

# Technology, Capitalism and Habitat Segregation Theory

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## 1. Traditional capitalism

We think that capitalism is born in Europe and spread all over the world. Is this right? Did Europe put out it truly? Why could not other civilizations produce capitalism?

Capitalism, Karl Marx said, is a system in which a rich capitalist gathers many poor labors in a factory, makes vast industrial products and makes a profit. A part of profits is re-invested one after another. The capitalist's gain is growing but labors are "exploited". This system needs capitalists on the one hand, many labors on the other hand who live only on wages.

Peasants in feudal Europe were not wage earners. They were a sort of land owners, even if they had to pay rent to their lords. We can say the same about masters, craftsmen, apprentices in the handiwork. In the feudal era there was not an open market in principle. So it needed the collapse of the feudalism. This is an explanation in a standard textbook.

But capitalism existed from ancient civilizations. Merchants bought products and sold them, and made a profit. An open market was important for the merchants. In China or the Islamic world, there were open markets. Merchants made a profit on trade. Merchandise was natural products mainly: for example spice, but not industrial products apart from handicraft. This is also capitalism. From ancient civilizations, there was an open market system. In Europe there was a limited open market from 12<sup>th</sup> century in Italian cities particularly. This is the traditional capitalism.

## 2. Modern capitalism and the industrialization

On the other hand, capitalism since the 18<sup>th</sup> century Industrial Revolution is different, in which merchandise is first thing an industrial product by machinery, not natural one or a handwork and then they are made by many wage labors in a factory. This is the modern capitalism. The existence of many wage labors is important in the modern capitalism. They existed only a small number in the traditional capitalism.

By the way, is the industrialization different from the modern capitalism? The modern capitalism needs a place of getting materials and a market to sell industrial products. These are better abroad than at home to increase more profits. Profits are returned to capitalists, and to labors at home even if a little. It is the industrialization to succeed in making this system. An industrial country had capital as machines and technology, and wage labors at home. It could produce many industrial

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products and get profits from foreign countries.

Why does the industrialization make a profit? An exchange of the farm products was difficult to take more profits. But industrial products can get much profit. England, for example, bought cotton from America, India and Africa. Suppose that 1 kilogram cotton is 1 pound and a cotton shirt made in England is 5 pound. If England sell it to America, it gains 4 pound profits. So the industrialization yields profits, but non-industrial countries remain poor. Therefore America had to be industrialized. Non-industrial countries are only “exploitation places”, which, however, are connected with industrial countries. In the modern capitalism there are industrial countries=winner and “exploited” countries=loser inevitably.

In the 19<sup>th</sup>- and 20<sup>th</sup> century, the losers were colonies and semi-colonies in Asia, Africa and Latin America. Winner? West Europe and United States. After the independences of the colonies remained the situation almost unchangeable.

England was industrialized from 18<sup>th</sup> to 19<sup>th</sup> century over one hundred years gradually. Late starters achieved more rapidly. Germany and United States began industrialization from 1870s and caught up with England in production by the end of 19<sup>th</sup> century. In the industrial countries of Europe and United States population concentrated in cities, and railways and infrastructure were built, public health improved, and wage labors became also shared in a part of wealth. Life in the industrial countries became affluent.

### 3. Technology and capitalism

The modern capitalism or industry is supported by the development of the technology. European civilization is the world of modern capitalism and technology. Why die capitalism and technology make a rapid progress in West Europe? And why did the Industrial Revolution occur in England?

There were machines and technology since ancient civilizations: a wheeled vehicle, a waterwheel, a windmill, printing, papermaking, a mariner’s compass, a mechanical clock etc. Coke, that is refined coal, was used earlier in China and the iron industry by coke in the 11<sup>th</sup> century China produced the same amount as those in England of circa. 1700. Bellows was used for the ventilation to burn coke till the invention of the steam engine. A spinning machine and a big clock machine by water power were also invented in the era of Song dynasty China. A junk with the mariner’s compass was the strongest ship in the world. The invention of the steam engine preceded England 300 years before in the Ottoman Empire<sup>(1)</sup>.

### 4. Habitat Segregation Theory <sup>(2)</sup>

Why did the technology and capitalism much more developed in West Europe? I explain it with the Habitat Segregation Theory: Habitat Segregation of power, Habitat Segregation of city market and Habitat segregation of wealth.

There were many kings and lords in Europe historically. A power was weak relatively compared with China or the Ottoman Empire which were centralized by emperor power. In Europe powers were scattered. There were many powers: not only kings, but also noblemen, churches, monasteries,

cities. Moreover social groups as Parliament and guilds had each a power. Powers of kings were not always strong. For example a French king dominated certainly France, but couldn't lay tax on total France. Lords had taxation rights and lord-courts. An authority of the king lay on the agreement among other social powers. When Louis the 14<sup>th</sup> neglected them, "absolutism" began. Then the relation between the king and other social groups became out of balance, the French Revolution occurred. In Germany there coexisted circa. 300 land powers in the Holy Roman Empire. These situations are Habitat Segregation of power.

Habitat Segregation of power brought Habitat Segregation of wealth. Even kings of France, England or Holy Roman Emperor were relatively "poor". They borrowed money from big merchants usually. I can say examples<sup>(3)</sup>: in 1519 Karl V borrowed money for the election to the Holy Roman Emperor from the Fugger family of Augsburg. It was not Spain and Portugal but Italian merchants that financed Columbus or Magellan. The royal treasuries were usually in the budget deficit. France was on the verge of the bankruptcy in 1492. Debt took 15%-20% of the national budget in the 18th century. Wealth wasn't centralized to the king power. This meant that wealth was flowed to the other social groups.

Moreover city markets were scattered in Europe. This is Habitat Segregation of city market. In the Islamic world and China, there were open markets certainly, but the number of city (market) was relatively small. The function of a market concentrated in a few big cities. These cities had a half- and a million population. Bagdad and Hangzhou in the 10<sup>th</sup>/11<sup>th</sup> century each was a million city. European cities were a striking contrast. There were very small cities which had only less than ten thousand population. Only Paris, Napoli, Venice and Milan had a hundred thousand population in the later 15<sup>th</sup> century. Thousands of cities were scattered. So people could get wealth relative easily in the city market. Habitat Segregation of city market brings Habitat Segregation of wealth.

Habitat Segregation of wealth meant that everybody had a chance to get wealth. This was a favorable condition for the development of the technology and capitalism. If someone invents a good product, he can make a profit. The more markets, the more chances. Anyone wouldn't try to invent a good product without no profit. There were so many markets where craftsmen could make a profit on a good product in spite of the control of the guilds. Merchants would buy a best product between craftsmen in many cities. Moreover there were craftsmen in the rural areas that wasn't under control of the city guild. A political power would buy a better firearm.

In Europe, many city markets, even if small, were located near the village-community. This meant that village people had also a chance to take wealth from a city market. In Germany, France and England, a city market existed in 2~3 square miles (one mile=ca. 7.5 square kilometer)<sup>(4)</sup>. Village people could get wealth. This would stimulate rural industry.

## 5. Abolition of the violent exploitation system

A violent political power hindered the development of the technology and capitalism occasionally. In the Ottoman Empire a printing factory was closed by the emperor because it might spread a dangerous ideology. In Ming dynasty China a voyage abroad was prohibited and a shipyard closed.

Merchants became impossible to trade abroad at least officially<sup>(5)</sup>.

A factor that Europe overtook China and the Islamic world was the abolition of the violent exploitation system: Netherlands in the 16<sup>th</sup>, England in the 17<sup>th</sup>, France in the 18<sup>th</sup>, others in the 19<sup>th</sup> century. The violent exploitation system was feudalism on whose top lay kings. Netherlands drove Hapsburg Spain away. England executed and banished the kings. At last the violent exploitation system was abolished by the French Revolution from all over Europe totally. This would contribute to the development of technology and capitalism.

Why did succeed in the political revolutions? It is Habitat Segregation of power. Powers were the king on the one hand, social groups as churches, guilds, companies, universities, clergy, nobility, cities etc. on the other hand. A social group had a certain degree power. Suppose that here is a seesaw on which the king sits on the one hand, social groups on the other hand. It must balance in feudal Europe. The Parliament that consisted of clergy, nobility and city-bourgeoisie was stronger among the social groups. When the balance of the king and the Parliament lost, the revolutions broke out. This was the consequence of Habitat Segregation of power in Europe.

## 6. Development of the firearms

Europe overwhelmed other civilizations by firearms. Why did firearms developed only in Europe. This was also consequence of the Habitat Segregation.

Powder was invented in circa.7<sup>th</sup> century China. Between the 10<sup>th</sup>- and 13<sup>th</sup> century black powder of sulfur, saltpeter and charcoal, and a prototype of the canon were invented. A prototype of the hand grenade also. In 1259 Southern Song used primitive guns against the Mongolian army. The bronze gun with a leaden bullet was used in 1288 China. In the 14<sup>th</sup> century China firearms in the wars were common<sup>(6)</sup>.

In the Song era the nobility fell down and power was centralized to the emperor but the society was democratized, even a peasant could rise up his social position. An open market and free trade flourished and capitalism developed. The technology also. In the era of Song and Yuan dynasties China the technology yielded money. It was an exceptional era in China.

Powder and firearms came to Europe via the Islamic world. The Islamic army used a prototype of the canon in Spain in 1188<sup>(7)</sup>. It was in the age of the Hundred Years War (1339-1453) that canons and matchlock guns appeared for the first time in Europe. In those days the Ottoman Empire had big canons by which they attacked Constantinople. Until the 16<sup>th</sup> century there was no difference between the west- ant east world.

From 16<sup>th</sup> century Europe began to precede. Weight of the canon became light and it was mobile rapidly by the cart with wheels. An iron bullet was used instead of the stone. A flintlock gun was invented. A first article with artillery was written. Certainly firearms weren't decisive yet and the army was reliance to the spear and crossbow, but Europe was eager in the improvement of firearms in contrast with China or the Ottoman Empire since 16<sup>th</sup> century. And wars became very frequent in Europe (Habitat Segregation of power) and Europeans began to go abroad. The demand for firearms increased (Habitat Segregation of wealth). In the latter half of the 18<sup>th</sup> century a rifle and a shotgun

were invented, even if firearms had weak points: rain, time to firing and hit.

It was in the 19<sup>th</sup> century and in the latter half in particular that firearms progressed rapidly: for example revolver in 1835 and Armstrong Gun in 1855. The invention of the machine gun in 1880s was decisive.

Certainly from 16<sup>th</sup> to 19<sup>th</sup> century firearms attacked only the coast of Asia from ships on the sea. Europe couldn't go into the inland. But it was only Europe that developed firearms for over 400 years consecutively.

At first the technology and information with powder and firearms were kept secret by a artillery guild. The guildsmen were employed and came into the battlefield. The artillery was formed as a regular member of a national army just in the early 19<sup>th</sup> century<sup>(8)</sup>.

Artillerymen were by nature craftsmen who were free employees of any power. Since 16<sup>th</sup> century there were many demands for artillerymen. They had to improve the technology. A good job made a profit. A better made more. This is the consequence of the Habitat Segregation of wealth.

## 7. Why did the Industrial Revolution occur in England?

The Industrial Revolution in the 18<sup>th</sup> century England changed an economic system on the base of the agriculture and handiwork. New economic system was production by machinery<sup>(9)</sup>. The Industrial Revolution brought the modern capitalism.

The technology and machinery existed from ancient civilizations, but it was decisive that the industrial production by machinery became the main stream in the economic society permanently. This is modern world.

What needs to develop machinery, that is, technology? Firstly there is a good market (demand) for the industrial products. Secondly it is important that a political power doesn't hinder markets. In the era of the development of technology in the ancient civilizations or medieval China, there were these conditions but later conditions were hindered.

I explain why England could begin the Industrial Revolution in two ways: the political revolution and Habitat Segregation of wealth more than other European countries. First: England removed oppressive political powers in the 17<sup>th</sup> century (the English Revolution) and therefore free markets for the commerce and industry was built. In the 17<sup>th</sup> and 18<sup>th</sup> century France and Germany there remained feudal societies and the oppressive political powers inclusive of the kings hindered free markets more or less. There remained the monopoly by guilds for example. A peasant couldn't go into business without the approval of the lord in principle.

You may think that the Industrial Revolution might occur in the Netherlands because the oppressive political powers were abolished here earlier. There was not feudalism. But the Netherlands couldn't go beyond the traditional trade capitalism.

In 17<sup>th</sup> century England there wasn't the manor system, no monopoly by guilds, no tolls by the lords or kings etc. It was easy to change occupations. To do more than one job simultaneously was possible. Cities increased after the Civil War and population in cities more than 5,000 became 15% in the middle of 18<sup>th</sup> century and 20% in 1800, in contrast with 10% of France just before the

French Revolution<sup>(10)</sup>. Moreover there were more handicraft industries in the villages. The spinning- and textile industry in the villages developed more than in the continental Europe. City-village trades were active. Income inequality between social groups in England was smaller than in the continental Europe. Wealth was more mobile. There was more Habitat Segregation of wealth than the continental Europe.

## 8. The process of the Industrial Revolution

Why did the Industrial Revolution with not wool or flax, but with cotton fabrics begin? There were more demand for the cotton goods. Cotton fabrics which were imported by the East India Company were comfortable to wear and popular. They were easy to wash and the price was convenient. Therefor craftsmen in England began to try producing cotton fabrics by themselves. Moreover cotton was more suitable for machines than wool because the fibers were stronger and homogeneous<sup>(11)</sup>.

Why was a steam engine not only invented, but also continued to improve? It is said that the most result of the Industrial Revolution was iron manufacturing by the steam engine. But in those days a demand for iron in England wasn't always more than in the other European countries. Iron manufacturing was not the motive, but the consequence of the Industrial Revolution. The invention and the improvement of the steam engine were stimulated by mechanization of cotton industry. There was the spread of the craftsmen's interest in machines in the 18<sup>th</sup> century England. They believed that machines brought wealth.

In 1709 Abraham Darby I made iron by coke but the iron manufacturing by coke didn't spread until the latter half of the 18th century. A ventilation to burn coke was a problem. The bellows were insufficient. Thomas Newcomen made a steam engine in 1705. But this was only used for draining water in a mine. James Watt improved a steam engine and was used for the ventilation to burn coke at the first time in 1775. A spinning machine began to use a steam engine in 1785. In 1825 an automatic spinning mule was invented.

Iron was imported in the 1750s England but in the beginning of the 19<sup>th</sup> century England exported iron. The production of the iron in ca. 1850 increased in ca. 160 times compared with ones in 1740<sup>(12)</sup>. The Iron and the steam engine became a symbol of the Industrial Revolution. And railways and steamships.

The Industrial Revolution of England was a history of over one century for the invention and improvement of machines. In this way the technology meant mechanization. The continued mass production by machines and sales became the main in the modern economy.

## 9. Conclusion

European civilization was (is) the technology and capitalism. These two factors existed since the age of the ancient civilizations. But they moved each and was separated. In the modern world the technology and capitalism were interlocked. They become one flesh. Habitat Segregation in Europe caused this phenomenon.



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