

The Market Triple as a New Tool in Economics

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Abstract. *Many economists argue that we need a reappraisal of some of the dominant ideas in economic thought for a much better understanding of how modern (market) economy works – and why in key ways it now doesn't. Following this path of reasoning, I define the concept of a market as general as possible and claim that each market beside its own demand and supply has its own organizer, who regulates its activities. These three market actors are connected by formal and/or informal relations specific for each market, what can be pictured as a triangle, called the market triple.*

To demonstrate usefulness of the market triple concept, an analysis of labour market in both its present stage and its historical development is presented together with two main conclusions. First, today, labour market is the most overregulated market and the demand for routine labour is shrinking as an unavoidable result of socio-economic development, while the demand for creative work is rising. Therefore, the full employment among routine workers is impossible. Second, among all markets, the labour market has passed the most revolutionary changes, what can be shown by an evolution of its market triple.

Similar applications of the market triple to the case of money market and goods market are briefly discussed. In conclusion, this new approach to an economic analysis is compared with the classical one.

Keywords: Market triple; Labour market; Overregulation of labour market; Unemployment; Minimal wage; Money market, Goods market.

1. Introduction

In public debate, many economists (see e.g. [Jacobs and Mazzucato, 2016](#); [Mazzucato, 2016](#), [Piketty, 2014](#); [Stiglitz, Sen and Fitoussi, 2010](#); [Stiglitz, 2016](#)) argue that we need a reappraisal of some of the dominant ideas in economic thought for a much better understanding of how modern economy works – and why in key ways it now doesn't. Following this path of reasoning, I suggest first a redefinition of such a very basic concepts as market and value, and next I demonstrate usefulness of my approach in an analysis of labour market. Then I briefly show that both money market and goods market can be analyzed in a similar way. These three main markets were studied by [John Maynard Keynes](#) in his famous book *General Theory of Employment, Interest and Money*.

Following Keynes's idea, Figure 1 presents a model of a modern market economy as an interaction of three **main markets: money market, labour market**, and market of goods and services, in short called **goods market**. Each main market is represented in Figure 1 by a full circle to point out that we consider all issues connected with that particular market. Since

all main markets are of the same importance in our considerations, then we picture them in Figure 1 as circles of the same size.

Figure 1 **Market economy as an interaction of three main markets**

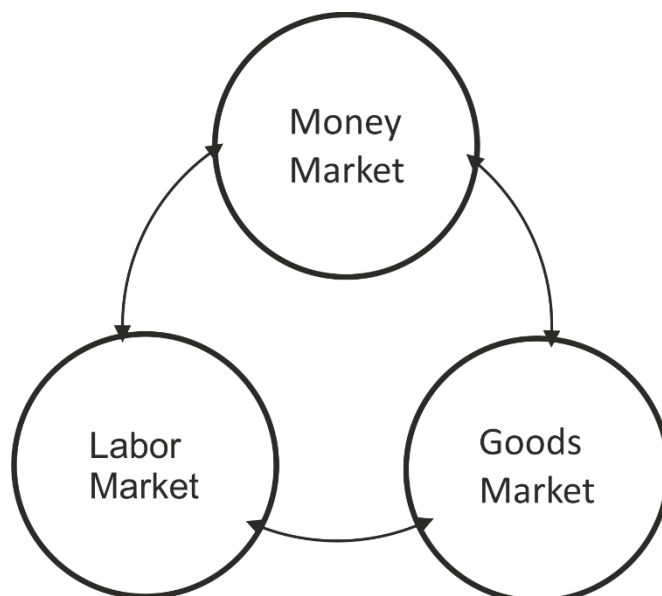


Figure 1 shows that each main market is under influence of the two remaining main markets, and *vice versa* it influences the two remaining main markets. Money, goods and labour are circulated between these three main markets in both direction – clockwise and anticlockwise – and no direction is distinguished as more important in our model of market economy.

Market economy can be considered as a composition of, practically speaking, infinitely many different markets. In Figure 1 we distinguish three of them to point out that the remaining ones are of the secondary importance, and we simply disregard them at the first stage of our analysis (Sections 4 and 5). Rules of the market game between demand and supply guide us through life from birth (market for Pampers) to death (market for funeral services). Thus, markets are everywhere, and to study them, more precisely the rules of the demand-supply game on different markets, we need a general and precise definition of this concept. Any (free) market transaction is realized when the value of demand equals the value of supply. Hence, a popular saying ‘Demand equals supply’ is a shorthand for the previous sentence. Therefore in Section 2, I redefine two very fundamental and tightly connected concepts of market and value.

Economics can be considered as a science about how the equilibrium between demand and supply on different markets is reached. Then, it is natural to ask who sets the rules of that market game between demand and supply? Answering this question, I introduce a concept of an organizer of a given market, who sets and executes the rules taking into account law, regulations, tradition, etc. existing here (on a given market) and now (at present). In our study of a given market, we divide all its actors into three groups: demand, supply and organizer. We note that in some market certain groups can be identical. For instance, on the forex (foreign exchange) market, investors, called traders, almost simultaneously sell (supply) or

buy (demand) currencies. Thus on the forex market, the demand is identical with the supply, i.e. traders are acting on its both demand and supply side. This observation is in a sharp contrast to a typical green (farmers) market, where people either come to buy (demand) or to sell (supply). A remark that can be a vendor who buys something on his/her green market, we treat as an exception that proves the rule of a sharp boundary between vendors and shoppers, even window shoppers on the green market.

I claim (Walukiewicz, 2014) that each market beside its demand and supply has its own organizer, who sets and executes the rule of its demand-supply game. These three market actors are connected by the market specific formal and/or informal relations, what can be pictured as a triangle, called the market triple, to be defined in Section 3. Next, I analyze the labour market to point out the differences between my approach and the classical one presented in economics textbooks (see e.g. Mankiw, 2012, Chapter 7). Section 5 describes in brief a similar approach to the money market and goods market as two remaining main markets shown in Figure 1. Since in general case, the market triple is a two-dimensional triangle and it plays a key role in economic considerations, then I call my approach **two-dimensional economics** (Walukiewicz, 2015). In conclusion, I compare two-dimensional economics with the classical one, called by me **one-dimensional economics** because the relation demand-supply can be pictured as an one-dimensional segment.

2. Two basic concepts

To avoid misunderstandings, a remark is in order at the beginning. I claim that only people as unique living organisms on the earth can form (build, modify, etc.) different markets. This remark is necessary to remove a false impression connected with so called high frequency trading (HFT) where sophisticated and powerful computers sell and buy stocks at stock exchange. Computers are not main actors at the demand-supply game because skilled people program such computers to set or modify the rules of the market game involved, leaving computers the role of nothing but tools in it. In fact, people have been building markets from a very beginning of humanity and the HFT at stock exchange or the forex market represents today's level of market technology, and nothing else.

Already stated, we need a very general and precise definition of this concept. I define a **market** as a set of rules of a demand-supply game, approved as (1) fair, (2) reasonable and (3) adequate, and regulating how a very deep truth – demand equals supply – should be understood on a here and now basis.

It appears that condition (3) is critical to this definition. A set of rules is **adequate** if the number of rules is exactly as needed or its cardinality equals the minimum number of rules necessary to make the activity (game) of a given market workable here and now. The situation when there are not enough rules seems controllable. As life pushes on, there will always be market actors (people) to catch up and add the missing regulations or procedures. So under regulated markets, with the number of rules less than needed, do not exist. The opposite alternative is very challenging and often can be met in contemporary economy. In Section 4, we will discuss how to cope with the overregulated labour market. The market rules are **reasonable** if they can successfully stand a test of a legal trial here and now, for

example, a lawsuit on a property market between a home buyer and a developer. Meanwhile, since referring every market transaction to the court is impractical, unrealistic, and also foolish, therefore **fairness** is added as the first condition of market rules. Obviously, **fair** means fairness on a here and now basis.

I constantly use the ‘here and now’ phrase to point out that the rules, regulations, procedures, etc. of the market game are not stable over space (here) and time (now), and name ‘demand equals supply’ a very deep truth because it is valid over all possible markets (space) and over time. In fact, any market works in equilibrium, when its demand equals its supply. But it is a dynamic, not a static equilibrium. The difference between demand and supply, however measured, is not constantly zero, but fluctuates around zero over time. Thus on any market, the static equilibrium (the zero value) is constantly crashed and rebuilt. Therefore, the sentence ‘demand equals supply’ is the here and now equality because its meaning depends heavily on the market as a such (here) and time (now). Consequently, a market, understood as general as possible, is the here and now concept – a set of rules for the demand-supply game good here and now, not necessarily will be such there and then. We will return to this question at the end of the next section.

In other words, a market, defined as general as possible, is the most universal mechanism for comparing values, the value of the demand with the value of the supply. This mechanism is constantly tuned up by market actors taking into account existing law, tradition, experience, etc. Thus, values cannot be compared outside an appropriate market.

Consequently, anything in the world has its own value defined or assessed on an appropriate market. I do not purport, though, that all present valuations are correct and will consider market failures at the end of the next section. I note that it is hard to forge a one-line definition of ‘value’, just as it is hard to tersely define ‘time’ or ‘quality’ (though we all know too well what ‘lack of time’ or ‘lack of quality’ is). Thus finally, I define a **value** as an economic equivalent of anything around the world defined or assessed on an appropriate market.

This definition may be interpreted using so-called **economic scales**. If an apple costs one dollar here and now, then the economic scales are balanced if we put that apple on one side and a dollar bill or four quarters or ten dimes, etc. on the other. This means that one dollar is the economic equivalent of the apple here and now. To be precise, we have to use the here and now phrase because the price of that apple can be completely different on the other green market (there) as well as at the other moment of time (then). Materially, an apple is heavier and occupies more space than a dollar bill, in which lies the difference between the economic equilibrium and the physical one.

This definition also expresses common knowledge that the value of almost anything in the world is the amount of money – we call it ‘economic equivalent’ – that someone is ready to pay for it on a relevant market. So the value of a given ‘inventory’ (item, idea, etc.) cannot be assessed outside its market. If we would like, for instance, to measure the extent (or the value) of welfare of a given country (Stiglitz et al 2010), we need first to construct a model of,

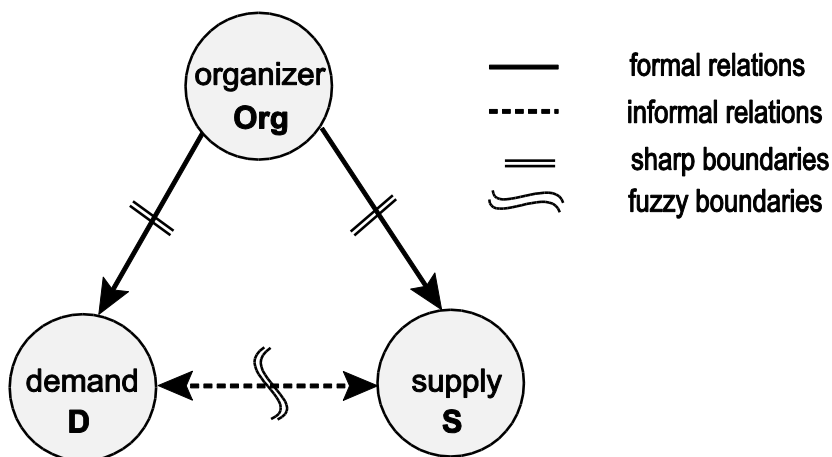
say, domestic welfare market that will include all the country's resources (assets), be they tangible or intangible. Then the question, how this appropriate market looks like naturally arises. We answer it according the principle from general to particular in the next section.

3. The market structure

Studying different markets, I note that each market beside its demand and supply has its own organizer (people or institution set up by people) who sets and executes the rules of its demand-supply game taking into account law, regulation, tradition, etc., and last but not least economics as a science about an equilibrium on different markets. These three market actors are connected by formal and/or informal relations between them, forming a triangle called the market triple. Thus, a **market triple** consists of the three constituent elements acting in a market game: demand (D), supply (S) and organizer (Org), as well as formal and/or informal relations among them.

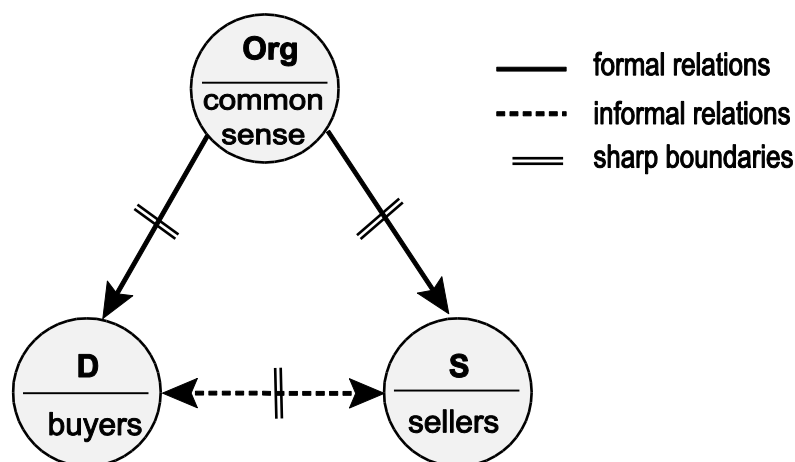
My paper (Walukiewicz, 2014) suggests a graphical representation of the market triple, shown in Figure 2. As the provider of the game, the organizer (Org) is placed above the DS base. Circles are used for vertices instead of points to enter names of particular market actors. Formal and informal relations between a pair of vertices are pictured as solid lines or dashed lines, respectively. The demand (D), placed in the bottom left corner, plays a creative role in the demand equals supply equation, as people first think, dream, visualize, etc. a purchase and then complete it should they have sufficient funds. It corresponds to the lesson learnt from physics: action first, then reaction. Furthermore, when mathematical equations are constructed, the unknowns go to the left (idea of purchase not yet concretised) and constants to the right side of the equality sign (purchase materialised). Hence, and in accordance with the way a text in e.g. English is read, demand (D) is always on the left and supply (S) on the right at the base of the market triple.

Figure 2: A universal model of the market triple



Let us take as an example a green market existed from the very beginning of humanity. For centuries, the organizer (Org) of a green market has been nothing but common sense, telling people where and when to organize a fair, how to put up stalls, make them accessible to customers (demand D) and easy to operate by sellers (supply S), etc. Today's the organizer may operate within an organizational framework, supported by e.g. the local administration, police, fire safety officials. Among other duties, the organizer regulates the activity of buyers and sellers. So the relations between the organizer and demand or supply are formal as exhibited by solid arrows from Org to D or S in Figure 3. Someone buying a kilo of apples does not sign a formal contract with a seller; there must be a certain amount of trust between them where trust probably should be ranked as the most important informal relation between people. Then, people come to fair not only to buy but also to chat with each other or a vendor. So relations between demand (D) and supply (S) are informal – see double arrowed dashed line as a base of the market triple in Figure 3. The boundaries between the organizer, demand and supply, respectively, are sharp (straight double crossing lines in Figure 3) as their roles in a green market are sharply different.

Figure 3. **The market triple of a green market**



The market triple of a green market looks like an equilateral triangle. One may doubt at this point that boundaries between demand and supply are sharp enough because a seller may sometimes buy something in his/her marketplace. In fact, it only proves the rule of a green market here and now. As anyone, a buyer or seller comes and acts in a green market as a free, conscious and fully responsible individual, and then he/she agrees that its rules are fair, reasonable and adequately account for the equality of demand and supply here and now.

Any market is a social phenomenon where at least two individuals, completely free in their (market) decisions, exchange goods, services, ideas (e.g. patents), emotions (market of political or sports emotions), etc. I suggest considering it from a social capital (see e.g. [Arrow, 1999](#); [Putnam, 2000](#), [Robinson and Ritchie, 2010](#)) perspective by providing a new methodology for the study of both its financial and social network or topological aspects.

In the previous section, it has been shown that people only can build or modify markets, understood as mechanisms for a **here and now evaluation** of everything in the world, and no any other living organism on the earth can do that. Then, as a consequence, only people are responsible when a given market fails, what means that its evaluations do not fulfil the three conditions mentioned in its definition. It is interesting to note that the rules of demand-supply game over all markets contain the claim: '**Market means responsibility.**' Saying it differently, a given market fails when people acting as its **organizer** or as its **demand** or **supply** do not have sufficient imagination, political will, dedication and so on to take care (be responsible) about the rules of its demand-supply game on a here and now base. With some exaggeration, I claim that a given market fails when people are not sufficiently brave or too lazy or both.

4. An analysis of the labour market

The main objective of this section is twofold: First, to show that the labour market is the most overregulated main market and second, to study how its equilibrium is reached as the output of the demand-supply game. The overregulation of this market means that the demand for labour is not in balance with the labour supply. In fact, the former is smaller than the latter, and as a consequence some number of people offering (supply) their ability to work are unemployed because the demand on the overregulated labour market is smaller than supply. The unemployment, particularly among university graduates, is a hot issue of public debates in many countries. As a by-product of our studies, we will show how the unemployment can be reduced here and now.

The labour market has passed the most revolutionary changes in comparison with the two remaining main markets. To see this note that in the slavery, slaves were traded on a typical market as any other commodity. For instance, in purchase of a slave or a horse, the tooth inspection was commonly employed, and such transaction was possible only between an owner of a slave or horse (supply) and a buyer (demand), who had the right to have slaves or horses. The slaves had no rights to participate at the market game, similarly as peasants in the feudalism. The capitalism has definitely lifted up all those restrictions and therefore, a worker, as an active player in the demand-supply game on the supply side of the labour market, is completely free in their (market) decision whether and where to work. The same can be said about the market decision of a capitalist as an active player on the demand side of that market.

To point out these revolutionary changes we focus our analysis on routine and **creative labour** instead of on a low-skilled and high-skilled worker, commonly used terms in one-dimensional economics (see e.g. [Mankiw, 2012, Chapter 7](#)). The difference between a high-skilled worker and the low-skilled one is, generally speaking, technical. Simply put, the first has more skills in routine work, than the second. A commonly used example of a routine labour is a work on the assembly line introduced by Henry Ford in motor industry a hundred years ago. It can be shown that the difference between creative and routine labour has a very here and now nature and creative labour is always connected with an attempt to solve creative problem, which by definition is unique here and now.

For simplicity, we assume that the labour market is a part of a national economy, and it is modelled as a black box pictured in Figure 4. Additionally, the national economy is

supposed to be closed – neither export nor import of labour in this case. It is worth comparing Figures 1 and 4. Because of these simplifying assumptions we model the labour market as a black box in Figure 4, but not as a full cycle shown in Figure 1.

The main aim of the labour market is to find (establish) the equilibrium between its two inputs – the **demand for labour** and the **labour supply**, treated as functions of time. Then, the **unemployment** is commonly accepted index of that equilibrium and at the same time the output of the labour market. In other words, the unemployment is the result of the **market game between the demand for labour and the labour supply** on that market.

Figure 4. An input-output model of the labour market

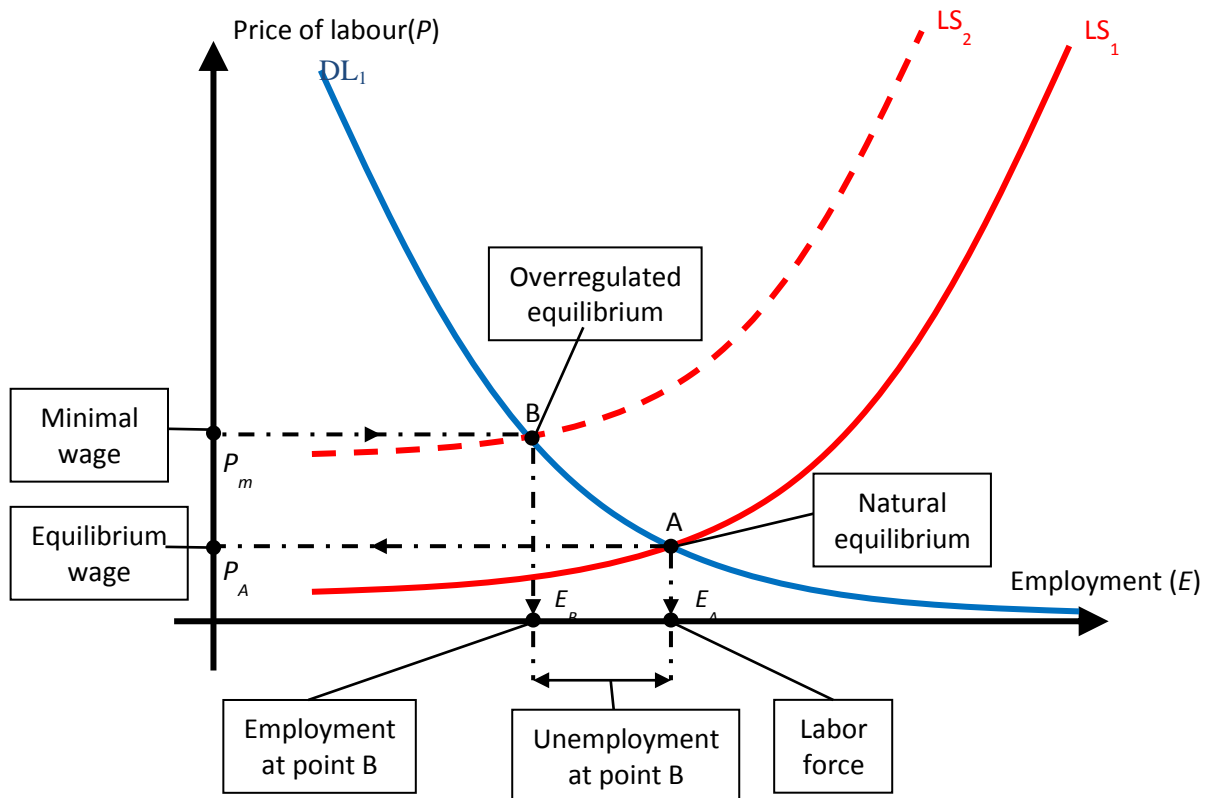


Two remarks are in order at this point. First, we, as all economist in one-dimensional economics, assume that all jobs are equivalent; so a more complex job is equivalent to some number of the simplest jobs. Therefore, we do not use the term ‘aggregate’ in definition of both demand and supply of labour. So, at this stage of our analysis the labour market resembles the money market, to be studied in the next section where single good – money – is traded. Second, we also suppose that there is no specialization among workers; simply they do accept job offers on the economic base only. Thus, we will explain the overregulation of the labour market using arguments of one-dimensional economics. Later on, we will critically look at these two assumptions.

Since each worker has their own **human capital** and a group of at least two collaborating workers creates **social capital** of that group, then these two capitals are traded in the labour market (Walukiewicz, 2015, Chapter 9). Therefore the labour market it is the most complex main market. Now, we will show that it is at the same time the most overregulated main market.

At the beginning we assume that there is no regulation on the labour market. Then the equilibrium on that market, as such on any other market, is defined as the intersection point of the **demand for labour curve** and the **supply of labour curve**, and it is called the **natural equilibrium (on the labour market)** – see point A in Figure 5. This point defines the **equilibrium price of labour** (P_A) and the **equilibrium employment** (E_A) that is the **labour force** of the considered economy. We note that there is no unemployment because the labour market is at its natural equilibrium, which means that demand for labour equals its supply or, in other words, each worker willing to work, finds a job.

Figure 5. The one-dimensional equilibrium on the labour market



Nowadays in many countries, for variety of reasons the **minimal wage** has been introduced, that is the **minimal price of labour** (P_m). For instance, it is the cost of one hour work at the simplest job, and it is usually above the equilibrium price. Therefore, the equilibrium in the labour market moves up to point B in Figure 5, which means that instead the natural labour supply curve (LS_1) we have the artificial labour supply curve (LS_2). Thus, the new equilibrium point B is not defined by the demand-supply game, but by the minimal price of labour (see a dashed arrow from point P_m to point B). The employment at the new equilibrium is smaller than that at the natural equilibrium, and the difference is called the **absolute unemployment**. It represents the number of jobless workers, who are unemployed because the minimal wage has been introduced on the labour market. A market with extra regulations such as the minimal wage is called an **overregulated market**.

It should be stressed that the overregulation of the labour market is not a mistake or someone's error, but to the opposite, there are strong arguments supporting it. Below we mention two of them in brief:

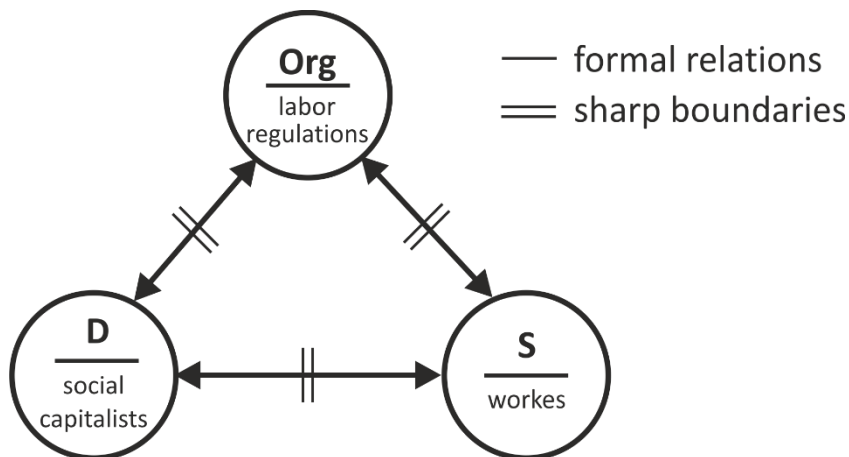
1. **A historical evidence.** Henry Ford (1863-1947) paying in 1914 workers of the Ford Motor Company the minimal wage of \$5 per day, two times more than his competitors, is probably the best known evidence that the minimal wage has an economic sense. We should remember that the motor industry was a very innovative sector of American economy at that time. In other words, by the minimal wage Ford promoted innovative economy and contributed a lot to the improvement of the division of labour and knowledge.

2. **The power monopoly of trade unions.** Nowadays in many countries, the wages of workers in almost all sectors of the economy are determined not by the equilibrium of demand and supply, but by a bargaining (process) between union leaders and firm management or entrepreneurs organizations. Often the government is an organizer of such bargaining process by setting up a special commission, and the final agreement raises the minimal wage above the natural equilibrium price, and allows firms how many workers to employ. Then, the non-zero unemployment follows directly from our analysis.

Thus, the overregulation of the labour market is a result of socio-economic development and it represents the current stage of the endless improvement of the division of labour and knowledge. So far, we have discussed the unemployment among workers (blue collars) doing simple (routine) job. It is self-evident that the demand for routine labour is shrinking nowadays because more and more routine jobs are done by robots, computer programs, etc. I think that the unemployment among blue collars will grow not only because of the minimal wage, as we have demonstrated, but first of all because of the **economic necessity**, the unavoidable process of socio-economic development.

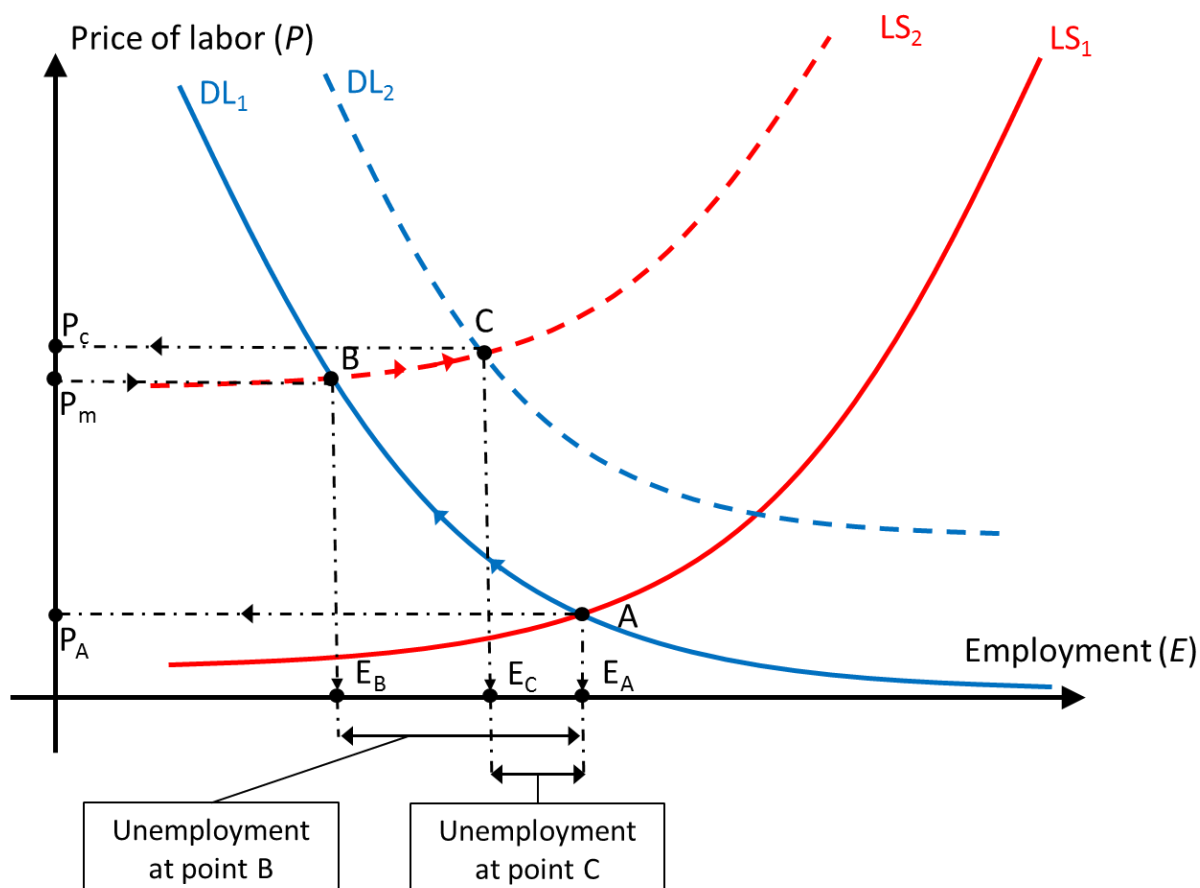
Since any market is formed by people, I introduce the concept of a **social capitalist**, who hires workers as demand in the labour market, and takes responsibility not only of the development of own human capital, but also responsibility of company's social capital. Then the **market triple of the labour market**, shown in Figure 6 looks like an equilateral triangle. For simplicity we assume that the demand-supply game is organized by the commission (organizer) described at point 2 above, which sets up all regulations in the labour market. The commission plays a role of an arbiter (referee) in the bargaining process, in fact the demand-supply game between social capitalists and the workers, and it should keep the equal distance to both demand and supply. Therefore, the market triple of the labour market is represented by equilateral triangle. All relations between the organizer, demand and supply are formal for obvious reasons. Social capitalists (demand) join their efforts in different organizations of entrepreneurs and workers (supply) typically unite in trade unions organized in different sectors of the economy.

Figure 6. **The market triple of the labour market**



As said, social capitalists investing on the labour market create an **additional demand for labour** what means that the demand curve moves up as shown in Figure 7 – curve DL_2 . The intersection of this curve with the artificial labour supply curve LS_2 gives a **new stable equilibrium** – point C on the labour market for which the unemployment is smaller than that caused by the minimal wage. Therefore, the social capitalists can reduce unemployment, in theory up to zero, and then the following question arises in a natural way: Where do social capitalists come from?

Figure 7. A role of social capitalists in the labor market



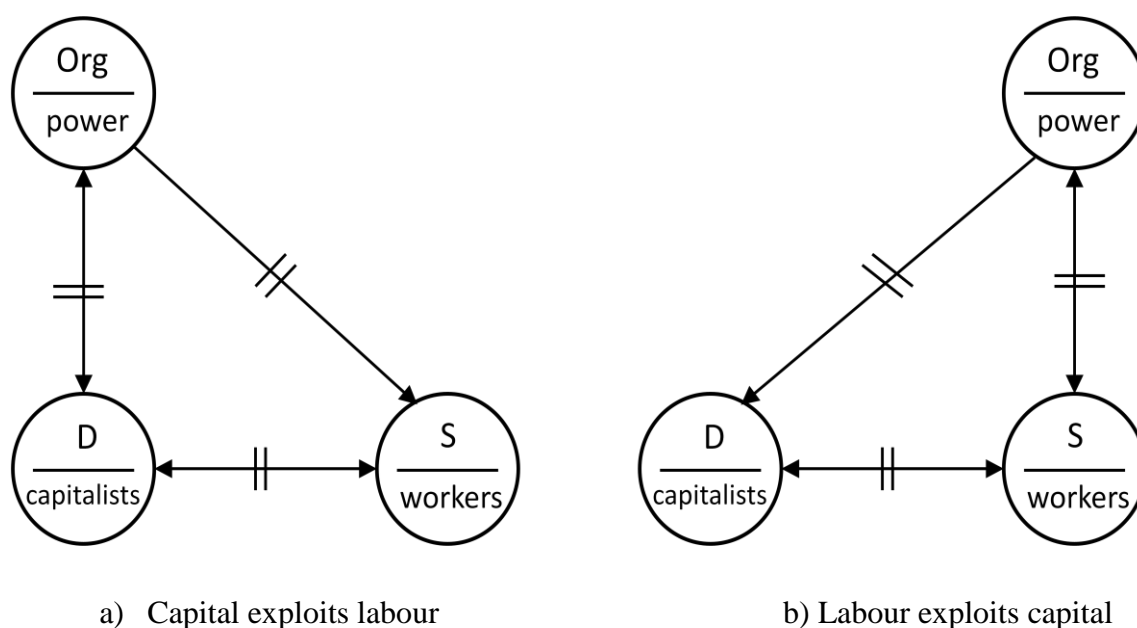
A very short answer to this question is: The social capitalists are from us; they constitute the most responsible part of our society here and now. In a market economy everyone as a **human capitalist** is responsible here and now for his or hers own **human capital** (professional knowledge, experiences, talent, health, etc.). We have demonstrated that a **social capitalist** hiring as demand workers (supply) in the labour market takes the **responsibility** of their **social capital**, the responsibility whether and how they will collaborate in the social capitalist's firm. Obviously, a social capitalist is at the same time a human capitalist, but not the opposite. Therefore, a social capitalist is responsible for both human capital and social capital, while unemployed, workers and sole proprietors are responsible for their own human capital, only.

In other words, a social capitalist hiring new workers, invest in them money either from the firm's saving or borrowed from a bank. In any case such an investment is connected

with a certain **risk** and the return on it, should be evaluated as a return on any other investment in a market economy. Definitely, the investment in creative labour (projects, teams, etc.) is challenging and risky, and nobody can in advance guarantee a success of such an approach, but I think nowadays such an investment is an almost unique source of economic sound return, an almost unique source of the wealth for a nation, family and man. Therefore, **social capitalists play an important role on the overregulated labour market**. Thus, our answer to the question is very well in accord the demand equals supply truth, saying that demand is leading, is more important, because if there is demand, then sooner or later there will be supply to balance it. Therefore, social capitalists deserve a special respect in a contemporary market economy.

The market triple of the labour market looks like an equilateral triangle for one more reason, to point out the equal **responsibility** of demand, supply and organizer in establishing the equilibrium on that market. Then, for instance, the government (power), as the organizer of the negotiations between trade unions representing the supply side and entrepreneurs representing the demand side, keeps equal distance from both these sides. Such a situation looks natural nowadays, but it was completely different in the mid of the 19th century when [Karl Marx](#) (1818-1883) wrote his famous *Das Kapital* where he repeatedly claimed that **capital (demand) exploits labour (supply)**. At that time capitalist as the owners of capital, both **financial capital** and **physical capital** in our terminology ([Walukiewicz, 2015, Chapter 9](#)), were much closer to the government (power) than workers. So the corresponding market triple is not an equilateral triangle but it looks like a right triangle with the right angle at the demand (see Figure 8a). Therefore, we call such a case in the history of labour market as **capital exploits labour**.

Figure 8. Two extreme market triples of the labour market



Definitely, the labour market exists from the very beginning of the humanity, and, through centuries, its market triple looked like a right triangle, because owners of the

production means, as Karl Marx called capitalists (demand), were always much closer to the power than workers (supply). In fact, such broadly understood capitalists constituted the (political) power, while attempts of slaves at the slavery and peasants at the feudalism to build a political power were, generally speaking, unsuccessful. At the capitalism, workers began to organize in trade unions to protect their interests in the labour market, and such trade unions step by step gained political importance in many countries. We can imagine the opposite, when workers (supply) are much closer to the power (government) than capitalists (demand). We call such a situation as **labour exploits capital** – see figure 8b. Probably the best known example of it is the British economy in the 1970s and 1980s, when trade unions had been changing the democratically elected governments. So, the shape of the market triple of the labour market has been changing over time, while the market triple of both the money market and goods market remain stable, as we will show in the next section.

5. Two remaining main markets

In this section we will study first the money market in a way similar to that we did in the previous section, and next goods market. To be more specific, we choose the American money market as an example for our analysis because it is a well developed market and American dollar plays a role of the world money.

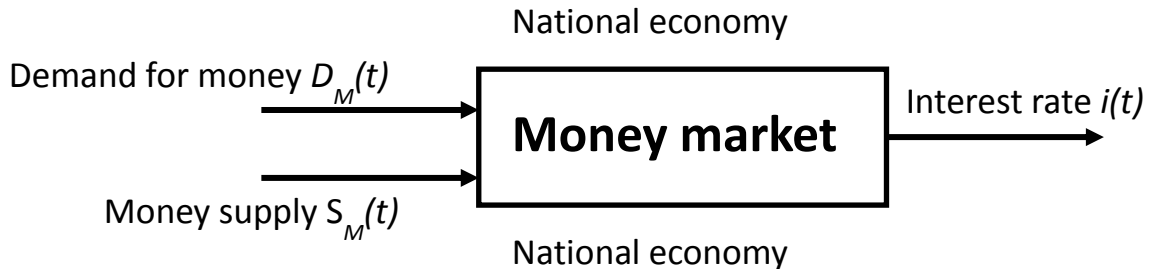
Nowadays, there are about 20 financial products (forms) of financial capital traded in the money market like money, presented in its different forms (currency, checks, credit cards, bitcoins, etc.), deposits, loans, bonds, securities, and their number cannot grow too fast because of the financial system stability. To simplify analysis we restrict our discussion to a single financial product – money, which can be kept either as currency in private vaults or as deposits on banking accounts. We will also consider only one way of saving or borrowing money from only one type of financial institutions – banks. These assumptions are necessary to present the idea how the money market works. Although the model studied in this section is a drastic simplification of a real money market or a real financial system, I claim that it still expresses the main idea of both and can serve as a basis for study of real money markets or modern financial systems in different countries.

The main result of these studies is a mathematical formula for the interest rate (see [Walukiewicz, 2015, Chapter 8](#) for details) to be set by the Federal Reserve (the Fed in short) for the American economy and indirectly for the whole world economy, since American dollar is the world money. To my best knowledge, the Fed so far does not compute the value of the interest rate using such a formula, but it takes decisions based on wisdom, experiences, economic analysis and predictions, not excluding so-called professional nose, etc. of the members of its board.

Similarly as in the previous section, we model the **money market** as a black box in Figure 9 with its two inputs: the **demand for money** and the **money supply**, respectively, and its output – the **interest rate**, all treated as functions of time. The main aim of the money market is to establish (define, find) the dynamic equilibrium in the game between the demand for money and the money supply expressed as the interest rate that is the output of our model. We know that the money market is a part of a national economy, represented in Figure 1 by three tightly linked main markets. To simplify our considerations we also assume for a

moment that the national economy is closed, which means that there are no foreign investors, nor foreign borrowers operating in the considered money market.

Figure 9. **Model of the money market**



To discuss the idea how the money market works we need, first of all, the definition of money. Defining money we face the same problems as we have with such general terms as ‘value’ or ‘market’ in Section 2. In a very short, I define **money** as a very unique good. A reader may object at this point since, generally speaking, everyone has or should have money in a market economy. Money is a very unique among all commodities because a typical good has a single main function (purpose), while money has three following purposes of equal importance:

- A. **Money is a store of value.** In Section 2 we have shown that in a market economy everything has its own **value** established or defined on an appropriate real or theoretically constructed market. The value is an output of the **market game between demand and supply** on that market, usually expressed in monetary units here and now or at the “present.” As a store of value, money is transferring the value or a **purchasing power** from the “present” to the “future.” In general, the value as the output of the demand-supply game at the “present” also depends on results of such a game in the “past.” So money as a store of value is a very unique good that links the value of any other good or service in the “past,” “present” and “future.” In other words, money is a convenient way to store (transfer) the value of any other good or service over time.
- B. **Money is a unit of account.** All balance sheets and financial reports are expressed in monetary units, because money provides convenient terms, in which prices of all other goods and services are quoted, and debts and savings are recorded. Then in a natural way the following question arises, what is the price of money? This question is very much in order with our claim that everything, including a very unique good – money – has its own value (price) established or defined on an appropriate market.
- C. **Money is a medium of exchange.** Again, money is a very unique good that facilitates exchange of any other goods and services. An economy without money – a **barter economy** – permits only very simple transactions and it has incomparable low **liquidity** in face of a **market economy** based on money. It is easy to show that money is the most liquid asset in a market economy. Simply put, if there existed a product more liquid than money, then it would substitute money as a medium of exchange.

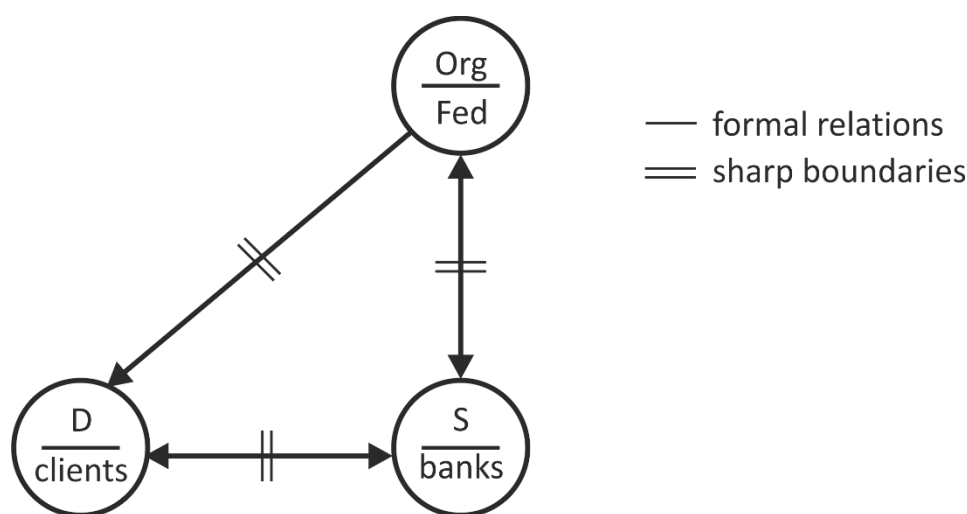
Money focuses the development of humanity and market economy in particular. All its history from the commodity money through the gold standard money to the recent fiat money – money established by government decree – once more demonstrates the role of social capital in modern economy (Walukiewicz, 2015). “IN GOD WE TRUST” is printed on each banknote of American dollars, and **trust** is the key component of social capital. In other words, people after centuries of experiences have come to the conclusion that we need money based on trust here and now. I consider this as one of the biggest achievements of humanity. Obviously, such trust is set upon firm conditions for control the originality of money in its different forms from time to time.

Although money is a very unique good, but it as any other commodity has its own price (value), which I define in the following way: A **price or value of money** is the **interest rate**.

Thus, the term ‘interest rate,’ in short ‘interest’ has the same meaning as ‘price’ or ‘value of money.’ It coincides very well with common opinion, since we usually say that ‘money is expensive’ when the interest rate is high and borrowing money from a bank costs a lot. In other words, the value of money is defined as a result of the **market game between the demand for money and the money supply in the money market**. So we can conclude that the price of money and the price, for example, apples are established by the same mechanism or by the market game between demand and supply on a relevant market. The key difference between apples and money is that apples as a typical commodity have one purpose, while money has three purposes of equal importance named as A, B, C above. It can be shown (Walukiewicz, 2015, Chapter 10) that the rules of the market game on the apples market and the money market are, in principle, the same.

As mentioned before, to be more specific we study the USA money market and its market triple, in particular, pictured in Figure 10. The Fed as the central bank of the United States is a natural **organizer** of that market, since it sets the general rules of the market game between the **demand** (clients people, institutions, firms, etc. – wishing to save or borrow money) and the **supply** (banks offering their saving or lending services).

Figure 10. The market triple of the USA money market



Clients wishing to save money (demand), deposit their money on saving accounts in banks (supply) at the “present” to withdraw them plus interest on the deposits in the “future.” Relations between demand and supply are formal (they sign some formal contracts, which specify the conditions of each deposit) and the boundaries between them are sharp because their roles in the demand-supply game are sharply different. We assume that the money market is in equilibrium, which means that the amount of new deposits approximately equals the amount of withdrawals. So banks always have money on their accounts called the **banking reserve**. Nowadays, banks work under the **fractional reserve banking system**, a system under which banks keep only a fraction, say 20 percent, of their deposits in reserve, offering the rest (80 percent) as loans. Banks are incentive to make loans because they earn money on such operations. Clients wishing to borrow money (demand), lend money from banks (supply) at the “present” to pay it back plus interest on the loans in the “future.” Again, the relations between demand and supply are formal (they sign the lending contracts) and the boundaries between them are sharp. Usually the interest on deposits is smaller than the interest rate for a given time, and the interest rate on the loans is higher than it. Banks earn money on the difference between the interest on loans and the interest on deposits.

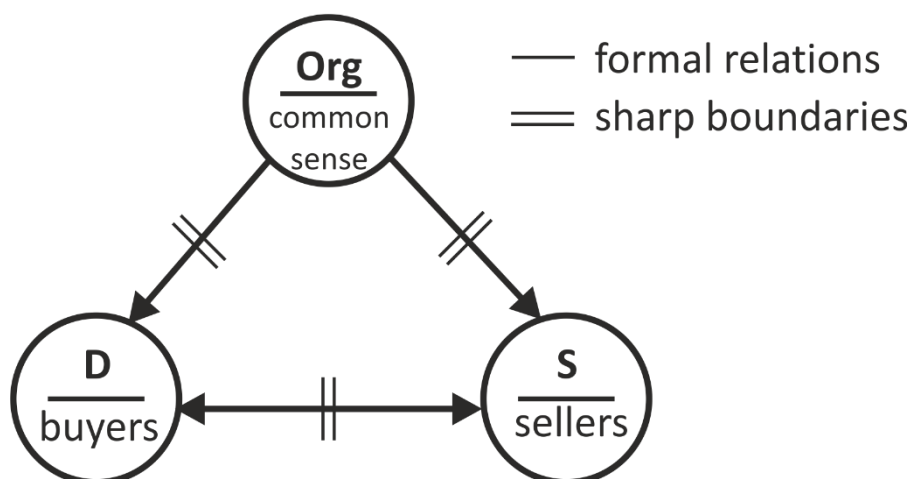
A **bank** is the **institution of public trust**, which simply means that a client depositing his or hers money in the bank at “present” trusts it that he or she will receive it back plus the interest on savings in the “future.” Nowadays banks cooperate very closely transferring, lending and saving money among them to make a market economy as liquid as possible because of the **economic necessity** here and now, coined in the three word sentence ‘**Time is money**’. So in fact, we have a very complex, multi level **banking or financial system** of a national and even global scale, which works 24 hours a day, 7 days a week and never rests or takes off for a vacation. We put all these banks, but the Fed, under the heading supply because they create and supply money to a market economy under the fractional reserve banking system. So the **market triple of the money market** looks as a right triangle with the right angle at supply S.

The money market is an **open market** since it creates a new money, which consumers use to buy consumer and investment goods in the **goods market**, to be discussed briefly below, and **social capitalists** to hire workers in the **labour market** (see the previous section). It can be shown (Walukiewicz, 2014) that the **research market** is also open, but its openness is of a completely different character: the research market creates new, unknown so far ideas, products, procedures, etc., while the money market simply multiply the well known product – money – under the fractional reserve banking system. We also note that the market triple of the money market is exactly the same as the market triple of the **NBA market** or the **political emotions market**, (Walukiewicz, 2014) but there is an essential difference between them: while the emotions markets are **closed**, the money market is **open**, since it creates (new) money under the fractional reserve banking system to be used in the other markets.

It is interesting to note that the market triple of the money market has not changed over time. All the time, the supply side defines the rules of the money market. In other words, in the money market, the responsibility of the supply side was and still is much higher than that of the demand side, and such a difference is stable over time. Nowadays, the Fed sets the rules of the demand-supply game in the money market and banks implement them within a (free) market economy under the fractional reserve banking system.

It can be shown that the **market triple of the goods market** looks like an equilateral triangle, shown in Figure 11 (Walukiewicz, 2015, Chapter 10), and it is stable over time, too. So, the labour market is the unique main market of which its market triple has been changing over time. This is one more example of revolutionary changes in the labour market.

Figure 11. **The market triple of the goods market**



At the end, it is interesting to compare Figure 11 (goods market) with 3 (green market) to point out the same origin of these two markets. As the volume of traded goods and services increases then the formal agreements between buyers (demand) and sellers (supply) appear in a natural way. Many economic textbooks study the whole market economy as the goods market. This is possible, although we following Keynes's idea distinguish the money market as the market for the most liquid good, and the labour market as the market for the most general service.

6. Conclusion

The growth theory (see e.g. Mankiw, 2012, part III) assumes directly that the two input variables of the market economy – **capital** and **labour** – are of the same importance. I think, it is not the case nowadays. Today, capital in its both forms **financial capital** and **physical capital** can be employed easily everywhere and always. We have demonstrated that the **labour market** is the **most overregulated main market** and such overregulation is the output of socio-economic development, the direct result of the **endless improvement of the division of labour and knowledge**. Therefore, I claim that labour is more important **production factor** than capital. In other words, people (labour) are unique and the most important actors in any economic activity, particularly in any creative activity, while capital serves as a production factor of a secondary importance.

When at least two **human capitalists** (individuals) collaborate then they create **social capital** – a new economic category very desired in families, firms and countries. Two machines (**physical capital**) cannot cooperate without at least one human capitalist (man) who connects them. Similarly, two funds (**financial capital**) will lay idle until at least one

human capitalist decides to use them jointly. I have shown that the value of social capital together with the value of human capital constitute the lion's share of the market value of the ICT corporations like Google, Microsoft and Nokia. (see Table 5.1 in Walukiewicz, 2015 for details).

One-dimensional economics considers only one type of labour – **routine labour**, which is divided further into **low-skilled labour** and **high-skilled labour** with the assumption that the last equals some multiple of the first. I have introduced a concept of **creative labour** as a **here and now** negation of routine labour, and have shown how this concept can be used both in theory and practice. The division of labour into routine and creative one is useful because while the demand for routine labour is shrinking, the demand for creative one is growing, and more and more it becomes a unique source of wealth for a man, family and nation. Since creative labour is, by its definition, unique, then its analysis, evaluation and organization require an entirely new methodology. The main aim of **two-dimensional economics**, presented in my book, is to provide such a methodology.

7. References

- Arrow, K.J., 1999. Observations on Social Capital. In: Dasgupta, P., Serageldin, I. (Eds.), *Social Capital. Multifaceted Perspective*, Washington DC., World Bank,
- Jacobs, M., Mazzucato, M., (Eds.), 2016. *Rethinking Capitalism. Economics and Policy for Sustainable and Inclusive Growth*, John Wiley & Sons Ltd.
- Keynes, J.M., 1936. *The General Theory of Employment, Interest and Money*. Cambridge, England: Macmillan Cambridge University Press.
- Mankiw, G.N., 2012. *Macroeconomics*, 8th Edition, Houndmills, England: Macmillan.
- Mazzucato, M., 2016, Innovation, the state and patient capital, in Jacobs, M., Mazzucato, M., 2016, 98-118.
- T. Piketty, 2014, *Capital in the 21st Century*, Cambridge, MA, Harvard University Press,
- Putnam, R.D., 2000. *Bowling Alone. The Collapse and Revival of American Community*, New York, Simon and Shuster.
- Robinson, L.J., Ritchie, B.K., 2010. *Relationship Economics. The Social Capital Paradigm and its Application to Business, Politics and Other Transactions*, England, Surrey, Gower Pub Co.
- Stiglitz, J. E., Sen, A. and Fitoussi, J. P., 2010 *Report by the Commission on the Measurement of Economic Performance and Social Progress*, Paris, Commission on the Measurement of Economic Performance and Social Progress, 2010.
- Stiglitz, J. E., 2016, Inequalities and economic growth, in Jacobs, M., Mazzucato, M., 2016, 134-155.
- Walukiewicz, S., 2014. The Market Triple, CEJOR, 22, 713-727, DOI: 10.1007/s10100-013-0299-2
- Walukiewicz, S., 2015. *Two-Dimensional Economics*. A manuscript, Systems Research Institute, Polish Academy of Science, Warsaw.