cheaper to have miners just carry the coal on their backs. But the long-run future of a country that relies on brute human force for transportation is dim. If a country hopes to industrialize, "wrong choices" might need to be undertaken - choices a market would not make, but a central government planner can.

So there is might be some usefulness of central planning for limited purposes - to kick-start economic development, say, even if it should not be relied upon for allocation generally.

Since the 1990s, almost all former centrally-planned economies have switched to market systems. Some undertook that change gradually (e.g. China, Vietnam), assigning larger shares of the economy to market allocation over time. But some have done it quite suddenly - like the "**shock therapy**" in the former communist countries of Eastern Europe, where market exchange and the price system was introduced across the economy overnight. By and large, standards of living in these countries have improved greatly - even as inequality, unemployment and other problems of market economies have also popped up, there is little temptation to go back to central planning days.

Even in countries that never embraced central planning as a system, there are many areas of economic life that remain centrally planned rather than market-allocated, e.g. education, highways, etc. Their merits have been fiercely debated - while many agree these sectors would likely be underinvested or market failures otherwise, many argue that there are better ways of addressing and correcting this without embracing wholesale government planning. After all, in many overtly market-oriented Western countries entire sectors, like railways, communications, utilities, mining, oil, were once **nationalized** and run by the government during the post-war era. For a long time, this was thought to be necessary, before their inefficiencies became apparent and intolerable. Most have since **privatized** those sectors again and found other ways to address market failure concerns.

While market exchange and central planning are often held up as rival systems, that is not to say that it must be one or the other. There are various shades, combinations and solutions in between.

In summary:

- Scarcity is a human condition – too many wants, not enough resources to meet them.
- Resources are poorly distributed to begin with.
- Societies have developed systems to reallocate resources to meet as many wants as possible
- Central planning is one system or method of organizing the reallocation of resources. It is based on government-coordinated prioritization.
- The market system is another method. It depends on free exchange.
- The main drawback of central planning is usually inefficiency – i.e. wasting resources.
- Market system achieves efficiency by the price system and private incentive.
- The main drawback of market system is that it does little or nothing to correct inequitable distribution of resources.
- Most economies are **mixed** – primarily relying on the efficiency of the market system to allocate resources, with some government redistribution mechanisms to prevent excessive inequality.
- While central planning as a system has generally failed to deliver the goods, there are areas and times when some degree of planning might be useful.

APPENDIX: THE SOVIET ECONOMY

The economy of the Soviet Union was an example of the "command economy", that is an economy where resources are centralized and allocated by "command" of the government. It works very much on the prioritization logic of "household" management except that the household, in this case, is the entire economy, and the parent is the government.

If you think allocating resources in your home is a tremendously complicated calculation problem, and prone to error, imagine only the monstrosity of a problem the Gosplan ministry in the Soviet Union faced - at a time, remember, when there were no electronic computers and every calculation had to be painstakingly done with pen and paper!

First, Gosplan needs to count all the resources available in the Soviet Union - that is make a list of all the workers, factories, oilfields, grainfields, etc. in the country. That's a huge task and plagued by missing or misleading information (and deliberate lying - see below). But it is the easiest part of the task.

Then Gosplan has to get an account of all the wants of the population, that is a list of what every single person in the country desires. This was, in practical terms, impossible. So the Gosplan ministry would have to make a rough guess - people want this many mattresses, this many loaves of bread, this many spoons, this many slippers, etc.

But even so that's not the hardest part. The hardest part is making sure the plan works without glitches. Because if you make a mistake in your calculations, disaster looms.

Suppose for instance, in an effort to improve agricultural productivity and boost grain production, Gosplan decides to produce, say, 10,000 tractors. Building them isn't the problem. Gosplan just orders the managers of the tractor factories to produce that many, give them the necessary steel, allocate the necessary labor, and then transport the finished tractors to all the farms.

The problem is coordinating all that. Do you know how much steel you have available? Do you have enough left over for the other demands upon it (ship-building, car manufacturing, etc.)? Are you allocating it between those industries properly? Is the labor that you're sending to the tractor factories enough or too much? And how many tractors per farm? Did you provide enough to produce tractors but forgot to provide sufficient fuel to run them? (How much fuel? What other industries need the fuel? etc.)

As you can see, the informational needs and computational elements add up quickly to a gigantic calculation problem.

To get an idea of how the Gosplan actually tackled the problem: they tried to split the problem into a coordinated multitude of plans at three levels: (1) the "long-run" Five Year Plan (with only very loose aggregated categories) would be their basic guide; they

would then devise, on the basis of that, (2) a yearly plan, broken down further into quarters and months, for which they needed to calculate (for every month) the production of 48,000 categories of goods, each of which had to be then had to be broken down further into (3) a sub-plan (as each category had 250 sub-categories of goods), which then had to be allocated by thousands of regions and towns.

In this calculation problem, Gosplan bureaucrats were forced to cut a lot of corners and make lots of guesses and estimates. One Soviet engineer employed by Gosplan estimated that if they actually tried to do the proper calculations in full, without cutting corners, with every entry double-checked and verified as accurate, it would take 30,000 years of non-stop work by the full manpower of Gosplan to get the calculation of merely a one-year plan done. There was no choice but to cut corners and guesstimate, even at the risk of very costly mistakes.

[Another example: in the 1960s, a Nobel prize-winning Soviet mathematician, Leonid Kantorovich, devised a brilliant short-cut technique to figure out the most efficient resource allocation and, to test this new technique, attempted to calculate an efficient fully-disaggregated plan for just one industry - Soyuzglavmetal (steel production) - for one year. It took him *six* years just to collect the data, and yielded up a mathematical calculation problem with one million variables and 30,000 simultaneous equations!⁴]

Faced with a gigantic calculation problem with iffy data and a lot of guesswork, you are apt to make mistakes – mistakes with tremendous consequences. You may end up with far more tractors than you need, or have fuel to run, or too few, etc. Lots of waste can happen.

For example: suppose Gosplan overcalculates the number of tractors they should produce. But building more tractors takes resources (steel, workers, etc.) away from making railway cars, ships, etc. If they don't calculate properly, the end result may very well be that the country ends up with a lot of tractors, but not enough railway cars and ships to carry the grain from the fields to the cities. You may have improved agricultural productivity alright, but it didn't do any good. The cities starve for bread, while grain rots away in the barn. A complete waste of resources, despite the good intentions.

Another problem with command planning is that it quickly becomes politicized. So even if the planners figured it was most efficient to produce 10,000 tractors this year and leave the rest of the steel to build ships and railway cars, all that means nothing if the government leader is on an agro-kick and orders Gosplan to ratchet up the production of tractors to 15,000, even if that contradicts the ultimate objective. Again, grain rots, cities go hungry, etc.

The input information also gets distorted and politicized. Anxious to get his steel quota, manager of Tractor Factory No. 3 may exaggerate his need for steel in his report. So does the manager of Shipyard No.5. Since the allocation is based on this erroneous reported

⁴ For more of the down-and-dirty details of the techniques of Gosplan planning, see Abram Bergson (1964) *Economics of Soviet Planning*; or Alex Nove (1972) *The Soviet Economic System*.

information, not even the best computational models will get it right. Again, misallocations.

This is further marred by the fact that next year's estimates (and thus production targets) are based on this year's performance. So there is an automatic incentive for factory managers to 'aim low' in their production plans but over-demand their inputs from Gosplan "just in case". In other words, stockpile your allocated steel and underproduce your tractors. No point trying to get ahead of yourself if that just encourages Gosplan to raise production targets next year that you risk not fulfilling.

Then tack on the fact that the manager of Tractor Factory No. 3 has better connections in the ruling political party than the manager of the Shipyard No. 5. The planning model stops to matter at all. We all know who will be getting the steel.

As one observer (Alec Nove) noted: "Many if not most commands in a command economy are written by those who receive them."

Finally, remember the point of all this: meeting consumer needs and wants. But, unsurprisingly, the average Soviet consumer was the *least* politically-connected and thus the one who's voice was *least* likely to be heard in the whole planning rigamarole. As party politicians, planning bureaucrats and factory managers competed for influence over the central economic planning process, the interests of the consumer were left behind.

This yielded up the sad reality of consumer life in most planning regimes: splendid tractors and railway cars were built by the thousands, but no one remembered to produce enough spoons and milk.

That was the perennial problem of daily life in the Soviet Union from the very first day to the very last: everybody was employed, yes; everybody received a decent wage, yes; everybody had access to generous healthcare, retirement pensions, yes. But all that meant nothing if there was no spoons or milk to buy. The "wage-goods problem", the yawning gap between the generous wages one received and the few consumer goods one could buy, was the gnawing constant of Soviet life.

[A contrast many older Russians draw to the post-Soviet world: "we used to have the money, but not the goods; now we have the goods, but not the money."]

Wage-goods gaps of course are not unique to socialist systems. Market systems have it too. But a market economy would "solve" the gap problem by the price mechanism: if goods were missing and people wanted them, prices would automatically go up; and those rising prices would serve as a signal to profit-seeking producers to dedicate more resources to the production of the missing goods and alleviate the shortfall. But the Soviet Union did not operate a market system. Prices were not allowed to fluctuate. And even if they could, it wouldn't mean much since firm production decisions were guided centrally by Gosplan, not profits (although, in later years, during reforms, factory managers were given some flexibility and allowed to 'calculate profits' informally and

adjust production decisions accordingly. But as they were not allowed to keep those profits, the incentive wasn't quite strong.)

Instead, shortfalls in the production of consumer goods yielded up one of the most heartbreaking & familiar scenes of Soviet daily life: gigantic lines of people patiently forming outside of stores for hours on end, everyone hoping they might be high enough in the line to be given the chance to buy some of the scarce good. Many people had to take entire days off work to stand in line to buy simple necessities. The lucky ones were those with retired parents, in-laws or grandparents, who could stand in line for them.

Of course, just because the system didn't allow market prices, doesn't mean market prices didn't exist...illegally. Which brings up the second great phenomenon of Soviet life: the formation of **black markets**. Factory managers, store managers, etc. could (and frequently did) hold back delivery of at least a portion of the consumer goods they produced or passed through their hands, and sold it secretly on the side to family, friends and select customers at freely-fluctuating market prices. Initially, this was a small affair, illicitly conducted by low-level clerks, managers & truckers. But as time went on, it became more brazen, and higher officials in the planning system, even the top brass of the Communist Party, were fully and unabashedly engaged in it.

Of course, the more goods were siphoned off to be sold in the black market, the less were available in official stores. There, the shortages got starker, and the lines bigger. The fairness of allocation, the very stated purpose of the command economy, was lost. The country became divided into the 'haves' and 'have-nots' – that 'haves' being those with well-placed family members or connections with important officials in the hierarchy with access to black market goods. The remainder – the vast majority -- had to reconcile themselves with standing in long lines and hoping.

The need to break the centralized control over allocation decisions, to finally give average consumers a voice in the planning process, was the high-minded principle behind the '*Perestroika*' reforms launched by Mikhail Gorbachev in the 1980s. But it was too little too late, and failed to stave off a disastrous collapse in the economy and standards of living.