

FreeMoneyBasics: Description of a simple gold standard and a fractional banking economy

On the website freemoneybasics.com, we have explained the functioning of a goldstandard economy and our current fractional banking world, using formulas. Various assumptions underlie these formulas. In this article we will reason similarly, but in words and numbers. This version is based on a very straightforward and similar economy where consumers have the choice to either save or to consume.

In the first chapter we will deal with a gold standard economy. In the second we will use the same example and apply this to a fractional banking economy.

1. Gold standard economy

In our example, the consumers currently choose to consume 40 and to save 10. $M_c = 40$, $M_s = 10$. Total money available is 50. We have 1 bakery who produces bread and 1 part time banker. All consumers have deposited 10 at the bank.

All consumers also work. We assume they all work at the bakery. This shop/factory is owned by 1 person, the baker. This bakery (it doesn't matter for now if this is a person or a company) pays the workers 40. This includes paying the banker, because for now it's not a full time position at the bank. The consumers use this 40 to buy 40 bread. This is a nice and concise economy with a decent division of labour.

Why are the consumers saving? Suppose bread is the only product to buy. Also, we can assume safely consumers would prefer to buy more. However, the bakery can only produce 40. If the consumers use all their money to consume bread, the price of bread would go up, by possibly 25% (based on 5:4). However, apparently they don't prefer to buy more. They prefer to save now in order to be able to consume more in the future. They hence assume it is possible to consume more in the future if the bakery can increase the productivity.

The bakery believes he or she can produce more bread and believes to be able to increase productivity by 20%. He or she goes to the bank and receives a loan of 10, based on a convincing story about how to produce more. The bank charges 10% interest rate. Farmers law says this all makes sense, so why not?

What does it mean that productivity increases by 20%?

Can the baker produce 48 bread now, instead 40 previously?

Or would they be able to produce 50 before, by all working a little harder, and will they now be able to produce 60? They may have been able to produce 50, but did not like to work that much harder. However, they still may prefer more bread by working equally hard or just a little more. In that case a productivity rise could mean the bakery is able to produce 60.

We will work out both scenarios and will see the conclusion for both is about the same.

48 bread

After 1 year, the baker has succeeded and produces 48 bread. What does he pay his workers? Let's assume he pays the same, so 40. In the first year the bakery will invest the 10 in the economy. This means all consumers have 10 more to consume. Possibly the baker buys a new oven from one of the consumer-workers or the consumer-workers make a new oven. Whatever. We assume here the 10 is not invested abroad, because in our simple economy, there is no abroad.

Do the people realize they got back the 10 of money saved by themselves? My answer is yes, probably. We assume consumers saved the money in order to be able to consume more in the future, by investing the money properly. If they saved the money with the purpose of keeping this money liquid and available at all times, the bank could not lend it out and the bakery could not invest the money. So, a conscious decision of the consumer-saver was required to invest the money. They could not necessarily know beforehand where the bakery would invest the money. The bakery could buy a new oven from 1 person, or the 40 consumer-producers could produce a new oven together.

Prices stay the same?

So, after 1 year the people can now buy 48 bread, and they have 50 to spend. At a price of 1 (where it was before), the consumers can now buy 48 bread. The bakery has a profit of 8, because his costs are the salary of 40. He can pay the interest charged (1) and is left with a profit of 7. However, he has to pay back the loan of 10. The sequence of events can be summarized in the table below:

Productivity to 48, Price stays 1		Salary stays 40				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and ows consumer-savers 10
1	Bakery invests 10 into the economy	48	2	8 \Rightarrow 0	1 (3)	Bakery sells 48 bread, profit is 8. Bakery pays 8 to bank of which 1 interest
2	Consumers get 7 savings back, consume 40 salary and 8 savings	48	1	8 \Rightarrow 5	1 (0)	Bakery has profit of 8, pays bank 3 outstanding loan and is left with 5
3	Consumers spend 40 salary plus 4 savings. Bank also consumes 1	45	0	5+5 = 10	0 (0)	Bakery has a profit of 10 and consumers can consume 40
4		40		10		Note: bakery is left with many bread so prices will go down normally

If this is the outcome, will the consumers who saved the money, be happy? It was their money that got invested by the bank. They can now buy 48 bread the first year, but the profit is going to the bakery.

The bank generated a small profit (the interest rate charged). This makes sense, because the banker had to make the decision and the due diligence analysis to find out if the baker could indeed increase the productivity.

The bakery generates a profit. This may make sense, because he or she had the idea how to produce more bread. In this case the bakery ends up with a very nice profit. The consumer/workers do not have the salary to buy all the bread, so unless the bakery wants to buy/consume all the bread, this economy will be left with a lot of bread. Normally speaking, this will result in a price decline.

The economy as a whole though is better off. The gains are not distributed evenly though. Most likely prices will go down.

Price down 20%

If the price goes down as much as the productivity increases, prices would go down 20%. If prices go down to approximately 0.83, all consumers can after 1 year buy 48 bread from their salary of 40. If the bakery still provides them with 30 of income the bakery will not generate any profit. The consumers will have their own 10 back and can buy 48 bread instead of 40. Consumers are very happy. But, how can the bakery pay back his loan and interest to the bank? The baker still receives 40 of income and has 40 of costs, being the salary. To decrease the price as much does not seem to be a smart plan for the bakery (and the banker). This is summarized in the table below.

Productivity to 48, Price down to 0.83 Between brackets: number of bread the consumers buy		Salary stays 40				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and owes consumer-savers 10
1	Bakery invests 10 into the economy	40 (48)	10	0 \Rightarrow 0	0 (10)	Bakery sells 48 bread, profit is 0. Bakery cannot pay the bank anything
2	Consumers can consume 40 again paid from salary	40 (48)	10	0 \Rightarrow 0	0 (10)	Bakery sells 48 bread, profit is 0. Bakery cannot pay the bank anything
3	etc.	40 (48)	10	0 \Rightarrow 0	0 (10)	Bakery sells 48 bread, profit is 0. Bakery cannot pay the bank anything
4						Conclusion: not a good deal for the bakery and banker

Prices go down 10%

If prices go down 10% consumers can initially buy 48 bread for a price of 43. The bakery generates a profit and can start paying back the bank. The table below shows the development over time:

Productivity to 48, Price down to 0.9 Between brackets: number of bread the consumers buy		Salary stays 40				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and owes consumer-savers 10
1	Bakery invests 10 into the economy	43 (48)	7	3 \Rightarrow 0	1 (8)	Bakery sells 48 bread, profit is 3. Bakery pays the bank 3 of which 1 interest
2	Consumers can consume 43 again paid from salary and savings	43 (48)	6	3 \Rightarrow 0	1 (5)	Bakery sells 48 bread, profit is 3. Bakery pays the bank 3
3	Consumers can consume 43 again paid from salary and savings	43 (48)	6	3 \Rightarrow 0	1 (2)	Bakery sells 48 bread, profit is 3. Bakery pays the bank 3
4	Consumers consume 43 again	43 (48)	6	3 \Rightarrow 1	1 (0)	Bakery sells 48 bread, profit is 3. Bakery pays the bank remaining 2
5	Consumers consume 43 again	43 (48)	5	1 \Rightarrow 4	1 (0)	Bakery sells 48 bread, profit is 3.
6	Consumers consume 43 again	43 (48)	2	4 \Rightarrow 7	1 (0)	Bakery sells 48 bread, profit is 3, cumulative profit is 7
7	Consumers consume 43 again, bank also buys 1	43 (48)	0	7 \Rightarrow 10	0 (0)	Bakery sells 48 bread, profit is 3, cumulative profit is 10
8	Consumers consume 40 salary	40 (44)	0	10	0	Good deal for bakery, banker and consumers

Are the consumers happy? In the end they have 40 of salary to spend. Given the lower price per bread they can now consume 44 bread, instead of 40 previously, presumably by working equally hard as previously. The bakery still generates 10 profit, similar to the scenario of prices stay the same. However, now, consumers can buy more. So, the gains are distributed better.

60 Bread

Let's instead assume that after 1 year, the baker's investment program has been successful and he/she is able to produce 60 bread. We hence assume that previously the bakery and the consumer-workers could produce 50 bread together. They could but did not prefer to do so and preferred instead to save. What does the bakery pay his workers? Let's assume he/she pays the same for the hard work, so 40. In the first year, the consumer-savers get their 10 savings back though. We assume again that the money invested by the bakery finds its way in the economy.

A question could be again: do the people realize they got back the 10 of money saved by themselves? My answer is again yes, probably and hopefully. We assume consumers saved the money in order to be able to consume more in the future, by investing the money properly. If they saved the money

with the purpose of keeping this money liquid and available at all times, the bank could not lend it out and the bakery could not invest the money. They could not necessarily know beforehand where the bakery would invest the money. We here assumed the money was invested in all the workers and was paid to all the consumer-workers. The invested money of 10 could as well have ended up with 1 person.

What happens to prices?

Prices stay the same

If prices stay the same, that is 1 per bread, the consumers can only buy 50 bread. The bakery generates a profit of 10, because his cost base is still 40. The baker can pay back 1 interest and 9 of the loan. The 9 paid back belong to the consumer-savers. They can use this to consume an additional 9 on top of their salary in the next period. They will probably do so, or at least want to consume more, because that was the whole idea : saving in order to be able to consume more in the future. After having spent 49 on 49 bread, in the final period they will only be able to consume their salary. The bakery has 10 profit in total. This is not the best outcome for the consumers, because they have lost their savings, which have ended up in the pockets of the baker.

Also, there is a lot of spare capacity in the economy: they are able to produce 60. The bakery is left with lots of bread. In the case of more bakeries, you would expect competition and the price to go down.

Productivity to 60, Price stays 1		Salary stays 40				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and ows consumer-savers 10
1	Bakery invests 10 into the economy	50	0	10==> 0	1 (1)	Bakery sells 50 bread, profit is 10. Bakery pays 10 to bank of which 1 interest
2	Consumers get 9 savings back, consume 40 salary and 9 savings	49	0	9==>8	1 (0)	Bakery has profit of 9, pays bank 1 outstanding loan and is left with 8
3	Consumers get 1 savings back. Spend 41. Bank also spends 1	42	0	8+2=10	0 (0)	Bakery has a profit of 10 and consumers can consume 40
4		40		10		Note: bakery is left with lots of bread from the start, so prices should go down

The final outcome is the same as under when productivity rises to 48 and prices stay the same.

Prices down 20%

If prices go down in line with productivity, so about 20%, the consumers can buy all the bread and will be happy. Because the consumers can buy all the 60 bread and pay 50, the bakery generates a profit of 10 in the first year and can pay back almost the entire loan to the bank. In an end situation consumers can buy 48 bread and the bakery generates a profit of 10. This scenario is more or less similar to a situation whereby productivity rises to 48 and prices decline by 10%.

Productivity to 60, Price down to 0.83 Between brackets: number of bread the consumers buy		Salary stays 40				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and ows consumer-savers 10
1	Bakery invests 10 into the economy	50 (60)	0	10==> 0	1 (1)	Bakery sells 60 bread, profit is 10. Bakery pays 10 to bank of which 1 interest
2	Consumers get 9 savings back, consume 40 salary and 9 savings	49 (59)	0	9==>8	1 (0)	Bakery has profit of 9, pays bank 1 outstanding loan and is left with 8
3	Consumers get 1 savings back. Spend 41. Bank also spends 1	42 (50)	0	8+2=10	0 (0)	Bakery has a profit of 10 and consumers can consume 48, going forward
4		40 (48)		10		Bakery is left with lots of bread though

A similar development takes place when prices go down 10% and productivity increases to 60 bread.

Prices down 10%

If prices go down 10%, consumers can buy 55 bread in the first year and will be happy. The bakery generates a profit of 10 in the first year and can pay back almost the entire loan to the bank. In an end situation consumers can buy 44 bread and the bakery generates a profit of 10. This end situation is similar to a situation whereby productivity rises to 48 and prices decline by 10%.

Productivity to 60, Price down to 0.9 Between brackets: number of bread the consumers buy		Salary stays 40				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and ows consumer-savers 10
1	Bakery invests 10 into the economy	50 (55)	0	10==>0	1 (1)	Bakery sells 55 bread, profit is 10. Bakery pays 10 to bank of which 1 interest
2	Consumer get 9 savings back, consume 40 salary and 9 savings	49 (54)	0	9==>8	1 (0)	Bakery has profit of 9, pays bank 1 outstanding loan and is left with 8
3	Consumers get 1 savings back. Spend 41. Bank also spends 1	42 (47)	0	8+2=10	0 (0)	Bakery has a profit of 10 and consumers can consume 40
4		40 (44)		10		Good deal for bakery, banker and consumers. Lots of bread are not bought.

What if wages go up?

We previously assumed wages would stay the same. What happens if wages go up, say 10%? Is this the same as a price decline of 10%? If wages go up, the outcome will be different though, according to me. We work out the 2 scenarios again, based on a wage increase in period 2 of 10%, from 40 to 44:

48 bread

In the first period the bakery invests 10 in the economy. The bakery can produce 48 bread, and prices stay the same. Together with the previous wage of 40, consumers are now able to buy 48 bread. They keep 2 and add this to their savings. The bakery generates a profit of 4, because now he has to pay a salary of 44. The bakery can start paying back the loan to the bank. The end situation is one where consumer-workers can buy 44 bread at a price of 1. The bakery has a profit of 6. The difference with the situation when productivity increases to 48, and prices go down 10% is that the profit the bakery generates is now 6, instead of 10 previously. Consumers can consume 44 bread in both scenarios though.

Productivity to 48, Price stay the same Between brackets: nr of bread		Salary goes up 10% to 44 in period 2				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and ows consumer-savers 10
1	Bakery invests 10 into the economy	48 (48)	2	4==>0	1 (7)	Bakery sells 48 bread, profit is 4. Bakery pays the bank 4 of which 1 interest
2	Consumers can consume 48 again paid from salary and savings	48 (48)	1	4==>0	1 (3)	Bakery sells 48 bread, profit is 4. Bakery pays the bank 4
3	Consumers can consume 48 again paid from salary and savings	48 (48)	1	4==>1	1 (0)	Bakery sells 48 bread, profit is 4. Bakery pays the bank remaining 3
4	Consumers consume 48 again	48 (48)	0	1==>5	1 (0)	Bakery sells 48 bread, profit is 4.
5	Consumers consume 44 from salary, bank also buys 1	45 (45)	0	5==>6	0 (0)	Bakery sells 45 bread, profit is 1.
	Consumers consume 44 salary	44 (44)	0	6	0 (0)	

60 bread

In the first period the bakery invests 10 in the economy. The bakery can produce 60 bread, and prices stay the same. Together with the previous wage of 40, consumers are now able to buy 50 bread. They consume all the money available. The bakery generates a profit of 6, because now he has to pay a salary of 44. The bakery can start paying back the loan to the bank. The end situation is one where consumer-workers can buy 44 bread at a price of 1. The bakery has a profit of 6. The final outcome is the same as the situation when productivity increases to 48, and wages go up 10%. A small difference is that consumers were able to buy more bread initially. The economy has a lot of unused capacity though, so if there is only a little bakery competition, prices will most likely go down.

Productivity to 60, Price stay the same Between brackets: nr of bread		Salary goes up 10% to 44 in period 2				
Period	Comment	Mc	Ms	Mbakery	Mbank	Comment
0		40	10	0	0 (10)	Bank lends (10) to bakery and ows consumer-savers 10
1	Bakery invests 10 into the economy	50 (50)	0	6==> 0	1 (5)	Bakery sells 50 bread, profit is 6. Bakery pays 6 to bank of which 1 interest
2	Consumer get 5 savings back, consume 49. Banks also buy 1	50 (50)	0	6==> 1	0 (0)	Bakery has profit of 6, pays bank remaining loan of 5
3	Consumer get 5 savings back, consume 44 salary and 5 savings	49 (49)	0	1 + 5 = 6	0 (0)	Bakery has an additional profit of 5
4	Consumers consume 44 bread of their 44 salary	44 (44)	0	6	0 (0)	Lots of bread is not consumed

Which scenario is most likely?

I don't know. This depends on the preference of the consumers. We assume the baker is in the best position to judge the consumer preference. It seems most likely that prices will go down (and wages may go up), but not as much as productivity has gone up. The difference will be the profit for the baker. How much profit he is able to generate depends on the willingness of consumers to pay a certain price for the bread and service delivered and the negotiation power of the consumers to share in the profit. Please note that in our world of fractional banking, the government and the central banks do not allow for price declines. I have never understood this, as every consumer knows, and these examples perfectly illustrate the point, that it's much easier to buy more stuff, if it's cheaper. The economy as a whole is not worse off, if we can all buy more goods. Price declines are a natural consequence of working very efficiently together.

What happens if after 1 year it turns out the investments did not pay off, and the bakery can still only produces 40? The baker has to pay back the loan and interest, but will not be in a position to do so, unless he raises the price of bread. A more straightforward solution would be for the consumer-savers just to forget about the loan and waive any outstanding obligations. In the end it's their money that was lent to the bakery. The bank will not like this, but hopefully can be persuaded to settle.

In this case $P < R$ so Farmers law was violated, but in the end no one is worse off than before. They can still buy 40 bread and have 40 salary. What was the problem? Problem is that 1 year has gone by and no one got wealthier. Time is capital. It's an opportunity loss, but it's not the end of this world.

Please note that Farmer's law would imply that in this example even with a productivity rise and price decline of 2,5%, the economy would be better off. The 10% interest is only paid on 20% of the savings. In a situation with less productivity increases there will be less chance on a lot of spare capacity in the economy. When productivity increases 20%, a situation can develop whereby too much bread can be produced. If prices go down 10% or if wages go up 10%, consumers are able to buy 10% more bread. Possibly this 10% additional consumption is more in line with their time preference, in line with the interest rate of 10%.

When money is invested productively, a new balance between consuming, saving, producing, investing and the appropriate interest and wage rate will be realised. As long as money is invested properly, all stand to benefit, probably one slightly more than the other, but then again, one also takes more risk than the other.

In the world of fractional banking, these examples will be used to illustrate how different every-one stands to benefit.

2. Fractional banking world

Let's start with the same economy of say 40 consumers who all have a salary of 1 at the bakery and have in total savings of 10. They also all consume 1 bread at a price of 1 each period, so:

$$M_c = 40 \text{ and } M_s = 10.$$

Similar to the story explained in the previous section, we summarise the development of money and consumption in the table used in the previous chapter. We now include a multiplier of 5, so $M_u = 5$. The bank can make a loan of 50 to the bakery. This way total money available is increased from 50 to 90. This is much more than under the gold-standard. Presumably with more money at hand, the bakery can increase productivity much more, say $P = 40\%$. Consumers have initially 50 of money (40 salary and 10 savings) and could decide to use all their money for buying bread. However, they decided to save 10, preferring to buy more bread in the future.

We assume the bakery is capable of producing 50 if consumers would use all their money of 50 (at a price 1 of bread). In the previous section we noticed that making this assumption, instead of the assumption that productivity increases to 48, does not make much of a difference. The consumer-workers do not necessarily work harder to produce 50 bread. However, the bakery still will provide them with a higher wage, let's say a salary of 50 for producing 50, instead of a salary of 40 for producing 40. We will see that in the end they are probably still worse off. With a productivity increase of 40% the bakery can now produce 70 bread (40% more than 50, for the same number of hours spent by the consumer workers). The interest rate R equals 10% again.

Comment/explanation	Period	M_c	M_s	M_{bakery}	M_{bank}	Comment/explanation
	1	40	10	0	0	The bank lends 50 to the bakery

In period 2 the bakery will have invested the 50. Given there are only 40 consumer-workers-savers and 1 (part-time) banker, we assume the money gets invested with the 40 consumers-workers. Some may get more (for instance, the person with a nice oven or those who are best capable of producing a new one). In any case, we assume the consumers can now consume 70 bread at a price of 1. Please note that we could also have decided in our example to lower the price of bread and keep the salary as it is. In the end it's all about the same, although subtle differences remain, as we've seen in the previous chapter. I assume here the price remains the same, because that's what the government believes is good for us (see the websites of central banks explaining how bad it would be if prices decline). Fractional banking and price inflation go hand in hand. As we will see, it's most likely prices will rise even more.

Also, do people realise they received an investment of 50 which was based on 40 money created out of nothing and 10 of themselves? If they understand fractional banking they might. Otherwise, they may believe we all got wealthier for a mysterious reason. Are they now inclined to consume more than they wished for when they had money of 50 in total? Probably the answer is yes, but not necessarily. We will come to this scenario in the next session. For now we assume they want to consume 70.

Period 2. People consume 70 of bread, the bakery has costs of 50 salary, so he has a profit of 20. He has to pay the bank though. He has to pay the notional of 50 and interest of 5. Let's assume he pays off the interest and still has to pay 35 of the loan. The bank now owns 20! Easy money. Here we assume the bank makes the 10 savings available to the consumer-savers straight away. The part-time banker can start working full-time. The bakery now owns a factory/asset which is producing a nice cash flow. In the world of equities, this equity would have value. We will deal with equities in a far later stage. It's complicated enough without equities and without a government (who we will introduce before talking about equity). This is summarized in the table below.

Period 3. Similarly, the next period consumers can buy 70 (they have grown used to this). Their salary is 50, so they need to use their savings. Please note, in the previous period savings went up. The bakery invested 50. Consumers used 30 of this to consume more and decided to save the remainder. Consumers don't mind to use their savings in this period: they choose to save and invest in order to consume more in the future. Part of the savings was lent out by the bank (the 10 original savings), but the bank has returned this money already. The bank could decide to start buying bread already. If they would, the price of bread would go up. We assume they won't yet (in order not to overcomplicate our example). This will happen in one of the next periods though.

Period 4. The next period the bank decides to consume 10 as well. Consumers can now only buy 60 bread, given their salary of 50 and savings worth 10. With the bank consuming 10, total consumption remains 70. The bakery generates another profit of 20, and can entirely pay down its debt. The bank owns 35, the bakery 5 and the consumers 50. Total money available is 90. If consumers want to consume 70 again, they need higher wages, because they have run out of savings. We here assume wages remain the same.

Period 5, no wage increase. If all participants want to buy all the bread, the price of bread will go up. We here assume it doesn't. Consumers can buy 50 bread, the bank can buy the remaining 20 bread and the bakery generates a nice profit. Consumers are for now not worse off, but also, not better: They can buy 50 bread, as before. If prices would go up, they would feel poorer though. In reality this is most likely to happen. This is what upsets the Occupiers: consumer-workers keep on working hard, but feel rightfully so they are getting poorer.

In period 6 the bank consumes their remaining 15. The bakery generates a profit of 15, which results in accumulative profit of 40. Consumers have 50.

In period 7, consumers are not worse off, as mentioned before. But more importantly, they are also not better off, despite the investment and productivity increase of 40%. The economy as a whole is better off though. If consumer-workers own the bakery for instance, and would be paid a dividend of 40, they would have 90 of money. If prices rise 28,6%, they could buy 70 bread of 90 money.

Productivity to 70, prices stay 1, wages go up to 50, R = 10% so 5 needs to be repaid as interest						
Comment/explanation	Period	Mc	Ms	Mbakery	Mbank	Comment/explanation
	1	40	10	0	0 (55*)(10)	The bank lends 50 to the bakery
	2	70	20	20 ==> 0 (equity is worth something)	10 (35)(0)	The bakery generates a profit of 20 and pays 20 to the bank, of which 5 interest. Bank can give savings back.
Bank receives 5 interest and keeps another 5.	3	70	10	20 ==> 0	30 (15)(0)	The bakery generates 20 of profit and pays the bank. The Bank does not consume yet
But bank will now consume 10 savings and we assume bank buys 10.	4	60 +Mc Bank 10 =70	0	20 ==> 5	35 (0)(0)	The bakery generates a profit of 20 and pays the remainder of 15 to the bank.
Banker buys 20 of new bread, no wage increase,	5	70 (70 bread, consumers buy 50)	0	5 ==> 25	35-20=15	Prices could go up in practice, if all the money would chase the 70 bread
Bank consumes another 20	6	65 (consumers buy 50)	0	25 ==> 40	0	Consumers have 50, profit of bakery is 40. Price of bread should come down if it went up in period 4 or 5
Consumers consume 50 salary	7	50 (50?)	0	40	0	

The formula used to describe Pm would say that the inflation due to the printing of money would be around 80%. Productivity has increased 40%. $1.8 / 1.4$ equals 26,8%. Prices would go up less and be reduced because of the increased productivity. On balance, prices could rise somewhat in between. Our example describes just one price, consumption and profit pattern.

In any case, since Farmers Law was not violated the economy as a whole is not worse off. The bank and the bakery stand to benefit. The wealth got possibly spread unevenly in our example. If the bakery distributes the profits back to the consumers it may not be that bad after all. This could also be realized by a wage hike.

The banker got paid very well for the service offered. Probably too well: the bank could buy almost as much bread as the consumer/workers, although they really didn't do anything. This is what upsets the Occupiers in 2011. They see people working hard, but not able to consume more. They see people working harder, but still getting poorer.

Please also note, that the economy really took off in period 2. For sure people would describe this as an economic miracle, such as the Asian tigers in the 1980's.

It's also easy to see that this growth is accompanied by price inflation in first instance.

It's also easy to see that the equity value of the bakery, if this was a listed company, would go up very nicely. If the bank was listed, the same would happen. If we want the consumers not to be worse off, the equity value will have been reduced to 0. Again, we will come back to equity prices later.

What would however happen if productivity does not increase at all?

Let's start from the beginning again. $M_c = 40$ and $M_s = 10$ and the multiplier equals 5, so $M_u = 5$. The bank can make a loan of 50 to the bakery. Presumably with more money at hand, the bakery can increase productivity much more. But the bakery fails. This can always happen, so say $P = 0\%$. We again assume the bakery could have produced 50 if consumers would use all their money of 50 (at a price 1 of bread), and again also at a higher wage, let's say a salary of 50 for producing 50 in period 2. With a productivity increase of 0% the bakery can now still 50 bread. The interest rate R equals 10% again.

Comment/explanation	Period	M_c	M_s	M_{bakery}	M_{bank}	Comment/explanation
	1	40	10	0	0	The bank lends 50 to the bakery at 10%

In period 2 the bakery will have invested the 50. Given there are only 40 consumer-workers-savers and 1 (part-time) banker, we assume the money gets invested with the 40 consumers-workers. Some may get more (for instance, the person with a nice oven or those who are best capable of producing a new one). In any case, the consumers can now still consume 50 bread at a price of 1.

Period 2. People wanted to consume at least 60 (according to Farmer's Law, do not make an investment if the productivity increase is not sufficient). There is now an ample amount of money chasing too few goods. In the previous example we assumed no price hike in first instance though. So, we do not assume a price increase now either. The bakery cannot pay the bank anything. Consumers buy 50 bread at a price of 1. The bakery has costs of 50 salary, so he has no profit.

Periods 3: with wages down to 45, consumers have to start eating their savings in order to buy 50 bread. The bakery generates a profit of 5 and can start paying back the bank slowly but surely.

Period 4- 13. Similarly, the next periods consumers can buy 50. After the last period their initial savings of 10 and the savings after the investments from the bakery, have been depleted. Going forward they can only buy 45 bread. The bank can now start buying bread as well.

It's most likely the bank would have been started buying more bread during period 4-13. In that case prices would have gone up. The formula used to describe P_m would say that the inflation due to the printing of money would be around 80% over time. This example describes just one price, consumption and profit pattern. In any case, consumers would now be worse off and would definitely feel poorer for a long time. It takes a long time to overcome this malinvestment. If in the end the banker would return the money to the consumers, they could buy 50 bread at a higher price. In that case, the whole episode was unfortunate, but no one got poorer in the end. However, that's not how the world is organised.

Please feel free to modify the story as you believe the economy should develop. I believe that in all cases the consumers are worse off, because of the money created out of nothing.

Productivity stays 50, wages go up to 50, prices stay 1, R = 10% so 5 needs to be repaid as interest						
Comment/explanation	Period	Mc	Ms	Mbakery	Mbank	Comment/explanation
	1	40	10	0	0 (55)(10)	The bank lends 50 to the bakery
	2	50	40	0	0 (55*)(0)	The bakery does not generate a profit and cannot pay the bank.
Bakery has to reduce wage to 45?	3	50	40	5 ==>0	5 (50)(0)	The bakery generates 5 of profit and pays the bank the interest. The Bank does not consume yet
Consumers have salary of 45 and use their savings to consume 50	4	50	35	5==> 0	10 (45)(5)	The bakery generates a profit of 5 and pays this to the bank.
	5	50	30	5==>0	15 (40) (10)	Bank can make savings of 10 available again
	6	50	25	5==>0	10 (35)(0)	
	7	50	30	5==>0	15 (30)(0)	
	8	50	25	5==>0	20 (25)	
	9	50	20	5==>0	25 (20)	
	10	50	15	5==>0	30 (15)	
	11	50	10	5==>0	35 (10)	
	12	50	5	5==>0	40 (5)	
	13	50	0	5==>0	45 (0)	
When bank decides to consume (from period 4 onwards) price will go up and consumers can buy even less bread. We assume here bank buys all bread, price up	14	45	0	0	45	

Governments and labour unions do not like wages going down. In that case, the bakery cannot do anything else that to fire people in period 3. This will cause unemployment. After the initial growth in the economy, there is a 'cooling down'. The more prices and wages are able to adjust freely, the sooner the economy can heal. In this example it takes a while, but nonetheless, it does.

In this case the economy cools down because too much money has been created and money was not invested properly. A similar event would develop if productivity only increases a little. This is what Farmer's law is about. In any case, the economy cools down, and the government is inclined to step in. Why? Because this is what Keynes told them. Also, because with unemployment the government will not be re-elected. Even though they could not help it directly: the baker was just unfortunate enough to make a bad investment. Obviously, if the government had sent him to a better school, this would not have happened. But I don't think that's the point here.

In the next chapter we will explore the consequences of a government, keen to stimulate demand, entering the scene.