Local money = less deprivation?

a theoretical study into the social usefulness of local currencies

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26-04-2013, Wageningen University

Abstract

To combat unemployment and deprivation, many interventions aim to bring unemployed back on the formal labour market. Another way to improve welfare of the deprived is to improve the local informal market, for example by the creation of a local currency. In Rotterdam South such a local currency will be introduced in August 2013. Although there are many examples of community currencies, it is a rare concept in economic literature. Therefore this study explores what economic theories predict about the social usefulness of an organized local informal market with an own currency. Social welfare is improved by the use of overcapacity and by utility from social interactions, but unjustified unemployment benefit consumption and tax evasion may reduce social welfare. The conditions that need to be fulfilled in order to make the informal market socially useful are discussed in the first part. The second part of this study discusses which currency optimally contributes to the social usefulness of the informal sector. The design of the currency system for Rotterdam South should minimize transaction costs, but also allow for the possibility to tax activities and to reduce unemployment benefits. The main characteristics of the optimal currency for Rotterdam South are that the currency is created digitally, that time is its standard of value, and that it is inconvertible into the euro. Furthermore it is important that the initiators closely control stability of the currency.

Acknowledgements

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1. Introduction

1.1 Deprivation and labour allocation

Social and economic deprivation is a phenomenon that is discussed intensively in the scientific and political debates about social welfare. Research is focussed on an optimal measurement of deprivation (e.g. Nolan & Whelan, 2011) and subsequently on an approach to combat deprivation (for example in de Haan, 2000 and 2009). Measurements that are taken to combat deprivation vary from structural aid like housing subsidies and unemployment benefits to policies that focus much on increasing self-help. In the Netherlands, the 'participatie ladder' (participation scale) is used to describe the participation of someone in society (VNG, 2011, see figure 1.1). The argument behind this policy indicator is that deprivation is related to the degree of self-help. According to the participation scale, a very deprived person or household is totally dependent on the unemployment benefit (implying no self-help) and lives in social isolation. The highest scale is to have a paid job and to live independently from any form of social help.

Figure 1.1
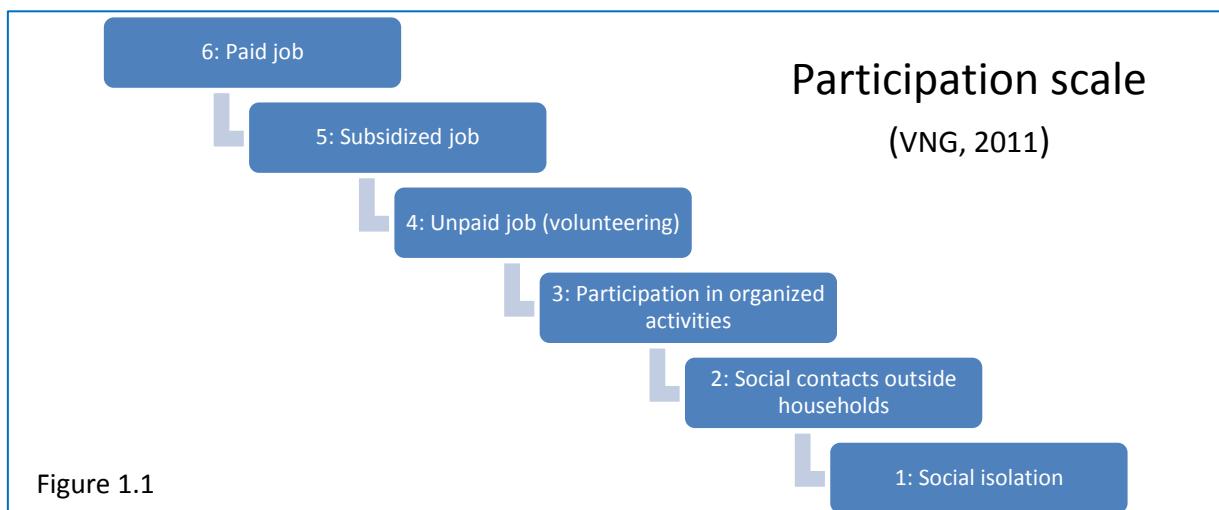
If someone becomes unemployed, he uses his time to consume leisure, to search for jobs, to do household production and to make gains by barter exchanges or/and exchanges on the informal economy. Once the economy recovers, he may have the ability to allocate his time in a formal job again. Some workers never get the possibility able to increase to step 6 on the participation scale because they are incapacitated. Other workers have the ability, but tend not to do so since they prefer the unemployed situation (welfare trap) and a third group of workers will become active in a formal job and reach step 6 of the participation scale.

In the *first best world*, becoming active in barter exchanges and the informal economy is not necessary since the 'invisible hand' will allocate labour efficiently among activities. However, in the *second best world* being active in barter and the informal sector are solutions to use over-capacity (in the short run). The extent to which an unemployed person is able to use its over-capacity of labour resources depends on its social and economic network. In an area where many people have a lack of social and economic ties, there is more over-capacity and less ability to use this over-capacity in barter or informal exchanges.

To prevent that labour is unused the government focusses on including as many workers as possible in the formal economy, for example by skills training, the obligation to apply for jobs and other

unemployment combatting policies. Another way to prevent labour to be unused is to organize market mechanisms useful in the *second best world*: the informal economy and barter exchanges.

1.2 Improve informal market efficiency

There are initiatives that bring informal demand and supply together, for example www.marktplaats.nl or brokers that connect people to voluntary work. A way to deal more specifically with locally clustered unemployment is to create local informal markets. Such informal markets and barter networks may already exist, but usually they are restricted to ethnicity groups or families. Information about local demand and supply in the informal economy is not available for every deprived household. The introduction of a local informal (virtual) market place with an own currency would in two steps contribute to gains from informal trade (Perlman, 1971):

- The development of a Hicks type market <u>provides information</u>. The role of a market is to be an information mediator; it increases the possibility that there is *double coincidence of wants*, since there is one (virtual) place where all households can meet. Theoretically, for each transaction combination, there is a 'stall' where the households can perform the transaction (for example cakes for clean windows and vice versa). If n is the number of different products/services offered there are $\frac{n*(n-1)}{2}$ stalls[1] on the (virtual) market. Households can 'visit' the right stall and trade to transform their household production set to a desired consumption set. Since this market is open to everyone of the region, households with a lack of social contacts are also able to get gains from barter.

- The development of a monetary commodity <u>facilitates transactions efficiently</u>. The introduction of money reduces further the necessity of *double coincidence of wants*, since you do not have to be interested in the products of one of the buyers of your product. Instead of $\frac{n*(n-1)}{2}$ stalls, there need to be (n-1) stalls if a monetary commodity is accepted in every stall (Nb. money is one of the commodities in n). The larger n, the more a monetary commodity contributes to the efficiency of the market. Further, the monetary commodity reduces the necessity of *double coincidence of timing of transactions.* If a specific household likes to consume more leisure in the summer, it can compensate it by working more in the winter without complicated administration costs and the risk of losing the right to consume during the summer. There will also be trade in identical services with a time difference. One person can offer its babysitting services on Tuesday and use its salary to spend on the same service on Wednesday. These extra possibilities that money offers are expected to improve efficient use of over-capacity even more.

So if an informal market mechanism with an own currency will be organized, the process of supplying over-capacity is expected to bear lower searching and transaction costs, making the unemployed able to increase their purchasing power (real income). How much the purchasing power is able to increase depends on conditions of the households in the region, but also on the way in which the monetary commodity is able to facilitate the transactions. This thesis investigates which conditions have to be fulfilled in order to make an organized informal economy socially useful. This introduction contains more basic information about local currencies and the case for which this thesis is written:

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[1] Perlman mentions that there are n*(n-1) stalls on the market, since he defines a stall as a place where a fixed good can be given away in exchange for another fixed good. E.g. there is a stall to buy cakes with clean windows and there is a stall to buy clean windows with cakes.

Rotterdam South. Subsequently the aim of this thesis, the framework of research questions and the methods used, are discussed.

1.3 Local currencies

1.3.1 Reasons in favor of a local currency

The main reason for using a local currency described in this thesis is the use of over-capacity and under-demand, but there are more reasons to introduce a local currency. In the interdisciplinary broad debate about community currencies, the reasons can be classified in three categories.

The first type of argument is efficiency. As discussed before, in the *second best world*, the formal economy is not able to use all resources optimally. Due to (short term) inefficiency unemployed people have skills and time, but only use them in household production, in barter and/or informal exchange, dependent on their networks. By changing the facilitation of transactions in such networks, more gains from trade can be made. The facilitation of transactions by one-to-one barter requires double coincidence of wants. The facilitation of exchanges in the traditional informal economy requires availability of the (inter) national currency. By a lack of regional income, this traditional informal trade may be constrained. A local currency solves for the double coincidence of wants requirement and offers a currency whose supply can be governed locally. *'Complementary currency systems help in a situation in which sections of the population are time-rich but money-poor'* (Pacione in Gomez & Helmsing, 2008).

The second type is used by groups that see localism as answer to global problems like pollution, exploitation and poverty (Eisenstein (2011), Curtis (2003)). In their view, community currencies are useful because the agreement that local money has value creates a community feeling and intensifies community interactions. Exploitation of nature and labour forces can hardly be neglected if production appears locally. They do not mind quantity losses from the absence of scale economies, since local production offers quality. According to them, utility increases by a higher quality of life, not by a larger bundle of goods. People using a local currency for this reason are usually wealthy, since they have the ability to sacrifice a part of their consumption set for a higher quality.

The third type of arguments is closely related to the localism viewpoint, but is oriented at the welfare of the own community. Because the monetary policy of the organization that gives out the local currency is practiced locally, the decisions can be made specifically to serve the locality (instead of a whole country). By coordinating the currency locally, it offers a counter-cyclical effect to developments of the national or international currency. If euros are scarce, workers/businesses might prefer being paid in local money to losing clients (Kalinowski, 2011, Stodder, 2000). Furthermore the infant-industry argument can be mentioned. Deprived unemployed get a better chance to increase human capital if they operate on a 'protected market'. By local exchanges in local money, unemployed are able to practice higher-skilled activities, without facing direct competition of specialized businesses. Although the other participating households have the possibility to 'import' those services from the formal sector, they may still choose for the relatively more expensive informal product if the local currency is not officially convertible into the euro. In this way the unemployed do not necessarily have to be active in low-skilled informal work.

1.3.2 Historical background of local currencies

With the development of national and international trade networks, the monetary systems that were used to ease transactions underwent a homogenization process. In 1871 almost all currencies were backed by gold, in order to ease the transactions. From 1932 on, with as significant moments the

conference in Bretton Woods (1944) and the abandonment of fixed exchange rates (1973), the global financial system grew to its current shape. The place of a national currency within the global system of currencies has become very important for a country's welfare. Besides money that is regulated nationally (by the Central Bank) in the interest of national economic stability, local governments, corporations and local communities created complementary currencies.

Early examples of alternative forms of money are Free Banking corporations that existed in the 18th and 19th century in USA, Sweden, Scotland, Australia and Switzerland. Hayek (1976) formalizes the argument for the denationalization of money. His main argument is that the government uses its money monopoly wrongly. He supposes that private banks should compete in developing strong and valuable currencies. Then the market decides which currencies to use: the most effective one. On international scale this already exists in the continuous competition of national currency stability (if the dollar depreciates, investors will shift to other currencies) but the coordination is still in the hands of public institutions.

Other examples of additional forms of money are created by the local government or corporations during extreme economic circumstances. During the depression in America (1930) there was an enormous shortage in income. Because there were people willing to work and needs to be met, local informal currencies replaced the role of the dollar. The value of the currency was expressed in commodities like coal or the local government accepted them as tax payments (Gatch, 2008). Other famous examples in this category are the Credito and the Red Global de Trueque that facilitated almost all regional transactions during the Latin American crisis in the 1980s. (Ould-Ahmed, 2010; Pearson, 2003)

A third group of examples exponentially increased over the last two decades (Lietaer, 2001). Those are usually small, private or community currencies raised by people that have concerns about the globalization process. In some cases motivated by efficiency, but in most cases by localism, their aim is to localize production and consumption as much as possible. They see it as an answer to the actual limits that are reached in production on earth and a way to get the potential out of their community. In Europe, there are 103 registered community currencies (CCs) with a yearly estimated volume of 5,537,392 USD and a yearly operation budget of 3,356,204 USD (CC database, 2012). They have different characteristics with respect to the dimensions (1) type of money, (2) standard of value, (3) store of value, and (4) convertibility into (inter) national money.

1.4 Case Rotterdam South

Two local groups in Rotterdam South started to think about introducing a local currency in their neighbourhood. One of them already has a business plan and is planning to start the project in August 2013. Why is there want for a complementary currency in Rotterdam South?

In Rotterdam the differences between rich and poor households are larger than the Dutch average. Although the port and the centrality of the city attracts and generates many rich people, 14.1% of the households in Rotterdam live below the low-income level (CBS, 2010), compared to the Dutch average of 7.6%. Of these households, 23.4% is receiving an unemployment benefit, which means that the labour force of the household is long-term unemployed or does hardly have an employment history. Those people are time rich, but money poor. The poverty is especially present among immigrants. Of all immigrants from non-western countries, 25.9% live below the low-income threshold. (CBS, 2010 data)

The poverty is clustered in the so-called bad neighbourhoods. Elsevier (a Dutch opinion magazine) published a test of 6500 districts, and the quarters Hillesluis, Tarwewijk and Feijenoord in Rotterdam South appeared to be the three worst neighbourhoods in the Netherlands (figure 1.2). There is much unemployment, criminality, and there are few nature and leisure possibilities (Louter & van Eikeren, 2012).

Figure 1.2: attractiveness of living districts in the Netherlands, blue is low attractiveness (bureau Louter, 2012)

So by a lack of jobs, several forms of deprivation, social needs, but also the presence of potential, the introduction of a community currency is very welcome. Concerning efficiency, but also with respect to community building, the introduction of a new currency is expected to be socially useful. The initiators plan to introduce the currency in August 2013. They already made some decisions about the design. The legal entity of the initiating organization is a private company named BV De Zuiderling. Two years after the introduction of the currency the company will give away its shares to Inhabitants Trust Rotterdam South, a group of representatives of Rotterdam South. All profits will be used for resident initiatives that contribute to community building. The project will be restricted to Rotterdam South (figure 1.3). The target group is all inhabitants, with a specific focus on unemployed that definitely have over-capacity and unmet needs. Working people, small local businesses and charity organizations are also allowed to participate. The project will implement an inconvertible currency, Zuiderling, connected to the value of time. New members pay €4.50 to get an account in Zuiderling with a specific start-budget. A website, advertisements boards and brokers (with a wage in Zuiderling) will connect demand and supply. One Zuiderling equals the value of 30 minutes, but if a

Figure 1.3: Rotterdam South

service/good becomes more valuable relatively to other services/goods it is possible to arrange a payment higher than the hours worked. Most transactions will be administrated and regulated digitally via a text (mobile phone) or a visit to the office. There will also be sales of banknotes, but those are more for community purposes (carry concrete value) and they can be sold to tourists. (Manders & Kromwijk, 2013) Since many decisions were made during the period in which this study is conducted, it was not possible to take into account all the developments. In order to have some connections to the plan, blue textboxes describe the decisions that the initiators made concerning the topic of the chapter.

1.5 Scope and objectives

The aim of this study is not to work out the extensive plans that the initiators of the Zuiderling already made. The scope is more general: to approach the concept community currencies from a theoretical economic point of view, more specifically to discover which role a locally organized informal market with a local currency can play in poverty alleviation.

Preferably this should be studied using both (1) theory and (2) (quantitative) empirical analyses on production, money supply, price stability, welfare improvement and other relevant variables. Unfortunately the second method cannot be used, since quantitative data about community currencies is hardly available. Research into local currencies is often practiced qualitatively, based on historical records or qualitative interviews, except for some surveys about member convenience (for example in Williams et al., 2001). Information of the performance of the local currency in Rotterdam South is also not available, since the project still has to be started. One option to do empirical research on this topic is to start small scale pilots or to interview people in the target group of the project. However, the initiators in Rotterdam South itself already do the practical research. Since they have the contacts, living place and resources to do so, I decided to focus on the theory only.

In order to connect to the project in Rotterdam South, several blue textboxes describe the findings and choices of the initiators during the period I wrote this thesis. Unfortunately my recommendations are quite general and most of them are already taken into account, so the usefulness of this report may be limited. However, it is also good to see that the advices from theory generally confirm the choices that are made by the initiators.

Consequently the scope of this study is limited to what economic theory, monetary theory and local currency literature say about the role that an organized informal market with a local currency may have in poverty alleviation. The objective of this study is *to describe under which conditions and how the introduction of a local currency is socially useful in helping the deprived households of Rotterdam South.* The two sub-objectives are:

(1) To get insight in conditions that need to be fulfilled in order to make the introduction of an organized informal market socially useful. (real part)
(2) To discover how and in which form a local currency optimally contributes to the facilitation of these conditions. (monetary part)

This will be done by reviewing economic and monetary theory and findings in studies of already existing local currency networks.

1.6 Research questions and operationalization

1.6.1 Framework of research questions[2]
Under which *conditions* and in which *monetary form* is the *organized informal market* a *socially useful* intervention?

Real part:
Under which conditions is the introduction of an organized informal market a socially useful intervention?

- Under which conditions is an organized informal market *viable*?
- What are the effects of the organized informal market on labour participation and how can the negative effects on the *formal market* be minimized?
- What are the effects of the organized informal market on the formal market for goods and services and how can the negative effects on the formal market be minimized?

Monetary part:

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[2] The words in italic will be operationalized below

How and in *which form* can a *local currency system* contribute to the *facilitation* of the conditions found in the real part?

- How can money contribute to the facilitation of the conditions found in the real part?
- What are the *optimal choices* in designing a local currency system?
- Which *instruments* do the *initiators* have to guarantee a stable value of the currency?

1.6.2 Operationalization

Conditions: Requirements with respect to (1) properties of the design of the informal economy (those have to be defined by the project) (2) properties of the households in Rotterdam South.

Monetary form: Characteristics of the currency system. A currency system includes the all general issues in the creation, administration and management of the currency. On all these topics the initiators have to make a choice.

Organized informal market: The informal market is a part of the economy not taxed and not monitored by the government. This market already exists, since pilots show that there are unregistered employed persons (European Commission, 2007). The <u>organized</u> informal market is a project that stimulates the availability of information in these informal markets, so more unemployed people may be involved and more efficient transactions can be arranged. One aspect of this organized informal market is its own currency, which will be discussed in the second part. Synonyms for 'organized informal market' used in this thesis are *informal market, informal sector, informal economy.* (The word 'organized' is often not mentioned)

Socially useful: An intervention is socially useful if social welfare is increased. The efficiency goal is Pareto efficiency: no individuals can be made better off without making someone else worse off. In changing characteristics of the society, there are almost always winners and losers, so it should be feasible that winners compensate losers or that the negative effects are so small that they can be neglected. In the context of the informal market, socially useful means that gains are made by the prevention of labor over-capacity and by the creation of utility from social interactions, but these gains are not outweighed by the social costs of unjustified unemployment benefit consumption and tax evasion.

Viable: The organized informal economy is viable if two conditions are fulfilled: (1) there are at least two deprived households that make use of the organized informal economy (they make a transaction using the facilities implemented by the initiators) and (2) the initiators are compensated for their effort.

Formal market: All economic activities that are registered, taxed and regulated by the national and/or international government.

Local currency system: A local currency is especially issued to be used for the facilitation of transactions within a specific locality or between people/businesses sharing the same values. Synonyms are community currency, complementary currency, additional currency (in some sections the abbreviation CC is used). The system includes the all general issues in the creation, administration and management of the currency.

Facilitation: Activities that assist in fulfilling the conditions described in the *real* part.

Optimal choices: Choices can be made with respect to currency type, standard of value, store of value, convertibility and the use of instruments to generate income and work on the credibility of the currency. Choices in these terrains should be made with as directive that the conditions from the first part are optimally fulfilled.

Instruments: All mechanisms that the initiators of the CC may use to control money supply and the real value of money.

Initiators: The group of people/organization that organizes the informal sector and gives out the community currency. In the case of Rotterdam South, this is BV De Zuiderling.

1.7 Methods

The methods used to answer the research questions are (1) literature review about theory and practical examples and (2) application of general economic and monetary theory on the topic. Economic literature about local currencies is hardly available, so in order to give proper economic answers very general theories varying from the theory of comparative advantage to transaction-costs theory, are used (Box 1). Those theories are applied to the case of the local informal economy and supported by findings in non-economic literature about local currencies. This research is exploratory, since it explores the conditions and forms under which an organized local market can be socially useful.

By using basic economic theories, I hope to give clarity about misunderstandings that exist in the local-currency-debate. Examples of these are that people suffer by a lack of money (it is a lack of *income*, since money is neutral) and that trade openness of a region causes exploitation of all poor workers. These misunderstandings may be a reason for economists not to do research in this field. I hope this study gives a clear and proper economic insight in the possibilities of an organized local economy with an own currency, allowing other (future) economists to agree with the findings and to see the many research opportunities that lie in this method to reach local efficiency and to alleviate poverty.

First part: *comparative advantage, opportunity costs, value from social interactions, economies of scale, transaction costs, welfare trap, participation, signalling, human resources, labour supply, preferences, tradability, substitute, complement,*

Second part: *quantity theory of money, medium of exchange, store of value, standard of value, optimal currency area, convertibility, price instability, monetary and fiscal policy*

Box 1: theoretical concepts used

Real part

Under which conditions is the introduction of an organized informal market a socially useful intervention?

2. Viability of the organized informal market

2.1 Introduction

The main question of this chapter is 'Under which conditions is an organized informal market *viable*?'. The answer will be structured in conditions necessary for a viable market. What is a market? Although it is used a lot, the word 'market' is not defined often in economic literature. In micro economic textbooks the meaning of 'market' is '*a system that mediates transactions between agents*' but one can only read it between the lines (For example in Jehle & Reny, 2011:20). A market-situation requires a minimum of 2 actors, property rights and transferability of services and/or goods.

The role of a market described in this chapter is *facilitating efficient transactions* i.e. transactions that increase utility from the consumption set. As defined in the introduction, the organized informal economy is viable if two conditions are fulfilled:

(1) *There should be participants:* There should be at least two deprived households that make use of the organized informal economy (they make a transaction using the facilities implemented by the initiators). So there should be at least two households for which the informal market is able to increase utility from the consumption set. This is the case if (1) there is overlap in the type of products consumed and produced among households, (2) that households are productive in household production of tradable goods/services and (3) that they get gains from trade. There are several ways to get gains from trade: differences in productivity, differences in opportunity costs through time, a positive evaluation of interactions with other households and economies of scale that may appear once there is specialization. Those are discussed in the first section of this chapter.

(2) *There should be a way to cover the operation costs*

This chapter describes these aspects and forms theoretical conditions for a viable organized informal economy. The first section describes conditions for having participants and the seconds section deals with the operation costs.

2.2 Conditions for having participants

2.2.1 Similarity of products consumed and produced

It is important that the consumption of goods/services supplied by a household contributes to the utility of the demanding households, i.e. that there will be voluntary expenses on the goods/services supplied. There are two closely related examples where this is not the case: (1) It may appear that a household has comparative advantage in making paintings, but its paintings do not contribute to the utility of any other household, so there is no demand for paintings. Despite its comparative advantage, the household will not participate on the informal market. (2) This may also occur the other way around: a household could have supplied haircuts, but the other goods/services attainable on the informal market do not contribute to its utility, so the optimal decision is not to supply haircuts.

For the household of the first case, flexibility to switch to the production of other goods and services is a mechanism that provides gains from trade for the poor households, but more wealthy households may decide to exit the informal sector by a lack of buyers. In Local Exchange Trading Systems, with many rich retired members, some households are not able to gain from trade since there are no demanders for their product and they are not willing to supply something else (Williams

et al., 2001). It is not necessary that each household likes all goods and services supplied. By the intervention of money it is also not necessary that a household likes the products supplied by its buyers, but it will only be willing to earn money in the organized informal sector if its revenue is spendable on goods that contribute to its utility.

> Condition 1: There should be overlap among households in the type goods and services produced and consumed

2.2.2 Not too much preferences for leisure

There is a trade-off between consumption and leisure, since time is necessary both to work and to consume leisure. A household with very high preferences for consuming leisure may decide not to become active in the informal sector, since it is hardly active in household production. These leisure preferences will further be discussed in chapter 3.

> Condition 2: The household should do something in household production of tradable goods/services (instead of using time for non-tradable production and leisure only)

2.2.3 There should be net gains from trade

This section discusses the ingredients of gains from trade for participating households. Each ingredient discussed results in a finding about an effect on the gains from trade.

2.2.3.1 Differences in productivity: Ricardian model

Introduction

The well-known comparative advantage theory of Ricardo (1817) describes how differences in relative productivity result in gains from trade for two different countries. This model will be used here to illustrate comparative advantage of households in different household activities. The principle of comparative advantage is applied on several other levels, for example on firm level (Hunt & Morgan, 1995) and on household level (Becker, 1985). In this case the basic model with trade between two countries gives a proper insight in some necessary conditions to get gains from trade. In this example, households are the units of observation. The size, preferences and working time are assumed to be equal for all households.

Households (hhs) may already be active in the informal sector (not organized), but this trade is dependent on networks and coincidence. An Antillean family may consist of 10 households and they may share goods and services together, but not every household in the deprived area has the same access to such networks. Neglecting the informal trade relations that already exist would predict the organized informal sector to offer too many gains from trade. The reference point of gains from trade should be the starting situation: the informal trade relations that already exist by coincidence or by social networks. Those gains will be taken into account in the production possibilities of the household. Thus, a household with comparative advantage in the production of cakes may have the advantage from the productivity of its own members or from a unique contract with another household.[3]

Before the informal market exists, the utility of a household depends on utility from goods/services paid by the unemployment benefit (X_e), leisure (L), and household production (X_h). For simplification the number of producible goods is set at two. Household production consists of cakes and clean

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[3] For simplification, we do not consider the possibility that once there are gains from trade, those skilled households will stop producing for other Antillean households, since their gains from trade are larger on the informal market.

windows[4]. Each household has T hours in one period. This T cannot be used to supply labour in the formal economy, since all household members are unemployed. T can be used for different kinds of household production and for additional leisure (besides the minimum sleeping time). For now we assume that all available time is used for household production, so L is fixed at 0. Expenditures in the formal sector, X_e, are also fixed. Table 2.1 displays the costs and opportunity costs of household production. a_{YX} is the number of hours it takes household X to produce Y.

Table 2.1	Household A	Household B
Hours for 1 cake	a_{CA}	a_{CB}
Hours for 1 clean window	a_{WA}	a_{WB}
Opp costs one cake	a_{CA}/a_{WA}	a_{CB}/a_{WB}
Opp costs one clean window	a_{WA}/a_{CA}	a_{WB}/a_{CB}
Time constraint	$a_{CA}X_{CA}+ a_{WA}X_{WA}=T_A$	$a_{CB}X_{CB}+ a_{WB}X_{WB}=T_B$

Situation without transaction

Hh A's production possibilities are at a point between T/a_{CA} cakes and T/a_{WA} clean windows. Hh B's production possibilities are at a point between T/a_{CB} cakes and T/a_{WB} clean windows. The relative supply of cake is determined by the opportunity costs. For hh A, producing one cake costs a_{CA}/a_{WA} clean windows. For hh B, producing one cake costs a_{CB}/a_{WB} clean windows. The production choice that the households make could be given by the Cobb Douglas (Cobb & Douglas, 1928) utility (which is equal for both households).

$$U_i(X_c, X_w) := X_{c,i}^{\alpha} X_{w,i}^{1-\alpha} \text{ with } i = A, B \text{ and } X_{c,i} = \text{ consumption and production of cakes by hh i.}$$

This is the utility that households get from the consumption of cakes and clean windows. The consumption of other goods/services and the consumption of leisure is not taken into account in this equation. In the optimum, the marginal utility of cake divided by the price of cake is equal to the marginal utility of clean windows divided by the price of clean windows. The relative demand for cakes is given by the following demand equation:

$$\frac{MU_c}{MU_w} = \frac{P_c}{P_w} \rightarrow \frac{\alpha X_{c,i}^{a-1} X_{w,i}^{1-\alpha}}{(1-\alpha) X_{c,i}^{a} X_{w,i}^{-\alpha}} = \frac{P_c}{P_w} \rightarrow \frac{X_{c,i}}{X_{w,i}} = \frac{\alpha}{1-\alpha} / \frac{P_c}{P_w}$$

The equilibrium relative consumption and production of cakes is $\frac{\alpha}{1-\alpha} / \frac{Pc}{Pw} = \frac{\alpha}{1-\alpha} / \frac{a_{cA}}{a_{wA}}$ for household A and $\frac{\alpha}{1-\alpha} / \frac{Pc}{Pw} = \frac{\alpha}{1-\alpha} / \frac{a_{cB}}{a_{wB}}$. This is confirmed by Figure 2.1 in which the production possibility frontier (PPF) is combined with the highest attainable utility. For hh A it is the utility corresponding to the red curve and for hh B it is the utility corresponding to the purple curve.

Figure 2.1: PPF person A (blue) and person B (green)

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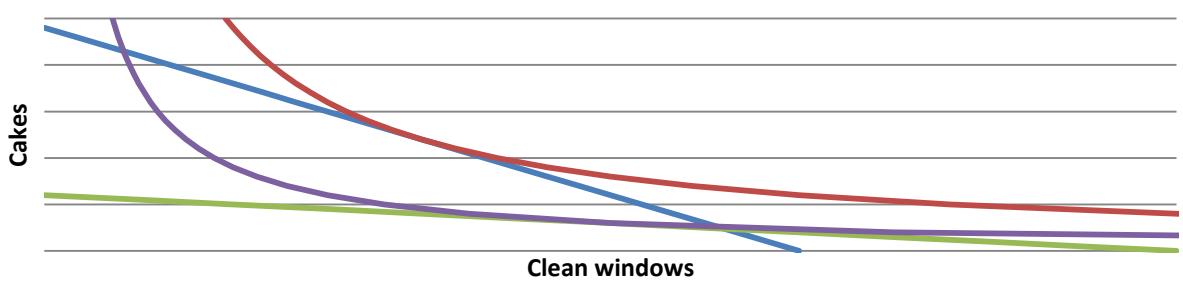
[4] The input costs (cleaning material, ingredients of the cake) are paid by the consuming households.

Allowing for transactions

We now introduce the informal economy. The informal economy creates the possibility for a transaction between all deprived members in the neighborhood. In this case the neighborhood consists of households A and B. A total relative supply curve can be created for both goods. The assumption is made that household A has comparative advantage in producing cakes, $a_{CA}/a_{WA} < a_{CB}/a_{WB}$. The aggregate relative supply curve for cake is displayed in Figure 2.2. The supply starts if the relative price is equal to the opportunity costs for cake for hh A. Then, hh B specializes in cleaning windows and hh A diversifies. On a relative supply of $\frac{C}{W} = \frac{T_A/a_{cA}}{T_B/a_{wB}}$ hh A specializes in cakes and hh B in cleaning windows. From a relative price of a_{cB}/a_{wB}, hh A specializes in cakes and hh B diversifies. Figure 2.2 depicts the relative supply and the relative equilibrium price.

In this case both households specialize completely and both households will gain from trade. Now, how much will each household consume? That depends on the wage of a household. Suppose the relative price of cake is p. The value of a clean window is then 1/p cakes. The hourly wage in hh A is then $1/a_{cA}$ expressed in cakes and $1/a_{cA} * \frac{P_c}{P_w}$ expressed in clean windows.

Figure 2.2: Relative demand and supply of cake
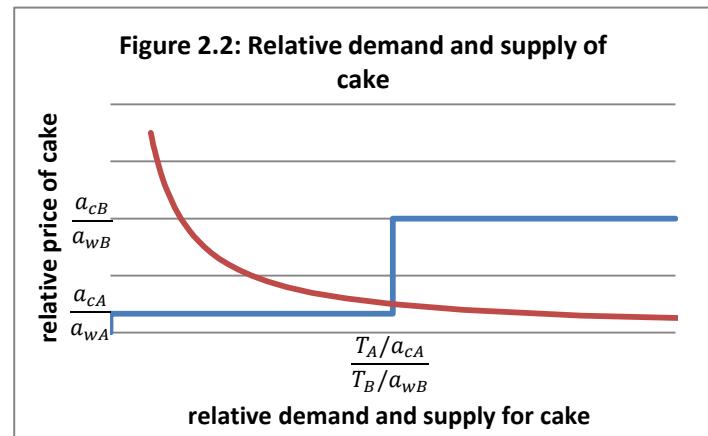
Before the transaction hh A needed a_{wA} hours to clean the windows. Now it needs less, since $1/a_{cA} * \frac{P_c}{P_w} > 1/a_{wA}$. Hh B also gained from trade. For a cake it does not need to work a_{cB} hours, but less.

It may occur that the relative demand curve crosses one of the horizontal parts of the relative supply curve. This happens in case of incomplete specialization, if $\frac{P_c}{P_w} \leq \frac{a_{cA}}{a_{wA}}$ or if $\frac{P_c}{P_w} \geq \frac{a_{cB}}{a_{wB}}$. Then one household gains from trade and the other is indifferent. The smaller the productivity differences between households, the more chance that there will be incomplete specialization. For a large household with many different skills among the members, it is more probable that relative prices equal the relative costs within the household. For a single old woman it is probably easier to make gains from trade, since her skills are more focused to more specific goods/services. Except if almost all participants are single old women or if preferences are little focused towards the product she offers. Although incomplete specialization may be a reason for some households not to participate, it is not plausible that the whole viability of the organized informal sector is at risk. Except if all households are equal in relative productivity or if there is no overlap in the type of products that households produce and consume. The relative productivity topic is discussed below and the overlap of consumption and production is discussed in section 2.3.1.

After trade, the consumption possibility frontier (CPF) is wider than the PPF (see Figure 2.3). In the figure both households have the same relative wage and the same labor hours available, so it is visible that their CPF is equal under transaction. Hh A's CPF switched from blue to purple, hh B's CPF switched from orange to the purple one. The high blue CPF is the CPF of the whole neighborhood. The total utility attainable is much higher now. The indifference curve related to that utility level is also depicted in figure 2.3. Because the CPF's are equal for hh A and hh B the utility is equally divided.

Both households gained from trade. Because the utility of both hh A and hh B increases in the informal economy, they will become active in the informal economy. If both households would have the same opportunity costs (i.e. if $a_{CA}/a_{WA}=a_{CB}/a_{WB}$) without the transaction, the total PPF would be without angle and both utilities would be equal, since the relative prices with and without transaction would be equal. Therefore, the presence of differences in relative productivity is an important requirement for the subsistence of the informal sector. Note that specific products or services for which unique skills are required have very high opportunity costs for households without those skills. Households having those skills will have, comparatively, very high wages in the informal sector.

Finding 1: gains from trade can be made if there are differences in relative productivity

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Figure 2.3: PPF of neighbourhood
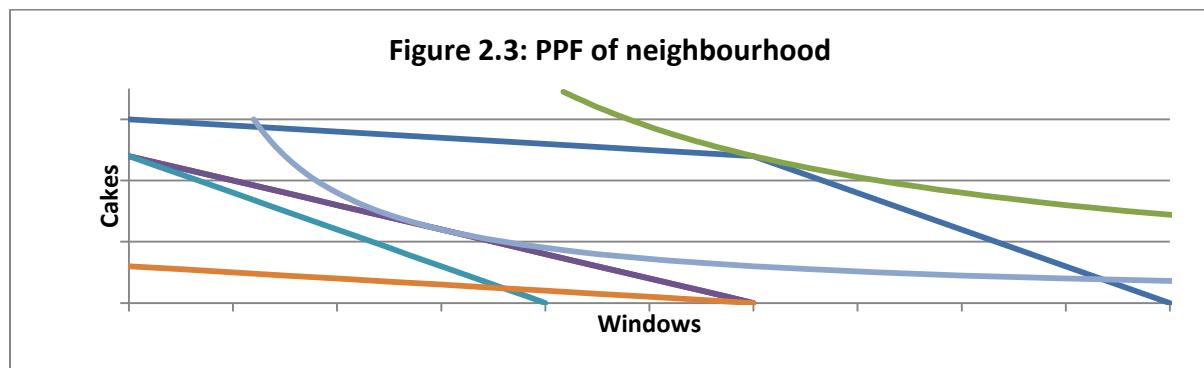
2.2.3.2 Differences in opportunity costs through time

In the Ricardian model, production and consumption choices were made based on the opportunity costs: if you produce a cake, this time cannot be used to clean a window. A more general definition of opportunity costs is the sacrifice of the second best choice by choosing the first best offer. In the Ricardian model, the production of another good was the only option, but in real life there are much more options. Considering the dimension time, there may be differences in opportunity costs even in absence of relative productivity differences. The opportunity costs for babysitting during a nice party are higher than during an empty evening. If those opportunity costs vary per evening by household, gains from trade can be made. Which types of goods/services can be traded notwithstanding an equal relative productivity?

Goods

Of goods, especially perishable goods can be traded in this way. Suppose there are two identical households (in productivity) that each has an identical apple tree. They spend an equal amount of time on harvesting the apples, so their garden and their labour have the same productivity. If there is sufficient time between the harvests of both households, they are better off if they trade. The opportunity costs of having one time many apples are high, since the second choice is to have several times fresh apples by trade.

Services

There are many types of services in which the hourly productivity of different households is close to equal, especially household production like cooking and babysitting. Differences in opportunity costs exist because opportunities differ through time. This may be related to the (social) networks a household is member of, or its activity-habits that may vary per week/season. A household involved in celebrating Carnaval values babysitting during Carnaval more than after or before Carnaval. An

informal worker with irregular working hours prefers someone else to cook for him if he has to work until 19:00 over a day he has to work until 14:00[5].

Considering this time dimension, it is important that there is a proper monetary unit to guarantee the store of value function of money. This will be taken into account in the second part of this thesis.

> Finding 2: gains from trade can be made if there are differences in opportunity costs over time

2.2.3.3 Social evaluation of interactions with other households

One of the assumptions of the Ricardian model is that countries are indifferent between a home produced or a foreign produced good; $X_A \sim X_B$. For the informal sector, this is not a realistic assumption since the consumption of a good produced in another household requires at least one transaction. The description of transactions and their related costs and revenues are split up in two sections. This section deals with the *social* effects and section 2.2.4 deals with the *material* effects, e.g. uncertainty about the quality or transport costs. For this section it is assumed that social interactions affect utility, so a household is not indifferent between X_A and X_B since there is a byproduct in the good produced by the other household.

That social interactions have (positive or negative) value and affect utility is also mentioned by founders of microeconomics, like Marshall, Bentham, Pigou and others (mentioned in Becker, 1973). However, it was often treated as an exogenous variable. Becker (1973) inserts the economic value of interactions and the social environment endogenously in a model of consumer demand. He shows that, if the option to spend/invest in social interactions is incorporated, more insight in interactions can be gained. Besides an effect on income (change in budget set), choices in social interaction also affect social income (esteem and support of others), so it may be useful to invest in your social environment. For the initiators of the Zuiderling the social gains are the main reasons to organize the informal market. According to them, it will provide an increase in aggregate happiness. This is the second aspect of the concept 'socially useful' as defined in the introduction.

The social interactions that are a result from organized informal sector trade may in two ways positively affect utility of a household $X_A \sim X_B - i_{AB}$, where i_{AB} is the contribution of a social interaction between household A and household B to the utility of household A:

(1) Self-esteem may arise due to being 'employed'. Often economic models assume that labour means disutility because it decreases leisure. However, empirical studies on subjective wellbeing often show that unemployed people are less happy than employed people, even if controlled for income. Rätzel (2012) found that the relation between happiness and labour is an inverse U-shaped graph. Until a certain threshold, there is utility from extra labour. Self-esteem, but also the wish to use your own talents in order to help others, are reasons for that.

(2) For socially isolated people - for example because they are physically or mentally unable to maintain relations - the informal sector may be a form that eases contacts with the neighborhood. Even in case of absence of material gains from trade, those households will still be active in the informal sector since they gain utility by social contacts. The initial state of individual i can be described by $S_i^0 \equiv (y_i^0, P^0, C^0)$. y_i^0 is his income without the organized informal sector (in euro and time available for household production), P^0 is a vector with all

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[5] Saying it in the words of Ricardo, the difference in opportunity costs is a result of a timely shift of his relative productivity in cooking meals. For the Carnaval household one may say that their relative productivity in celebrating a party is higher during carnival.

prices without the informal sector (for formal goods (€) and household production(time)) and C^0 is a vector of the levels of all available non-material contributions to utility.

Then the informal market becomes organized, resulting in a new state; $S_i^1 \equiv (y_i^1, P^1, C^1)$. A household that does not get material gains from trade ($y_i^1 = y_i^0$ and $P^1 = P^0$), may still be willing to participate, since the change from C^0 to C^1 is evaluated positively; U(S^1)>U(S^0). His compensating variation, *how much money would have to be subtracted from his income in the new state to make him indifferent between the initial state and the new state with the subtraction from income* (Chipman & Moore, 1980), is positive, so he is even willing to have material losses from trade if these are not higher than the non-material gains.

The aggregate social gains from trade in the whole informal economy may have positive by-effects. More local interactions may stimulate community building and so decrease deprivation, criminality and other social characteristics of deprived neighborhoods. Besides all individual gains in purchasing power, this is especially the reason for the initiators to start the project. These social gains should also be taken into account when considering the *social usefulness* aim of the organized informal sector.

There may also be unemployed that have preferences for not being in interaction with other households. Those unemployed consider being in contact with others as a burden; they prefer to operate alone. Despite material gains from trade can be made, the total contribution to utility may be evaluated negatively: U(S^1)<U(S^0). If many potential informal participants get disutility from social interactions, this can be a threat to the viability of the informal economy.

Figure 2.4: Social interaction

Initial relative supply

Relative supply taken into account positive valuation of social interactions

Pc/Pw

Xc/Xw
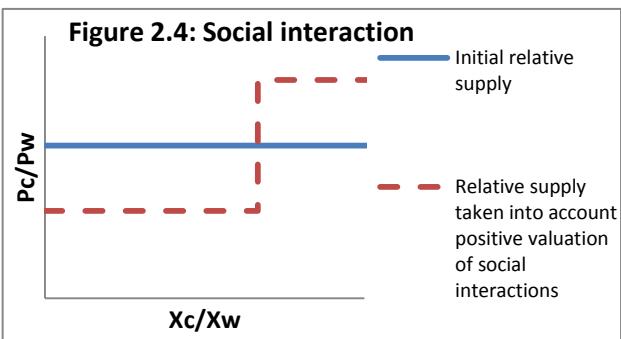
Finding 3: gains from trade can be made if social interactions positively contribute to utility

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2.2.3.4 Transaction costs

Once there is an interaction between two households, this has to be facilitated in a contract. The costs in making a proper contract with the right party are called transaction costs: the costs of searching information, the costs of bargaining and the costs to enforce the contract or to bear the risk of opportunistic behavior. For example, $X_A \sim X_B$ may not hold because there is uncertainty about the quality of goods/services from other households. If you clean your own windows, you know how to do it properly. Working in another household and receiving labour from another household requires communication about the expectations. Williamson (1979) defined three contract types. By choosing the right contract, transaction costs are minimalized.

- Classical contract: the identity of the parties is irrelevant, the good/service is defined in a standardized contract and the transaction procedure is completely formalized.
- Neoclassical contract: There are two trading parties, but there is additional governance of a third party that can be used in case of disputes. This is useful because the product/service is too complex (or it is too expensive) to put in a completely formalized contract.
- Relational contracting: under this contract, the transaction is based on long term mutual expectations. In deciding which action to perform, the entire relation as it has developed is of more importance than an initial agreement before the contract started.

Those contract types exist in the formal economy and will also appear in the informal economy. Some transactions will be under the classical contract, for example a hair-cut for a cake. Those are a product and a service that are quite standardized in the formal economy as well. Other transactions, for example babysitting for French lessons, require investment in a good fit to the preferences of the other party. Those transactions will evolve to relational contracts. By a lack of legal mechanisms to prevent opportunistic behavior and because of the small scale of the economy, it may be expected that most transactions will end up in relational contracting.

Finding 4: transaction costs may decrease the gains from trade

2.2.3.5 Economies of scale

Gains from trade can also be made if households specialize and get gains by economies of scale. *Economies of scale appear when long-run average total costs declines as output increases*. (Krugman, Wells and Graddy, 2009) Usually economies of scale appear in sectors with high fixed production costs. Moreover economies of scale can arise from a higher operational efficiency, skills and practices improve by experience.

The deprived households will especially use time as input in informal sector activity. So besides a few material inputs, most services and goods traded will especially cost time and effort (participants are money poor but time rich). For which types of goods and services will economies of scale appear?

First of all services that are not (or a little bit) rival and excludable in consumption. One evening of babysitting costs three hours. Whether there is one baby or there are five babies 'consuming' the babysitter services, does not cost more time. There are some variable costs, like more effort or transport to the babysitting place, but the marginal costs of every extra baby are comparatively low.

Further it may appear that a family operating in the informal market increases the efficiency of its production, i.e. to work faster or with less material inputs. A Surinamese woman making cookies may reduce waste of ingredients by developing more efficient ways to prepare them.

Finding 4: gains from trade can be made if there are economies of scale by specialization

2.2.3.6 Conclusion of aspects that contribute to gains from trade

The first condition for a viable informal sector is that there should be gains from trade. Ingredients that contribute (+) to or decrease (-) gains from trade are: differences in relative productivity (+), differences in opportunity costs through time (+), evaluation of social interactions (+ or -), transaction costs (-), economies of scale (+).

Note that the net gains from trade (g) can take every form, $0 \geq g > 0$ if all five aspects are taken into account. If social interactions negatively affect utility, the positive gains from trade (by differences in relative productivity) may be cancelled out. Therefore we define the first condition for a viable organized informal sector:

Condition 3: There should be *net* gains from trade for at least two households

2.3 Conditions for covering the operation costs

The organization of the informal sector requires effort and materials. There will be start-up costs, like launching the information mechanisms and the administration system. By maintaining the informal economy, there are also structural administration costs. Sources to finance the operation costs are:

(1) Fees and/or taxes paid by participants in the informal economy. In that case, a condition for the viability of the informal sector is that the gains from trade for the participants should exceed the

operation costs. A membership fee or a negative interest rate on balances (will be discussed in 7.2.3) are ways to stimulate informal trade. A tax on each transaction does not stimulate trade, but especially those who gain, will pay most. These fees and/or taxes may be charged in the local currency or in the national currency. (Lietaer and Hallsmith, 2006)

(2) Subsidies from the government. If the informal sector is subsidized, the directive that operation costs should not be higher than the material and/or social gains from trade (net social profit) should be implemented to maximize social welfare. However, uncertainty and a lack of information about the gains from trade may cause the government to deviate from the theoretically welfare-maximizing subsidy. Figure 2.5 shows that there are very few informal economies that are subsidized by the government.

(3) Private donations from households and businesses that are not participating in the informal economy. For them, getting insight in the way their money is spent and the social revenues of the project may be conditions to continue their donation. Donation may also be dependent on their wealth, usually correlating with fluctuations in the formal economy.

The main cost-recovery mechanisms for European Community Currency networks registered in the ccDatabase (2013) are displayed in figure 2.5. The CC networks without funding operate on voluntary work. Considering long-term viability of the informal sector, the preferred option is to let the participants pay for the fixed costs. Then, the dependence on external factors like subsidy policy and performance of the formal economy is minimized. This is what most community currency networks do (62%).

Figure 2.5: European CC networks on main cost-recovery mechanism
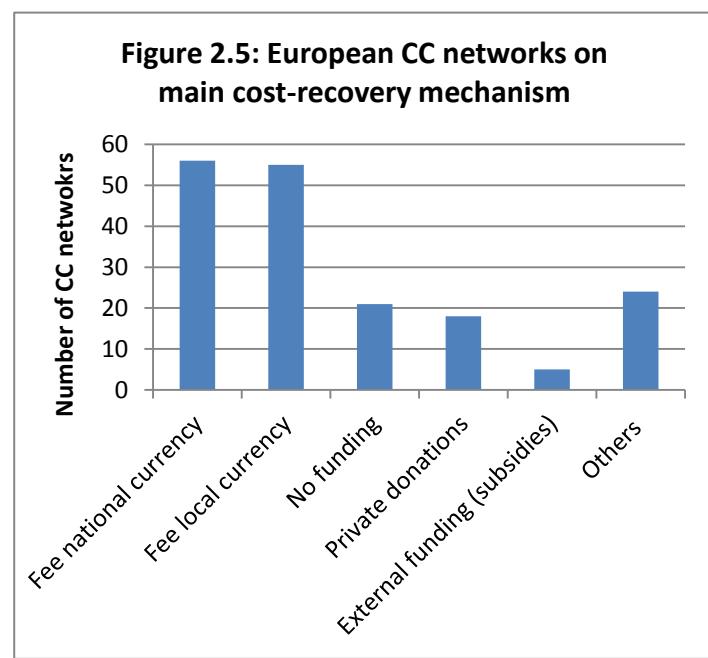
Condition 4: There should be structural funds to finance the operation costs. Those are dependent on the performance of the informal sector ((social) gains from trade) and external factors, like subsidy policies and the performance of the formal economy.

2.4 Overview of conditions

Concluding, the conditions that have to be fulfilled for a viable informal sector are:

- There should be overlap among households in the type goods and services produced and consumed
- The household should do something in household production of tradable goods/services (instead of using time for non-tradable production and leisure only)
- These ingredients should result in (net) gains from trade for at least two households:
  - o Differences in relative productivity
  - o Differences in opportunity costs through time
  - o A positive evaluation of social interactions
  - o Transaction costs
  - o Specialization which result in economies of scale

- There should be structural funds to finance the operation costs. Those are dependent on the performance of the informal sector ((social) gains from trade) and external factors, like subsidy policies and the performance of the formal economy.

BV De Zuiderling did several experiments with residents of Rotterdam South to explore the viability of the informal sector. The outcome is that there are indeed large productivity differences and other indicators in favour of a viable informal market. To provide funding, BV De Zuiderling chose to charge negative interest on the balances and a single contribution of €4.50 for each participant, so the participants pay in both currencies.

3. Interaction with the formal labour market

3.1 Introduction

A viable organized informal market does not automatically make the organization of the informal market a socially useful intervention. An intervention is socially useful if it contributes to the maximization of social welfare. Social welfare increases if gains are made by the prevention of labor over-capacity and by the creation of utility from social interactions, but these gains should not be exceeded by the social costs of unjustified unemployment benefit consumption and tax evasion. Since households are inevitably connected to the formal economic system, it is unavoidable that the supply of some goods and services will overlap and that participation choices in the informal economy affect participation choices in the formal economy. This chapter reviews to which extent the informal market affects the formal labour market and how negative effects can be minimized. The question that will be answered is 'What are the effects of the organized informal market on labour participation and how can the negative effects on the formal market be minimized?'.

3.2 Participation and welfare trap defined

Besides using labour-capacities of the un- and underemployed and providing possibilities to make *material gains from trade*, the informal market can be used to increase participation in general and so creating *social gains from trade*. As already explained in the introduction of this thesis, the participation of a household can be measured using the participation scale of the VNG (see figure 1.1). Marketing should be targeted to households within step two or three of the participation scale. A deprived household needs to have at least social contacts with other households; otherwise the information can hardly reach the household. Being on step two is a requirement for becoming interested. If the household is interested and visits an information event, it reaches step three.

Step four is reached when household decides to become active in the informal sector. Whether someone shifts to that step, depends on the attractiveness of the informal sector. If gains from trade can be made the household will join the informal economy and be in step four. To see whether the informal economy stimulates an increase to the fifth and the sixth step of this scale, it is good to review the concept 'welfare trap'.

The welfare trap is *the disincentive to go back to work* (Picard (2001), Saint-Paul (1995)). In economic literature it is a comparison between welfare without and welfare with formal job. Because of the unemployment benefit and other social subsidies for poor people, the difference between a formal salary and the income without a formal job, may be quite small (for the Netherlands, see Taner & Hendrix, 2007). The net gain in income with a formal job does, in some cases, not outweigh the loss in leisure. Therefore the welfare trap is defined here as: *the disincentive to take a job because the consumption and leisure set without formal job is preferred over the consumption and leisure set with formal job (more income, less leisure).*

The pattern that unemployment is persistent is called labour hysteresis or unemployment hysteresis (Blanchard & Summers, 1986). There are several mechanisms that support this pattern (Blanchard&Summers (1986 and 1989), Mikhail (2003)):

- Human capital devaluates during the period of unemployment. (Phelps (1972) and Hargraves-Heap (1980)). This will be considered in 3.3.2.
- Unemployment undermines work ethic (Mikhail, 2003), so the welfare trap increases due to a shift in preferences. This will be discussed in 3.3.3.

- Labour unions especially bargain on behalf of the employed. This is mentioned as the inside-outside theory (Lindback & Snower, 2002). The informal economy does not directly affect the labour unions, so this will not be discussed.

We shall see that the informal sector can provide incentives to escape from this long duration of unemployment, but that the informal sector also stimulates not to have a formal job, since the budget set of unemployed people increases relatively to the budget set of employed people[6].

3.3 Five effects of the informal sector on participation of unemployed

In this section, not the household, but one individual in a household will be the description unit. It is assumed that the individual is unemployed and receives an unemployment benefit. The informal sector affects participation choices of the person. Some individuals get incentive to increase participation and others are obstructed to increase participation. This section discusses five effects of the informal sector on participation. The leading question is: *how does the informal sector increase participation and how does the informal sector decrease participation and as such compete with labour in the formal sector?* A simple model showing the tradeoff between consumption and leisure is used to illustrate the options (Cahuc and Zylberberg, 2004:1). In the last sub section, ways to reduce the negative effects on the formal economy are discussed.

3.3.1 The informal sector increases unemployment income

Figure 3.1 depicts three consumption-leisure relationships that can be distinguished. It is assumed that the unemployment benefit, the red line, is fixed (not dependent on participation). In the previous chapter it was assumed that an unemployed person will be active in household production in his own house, or in 'random' informal activities[7]. This is not taken into account in the consumption possibilities described in this figure, but if the household increases consumption possibilities by these activities his consumption possibilities will not exceed the income in the organized informal sector.[8]

The hourly wage in the informal sector is assumed to decrease with labour supply, so the marginal returns on labour decrease (green line). Probably the informal market is quite small, so own supply may affect the equilibrium price. Even if the market is large, there are probably no labour contracts with a fixed wage, so a worker in the informal sector would first serve the best-paying clients and serve the less-paying clients if he

Figure 3.1: Job opportunity

Income/consumption (y-axis)

Leisure hours (x-axis)

— Unemployed labour curve

— Informal labour curve

- - - Formal labour curve (only available if there is a job offer and choice of hours)

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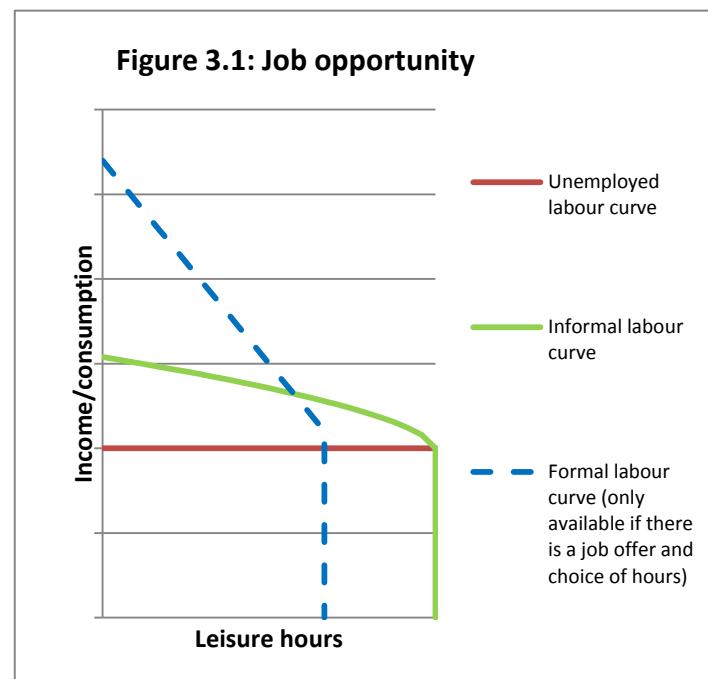
[6] Assuming that only unemployed households will become active in the informal economy.
[7] Black work or barter by coincidence.
[8] Except for workers that had very good informal contracts and encounter more competition by the informal sector.

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wants to supply more labour (gain more income)[9].

An income from the formal sector, the blue line, is not granted, but if a job is offered, the option appears. The employee has to work a minimum number of hours a week. The optimal number of working hours may be negotiated and recorded in the labour contract. Given that the deprived unemployed will probably take low-skilled jobs with fixed minimum hourly wages, the income line is linear starting at some minimum. Full participation in a formal job results in consumption possibilities much higher than full participation in the informal sector. The Dutch social security system obliges unemployed to accept every offered formal job, but by unmotivated behavior or little/ inappropriate job search, the individual can 'choose' not to accept a formal job.

With the organized informal sector, the worker has another option: getting a larger budget without being formally employed. If a formal job is offered then, the worker has to consider more options. How does the informal sector affect participation decisions of unemployed persons? It is assumed that the worker maximizes his utility, which may be of the form: $Max\ U(C,L) := L^\alpha * C^{1-\alpha}$ subject to $T = L + W$ and $C(W)$. With W=working hours.

How C depends on W differs per sector. For an unemployed worker, W=0, so C is independent of W. For an informal sector worker the effect of W on C is positive, but marginally decreasing. For a formal sector worker W contributes linearly to C (after the participation threshold). A worker's earning possibilities in both sectors and his preferences determine whether and in which sector he will participate. Suppose that a worker's 'maximized utilities' for each option are U_F (maximum utility formal job), U_I (maximum utility informal job) and U_u(maximum utility non-participation).

The moment *the formal job is offered*, four types of workers can be distinguished, based on their utility preferences and their capacities. They are described in Table 3.1 and depicted in figure 3.2. Which types increase on the participation scale and for which types does the informal sector give disincentive to increase on the participation scale?

Table 3.1		Will worker become active in informal sector? $U_I > U_U$ and $U_I > U_F$	
		Yes	No
Would person accept job if informal sector would not exist? $U_U < U_F$	Yes	Type D worker	Type C worker
	No	Type B worker	Type A worker

In figure 3.2, for each type a part of figure 3.1 is depicted with the utility lines that correspond with the three utility options. The situation for type A is a utility composition in which leisure is valued very high. This household will not be active in the informal and the formal sector. The informal sector does not give incentive to increase on the participation scale to step three and/or step four. The informal sector also does not give disincentive for these households to get a formal job.

Type B values leisure a little less than type A. The highest attainable consumption is reached in the informal economy. Without the informal sector, this person would prefer to be unemployed. The informal sector caused him to be on step 4 of the participation scale. By the possibility to become

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member of the informal sector, the welfare trap of this person increased. More effort from the government/company/organization is required to connect him to a formal job (step 5 or 6).

The type C workers choose for the formal job and are not attracted to quit that job for an informal sector job. Type C is already in the highest level of the participation scale, so the informal sector does not affect its participation.

Type D workers are persons that would have chosen for a formal job if the informal economy would not exist. Although those workers are risen to step 4 of the participation scale, the informal sector causes an increase of the welfare trap which prevents them from raising to the 5th or the 6th scale.

Figure 3.2: Different types of workers
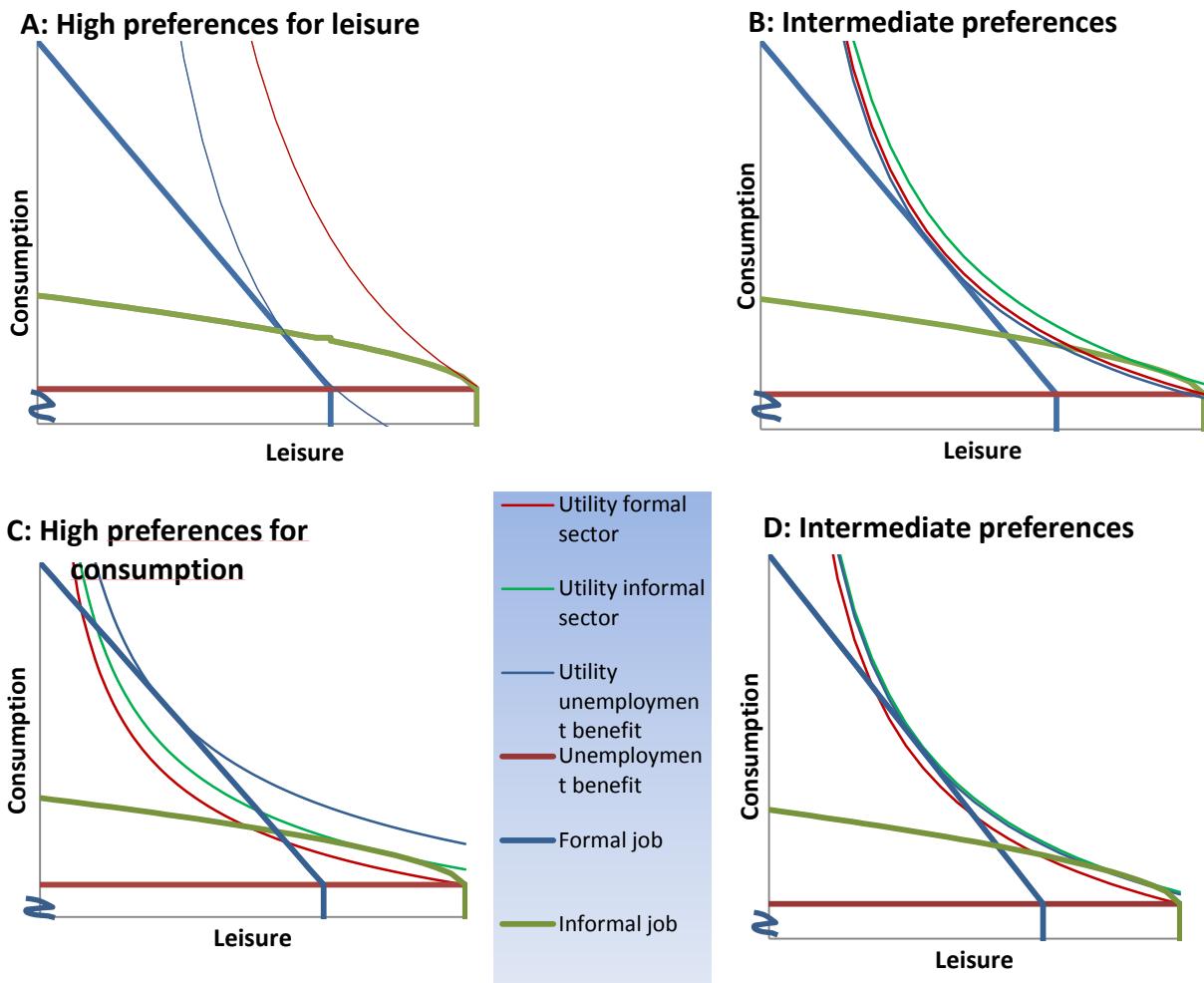
So considering the larger consumption set of an unemployed person, *how does the informal sector increase participation and how does the informal sector decrease participation and as such compete with labour in the formal sector?* If no formal job is available for an unemployed worker, the informal economy increases participation and does not compete with the formal labour market. Type B and D reach step 4 of the participation scale. If a formal job is available, the choice of the worker will be influenced by the informal sector option. Type D and B prefer the informal sector over a job in the formal sector. The growth of their consumption set (by informal goods) results in an increase of their welfare trap.

3.3.2 The informal sector increases skills and allows to send signals

One of the theories behind unemployment hysteresis is the devaluation of human capital (Phelps (1972) and Hargraves-Heap (1980) in Blanchard & Summer (1986)). If a worker becomes unemployed, his skills level is usually enough to participate in a formal job, because he practiced skills in his job. If he is not able to find a job quickly (because of his low education level or illness), his human capital decreases. The longer the duration of unemployment, the more skills he will lose, both in his profession but also in his general labour attitude (e.g. discipline to be on time). A period of unemployment gives a signal to potential employers. A business looking for an employee will offer a

lower wage to a long term unemployed person. This negative effect of unemployment duration on future earnings is shown in many studies (e.g. Jacobson et al (1993), Davis & von Wachter, (2011)). In figure 3.3 it is visible that if the household becomes unemployed, the incentive to start working again decreases because the income offers decrease. The person will get less job offers, with

Figure 3.3: Decrease of skills

— Unemployment benefit
— Income period 1
— Income period 2 (after job loss)
— Income period 3
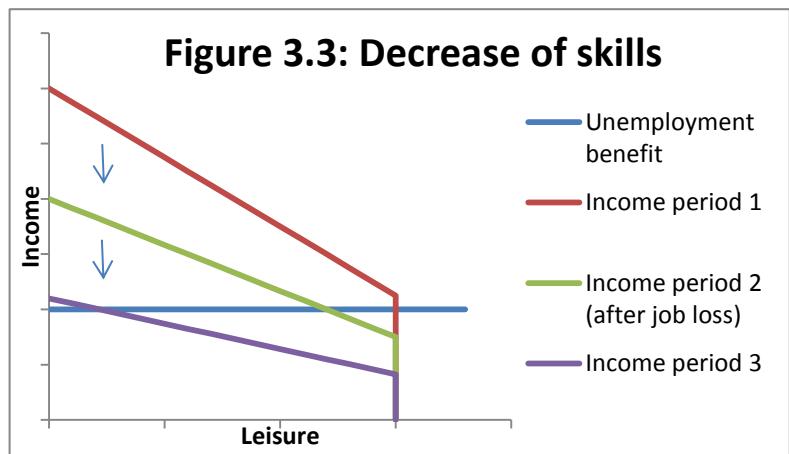
lower wages. The minimum wage prevents wages to be lower than the unemployment benefit in the Netherlands. So if the productivity of someone is very low or if the history of someone gives a negative signal, no job will be offered to him anymore.

Participation in the informal sector is one way[10] to give positive *signals* to future employers. To reduce the uncertainty about the investment they plan to do in their new employee. (Spence, 1973) Participation in the informal economy does not necessarily increase skills necessary for the specific working field, but more general aspect like the working attitude, discipline, concentration and social skills. An employer is willing to offer a higher wage rate to those who send good signals about themselves. By this, wage offers form the formal sector may be higher, so participation in the formal sector may increase.

If the increase in wage rate is very high, it may appear that a worker then decides to work fewer hours than he did before he became unemployed. The substitution effect from a wage increase stimulates him to work more, but the income effect stimulates him to consume more leisure. The relation between wage level and labour supply is called backward bending (Figure 3.4). The shift from a very low wage to a somewhat higher wage stimulates labour supply (since substitution of leisure with consumption of more goods and services results in more utility) but if the wage increases again to a higher level, the income effect makes that more leisure is consumed, since leisure is a normal good. If this happens, it is not
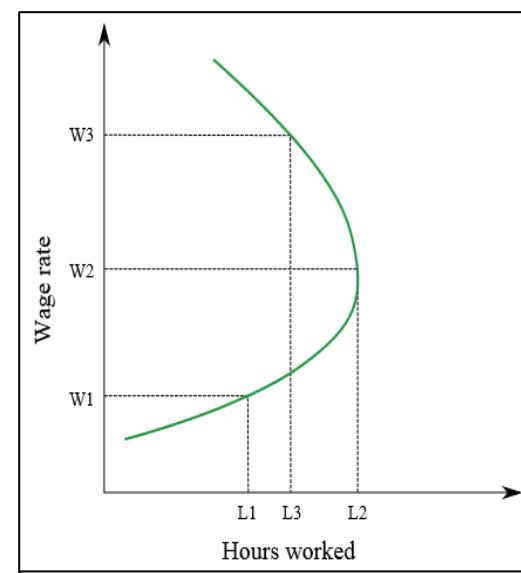
Figure 3.4 Source: Wikipedia.com

[10] Other ways are education, job-experience, race, sex etc.

really a threat to the formal market, since the worker is participating in step 6 of the participation scale, so independent from social security.

Thus, considering the signaling opportunity the organized informal sector provides, *how does the informal sector increase participation and how does the informal sector decrease participation and as such compete with labour in the formal sector?* Participation in the informal economy causes U_U to stay equal, U_I to exist (and to increase over time) and U_F to increase (see Table 3.2). If informal sector participation is a useful instrument for signaling in the formal sector, the formal wage may exceed the informal wage, so the informal economy stimulates types B and D to reach step 5 or 6 of the participation scale. Types A and C do not get higher skills via the informal sector, because they do not participate.

Table 3.2	Initial utility division	Shifts to which type if skills increase?	Goes up in participation scale?
A	$U_U>U_I$ and $U_U>U_F$	No shift	No
B	$U_I>U_U>U_F$	If there is a shift, then it is to type C	Yes, from 4 to 5 or 6
C	$U_F>U_I$ and $U_F>U_U$	No shift	No
D	$U_I>U_F>U_U$	If there is a shift, then it is to type C	Yes, from 4 to 5 or 6

3.3.3 The informal sector changes preferences

Besides the depreciation of human capital, a switch in someone's preferences is an explanation for unemployment hysteresis (Mikhail, 2003). The longer the unemployment continues, the more the person is able to deal with a small budget and the more he learns to enjoy leisure, especially if he is living among other unemployed persons. His relative preferences for leisure increase (Figure 3.5). This change in preferences contributes to the welfare trap, since a higher salary is necessary to convince those unemployed to become active in a formal job again. How will the informal sector influence these preferences?

Figure 3.5 Labour hysteresis from shift in preferences

- wage
- unemployment benefit
- optimal indiff curve period 1
- optimal indiff curve from labour period 2
- optimal indiff curve period 2
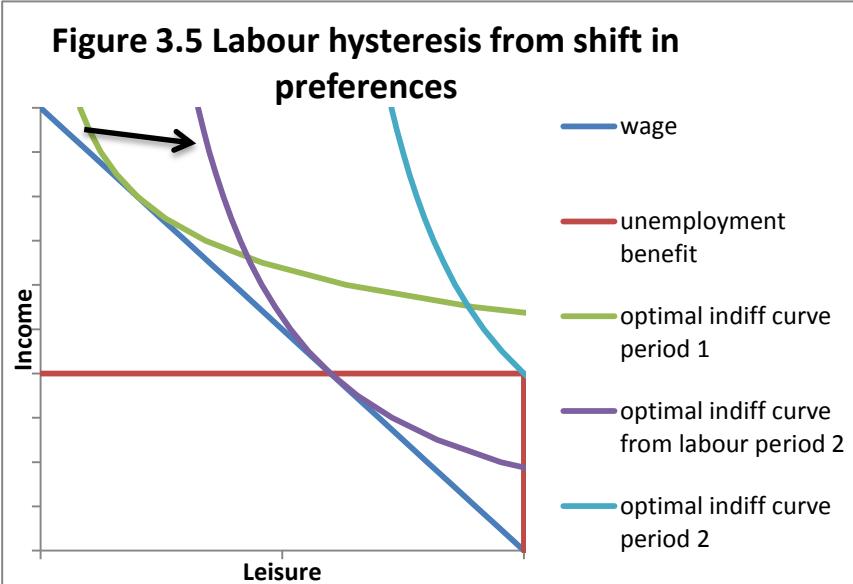
Becoming active in the formal sector obliges someone to work many hours in order to get a higher salary than the unemployment benefit. The informal sector, in contrary, offers a higher consumption outcome already for the first labour hour. The threshold to participate is much lower. By working a little, people can get used to work again and obtain some self-esteem.

Thus, considering the shift of preferences towards consumption that the informal sector may stimulate, *how does the informal sector increase participation and how does the informal sector decrease participation and as such compete with labour in the formal sector?* The informal sector increases participation by preventing people to get used to much leisure consumption and by making long term unemployed people getting used to consume less leisure and to have a little more

consumption possibilities. This means that types B and D increase to step 5 or 6 of the participation scale.

3.3.4 The informal sector decreases the effect of benefit reducing policies

As already shortly mentioned, government instruments that are used to get type B and type D persons to a formal job are weaker by the existence of the informal sector. In this sector, the policy towards unemployment benefits will be reviewed.

Until now we made the simplification that a stable unemployment benefit is always available for each unemployed person, but in reality the payment varies depending on the status of the receiving person. At first, the unemployment benefit depends on the wage level in the last job. These payments are received for some months, dependent on the formal employment time before the job loss. The costs are covered by social insurance funds to which every employee in the Netherlands contributes. When that period is expired, there is a basic unemployment benefit of which the level is dependent on the family composition. This is paid by the government. However, even this payment can be reduced if it is observed that the recipient does not fulfill his job-search requirements or does not cooperate in the trajectory to a formal job. The government may use payment reductions as an instrument to increase job participation, although ethical and distributional policies prevent the government from using it too extremely (van der Veen et al., 2002). Especially the shift from payments that depend on the wage in the former job to the low basic unemployment benefit is researched quite intensively. Usually such research focusses on the optimal payment and duration level: the design of social insurance (e.g. Lauringson (2011), Lalive et al. (2005, 2011), van Ours & Tuit (2010), Boone et al. (2009)).

In general, if the unemployment benefit decreases, the incentive to get a formal job increases since the maximum feasible utility in the informal sector (U_I) and the maximum feasible utility of being non-active (U_U), decrease (Figure 3.6). The effect is that type B and D workers will shift to type C and workers of type A will shift to type B, C or D. If the government (gradually) decreases the unemployment benefit to give incentive to formal job

Figure 3.6: Unemployment benefit decreases
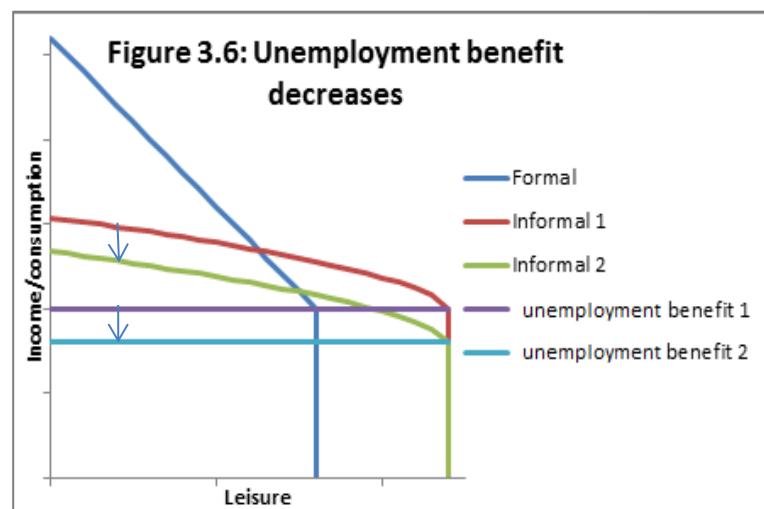
participation, the organized informal sector makes this instrument less powerful. Without the informal sector, type A and type B workers (both without formal job) would only have a choice between a formal job and no job (informal work at coincidence of wants). With an organized informal sector the difference in income between a formal job and no formal job is smaller. More unemployment benefit reduction is necessary for them to let the formal job be the optimal choice.

Thus, considering the effect of the informal sector on benefit-regulation instruments of the government, *how does the informal sector increase participation and how does the informal sector decrease participation and as such compete with labour in the formal sector?* The informal sector increases the welfare gap of types B and D by the possibility of increasing purchasing power, so the

usual effect of a benefit reduction by the government is limited: participation up to the 5th or 6th step decreases (relative to the case without informal sector).

3.3.5 Fluctuations within the informal sector affect participation

There is also a mechanism within the informal sector itself that affects participation incentives in the informal and the formal sector. There will be shifts in the profitability of the informal sector. Those are dependent on:

(1) Characteristics of the person itself: The longer and more a person is active in the informal sector, the more experience in how to deal in the informal sector he gets. His consumption-leisure tradeoff curve expands (Figure 3.7- going up). For type B and D workers this means a larger welfare trap. Actually it is an increase in human capital

Figure 3.7: Shift in variety of goods

- Formal income
- Unemployment benefit
- Informal income I
- Informal income II

(y-axis: Consumption, x-axis: Labour hours)

specifically for the informal sector. From a certain level, the labour supply of those workers may decrease by the income effect (backward bending labour supply).
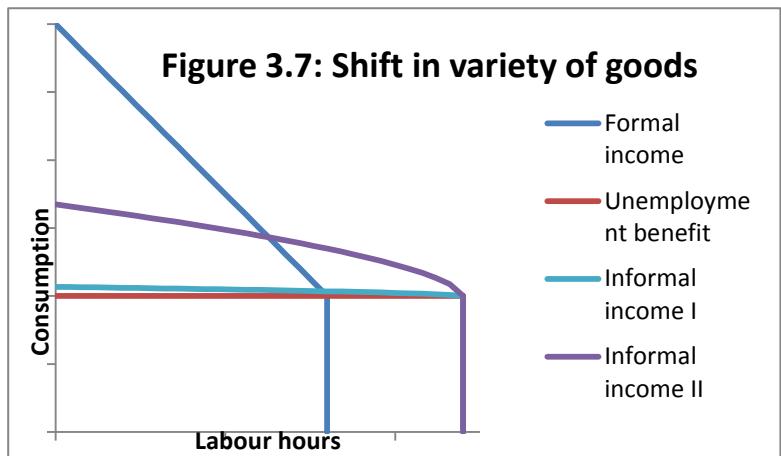
(2) Characteristics of other participants in the informal sector: At the start of the project, if few households are active in the informal economy, not much variety in services and goods will be offered. If more households become active in the informal economy and the variety of goods and services will increase, it becomes easier to change informal sector wage for goods and services that contribute to utility (Figure 3.7- going up). On the other hand, with more participants, individuals may face a loss in informal sector purchasing power because they face competition from other households with comparable skills (Figure 3.7- going down).

Thus, considering mechanisms in the informal sector itself, *how does the informal sector increase participation and how does the informal sector decrease participation and as such compete with labour in the formal sector?* If the informal sector labor supply curve goes up by more profitable trade opportunities, the welfare trap for type B and D increases. The incentive to start participating in the informal sector increases, so for type A it means a possible increase to step 4 and for type C it means a possible decrease to step 4. If the profitability of informal sector participation decreases, because of competition or absence of enough variety in goods and services offered, the welfare trap for type B and D decreases. For type A there is less incentive to participate (no increased participation to step 4) and type C has no increased incentive to leave the formal sector and become active in the informal sector (stays on step 5 or 6).

3.3.6 Conclusion: ways to reduce gains from trade

Concluding, the organized informal sector has two effects on participation:

(1) It stimulates households to use labour that otherwise would not be used; households have more incentive to participate. They reach step 4 of the participation scale. Further, participation to the subsidized or unsubsidized formal jobs (step 5 and 6) is stimulated by a change in preferences, by signaling possibilities and a gain in general labour skills.

(2) However, the additional income from the informal sector increases the welfare trap: the incentive to accept a formal job is lower. If many workers choose not to participate in the formal economy and receive the unemployment benefit instead plus some income from the informal sector, this may harm social welfare. They are tempted to be free rider in the public goods that the government provides.

This results in a paradox. On the one hand is it necessary to have gains from trade: to use over-capacity, but on the other hand gains from trade result in a situation that is too good for an unemployed person: a situation that increases the welfare gap. How to minimize these social costs of tax evasion and unnecessary unemployment benefit consumption? The fairest way to do so is to reduce the unemployment benefit of participants.

The government offers an unemployment benefit to those that are not able to earn money in a formal way. If the income of an unemployed person increases by participation in the informal sector, it may be considered ´fair´ if his unemployment benefit decreases. Of course this may be a reason not to participate. Peacock (2000) mentions that LETS in the UK are so small because earnings in the informal sector are deducted from their unemployment benefit. Being paid in the local currency and having to 'pay' (to hand in) in the national currency was a reason for them not to participate because the local currency was not convertible into the national currency. To prevent this, the government may decide not to limit the unemployment benefit with a value equivalent to the informal income, but a lower value. Another option is to reduce the unemployment benefit only if a certain threshold of informal income is reached.

> Condition:
> A reduction in the unemployment benefit as a result of informal sector activity should be feasible

> In its business plan BV De Zuiderling reports that the initiators are currently working on an agreement with the government. They try to arrange informal participation without reductions on the unemployment benefit. The initiators expect the positive effects on formal employment via the development of skills and self-esteem to exceed the social loss of the increased welfare gap.

3.4 Being active in both the formal and the informal economy
What if a household is allowed to participate both in the formal and the informal economy? There are two reasons for being active in the formal and the informal economy:

1. *The informal wage is higher until a threshold.* It is assumed that the labour-earnings relation in the formal sector is linear (fixed hourly wage) and the labour-wage relation in the informal sector is exponentially decreasing, so there may be an optimizing choice in which the household practices all informal work until the slope of his informal wage equalizes his formal wage. In this case, informal working hours replace formal working hours.
2. *Formal working hours are restricted.* For most jobs, the Dutch law subscribes that a working day may not be longer than eight hours. A worker that has much preferences for consumption may decide to work additional hours for an informal income. In this case formal working hours are not replaced by informal working hours. Besides indirect effects, like a possible reduction in the effort of formal workers, there is no interaction between the formal and the informal sector.

Because this chapter deals with interactions between the formal and informal labour market, only the first reason will be considered.

Note that when participating in both sectors, the household can consume from the formal (X_F) and the informal sector (X_I), but it does not get an unemployment benefit since he is voluntarily unemployed. The initial situation of a worker considered in this section, is that he has a formal job. Now, the informal sector is introduced and he is able to reclassify his time. The utility from a combination of formal and informal jobs (U) may be described with a Cobb Douglas function:

$$U(X, L) := L^\alpha * X^{1-\alpha} \text{ with } 0 < \alpha < 1$$

and the consumption, X, exists from goods/services from the formal and the informal sector:

$$X(X_F, X_I) := X_F + X_I \text{ with } X_F \sim X_I$$

All time available is used for production in the formal and informal sector and for leisure.

$$X_F(A_F), \ X_I(A_I) \text{ and } T := A_F + A_I + L$$

Which division of labour hours among the informal sector, the formal sector and leisure is optimal? Since the wage of the informal sector is dependent on the number of labour hours supplied, it is attractive to be active in the informal economy until the slope of both income functions is equal. The equations for wages and income are:

	Wage	Income
Formal	$w_F := w$	$i_F := w * A_F$
Informal	$w_I := A_I^{\beta-1}$	$i_I := A_I^\beta$

It is attractive to be active in an informal job until the slopes of i_F and i_I are equal; $\frac{\partial i_I}{\partial A_I} = w$. In Figure 3.8, three different situations are depicted. The first two figures depict situations of workers that are focused on one of the two sectors. Note that the worker that works in the informal sector only, should have a really good offer for the informal sector, since he does not get any unemployment benefit. For the third figure a combination of both sectors is preferred. The person supplies a share of its labour on the informal sector, and a share on the formal sector.

Figure 3.8: formal and informal sector combined?
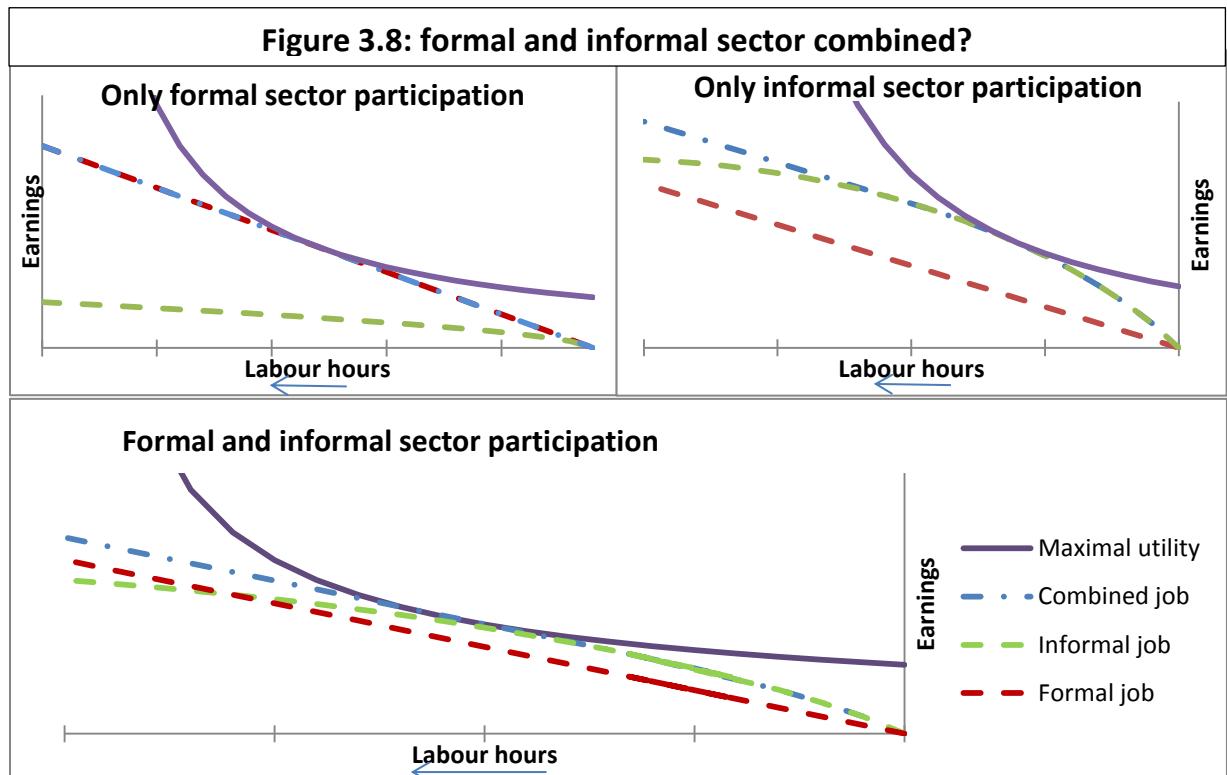
The blue line displays the new tradeoff between consumption and leisure. Per household the consumption (earnings) will differ by skills and preferences.

If a household can be active in both the informal sector and the formal sector, there is no threat that it prevents people from being on a higher step on the participation scale, because those people are already fully participating. However, productive labour is subtracted from the formal labour market. This may result in the following changes in social welfare:

- The informal sector stimulates employed households to work less (if start wages are higher in the informal sector) which creates more scarcity on the formal labour market. For formal companies this loss in labour force may be harmful especially if you take into account that households with specific skills gain in the informal economy, so the loss in labour supply cannot easily be filled up other comparable employees (qua wage/skill relation). This may have a negative effect on social welfare.
- Scarcity on the formal labour market results in a higher equilibrium price for labour, which stimulates unemployed persons to become active in the formal sector. This provides a positive contribution to social welfare.
- If the informal market is facilitated well, local formal companies/workers may be tempted to shift all their activities to the informal sector, since taxes and regulations can be evaded. If many companies will do so, this has negative consequences for social welfare, since they become unjustified free riders.

To reduce the negative effect on social welfare, it is important that the informal sector is not too attractive to formal workers. Applying the same taxes and rules on informal activities would destroy the informal economy (since most participants were not able to allocate their labour formally), but having some regulations and levying some taxes should be feasible. For a formal company, the gain of doing business formally should be higher than doing business informally (lower taxes, but costs to switch to formal economy and less legal rights).

Condition: It should be possible to levy taxes and to apply regulations on informal activities

In accordance with guidelines of the Dutch Tax and Customs Administration, BV De Zuiderling does not have to levy taxes, but only needs to report all transactions. Users of the informal economy are obliged to report all revenues above the threshold of 3000 units (not clear which units) on a yearly

4. Interaction with the formal market for goods and services

4.1 Introduction

As the informal market will interact with the formal market for labour, it will also interact with the market for goods and services. A necessity for participation is that wage earned in the informal sector should be spendable on useful goods and services, otherwise the wage will be considered too low to participate. Besides informal goods/services that were not consumed before, there will probably also be goods/services in the informal sector that were consumed before. How do those shifts affect the formal economy? The question that will be answered in this chapter is 'Which are the effects of the organized informal market on the formal market for goods and services and how can the negative effects on the formal market be minimized?'.

4.2 Model

In order to get insight in demand changes for formal goods by the organization of the informal sector, a simple household choice model with two consumption goods is described. Goods can be obtained from household production or from the unemployment-benefit budget. Products from household/informal production are called x_i and equivalent goods from the formal sector are called t_i. A household is indifferent between x_i and t_i: $t_i \sim x_i$.

Before the organization of the informal sector, household production (and some informal trade on coincidence) allowed households to consume x_i, but for a sacrifice of leisure, expressed in labour time: L_i. After introduction of informal sector, the time sacrifice decreases by gains from trade as described in chapter 2: $L_i(\text{period } 1) \geq L_i(\text{period } 2)$.

x_i= home produced/informal goods/services	i: 1,2
L_i= labour time good i (labour= only input)	i: 1,2
t_i= formal sector goods/services	i: 1,2
p_i= price formal good i in euro	i: 1,2
T= total time available	
S= unemployment benefit in euros	
F=leisure	

Objective function:

$$\max U = (x_1 + t_1)^\alpha + (x_2 + t_2)^\beta + F^\gamma$$
$$0 < n < 1, n = \alpha, \beta, \gamma$$

Subject to

$$T = F + L_1 x_1 + L_2 x_2 \text{ and } S = p_1 t_1 + p_2 t_2$$

4.2.1 Period 1

Keeping preferences, leisure and unemployment benefit levels equal, a households utility and its optimal choices depend especially on its skills and social contacts with other skilled persons. L_i expresses the time the household spends on obtaining one consumption good x_i. For some goods, the L_i will be comparable among households, but e.g. for sewing (producing cloth) the L_i will differ. A household that does not have skills to sew will choose not to 'buy' cloth via household production (x_i), but in the formal sector (t_i). (see table 4.1) The optima are obtained by the Excel solver.

Table 4.1 $\max U = (x_1 + t_1)^{0.7} + (x_2 + t_2)^{0.7} + F^{0.7}$ p_1= 1.5, p_2=1, S=10, T=10	Cloth consumption		Food consumption		Leisure consumption	Optimal utility
	formal	informal	formal	informal		
Hh 1 (L_{cloth}=2, L_{food}=1)	2.1676	0	6.7486	1.6257	8.3743	10.5717
Hh 2 (L_{cloth}=0.7, L_{food}=1)	0	9.9547	10	0	3.0317	12.1815

4.2.2 Period 2

L_i(period 1)≥L_i(period 2), so household production prices decline if the informal sector becomes organized. Does the change in L_i affect demand for t_i? Optimizing the objective function subject to the two constraints and getting an equation of the optimal t_1 and t_2 is possible, but the best output I got was very long and complicated. Therefore I decided to use the solver function of Excel again. This allows you to see the effects of a decrease in L_i on the behaviour of the two households described in table 4.1.

Table 4.2 $\max U = (x_1 + t_1)^{0.7} + (x_2 + t_2)^{0.7} + F^{0.7}$ $p_1=1.5$, $p_2=1$, S=10, T=10	Cloth consumption		Food consumption		Leisure consumption	Optimal utility
	formal	informal	formal	informal		
Hh 1 ($L_{cloth}=1$, $L_{food}=1$)	0	5	10	0	5	11.1822
Hh 2 ($L_{cloth}=0.7$, $L_{food}=0.7$)	0	9.9547	10	0	3.0317	12.1815

Now the informal sector is created with its own relative equilibrium price: $P_{cloth}/P_{food}=1$. This price is formed on a perfect market with many suppliers and demanders with all different skills. Both households produce the good they have comparative advantage in. The first household is now able to supply 1 food for 1 cloth, so his L_{cloth} declined from 2 to 1. The second household is now able to supply 1 cloth for 1 food, so his L_{food} declined from 1 to 0.7. Household 1 decided to buy all cloth informally (traded for home produced food) and to consume less leisure. Household 2 did not change its consumption pattern because the unemployment benefit was already spend on food. The informal price decline was not enough for him to switch his consumption pattern, so he does not gain from the organization of the informal sector. In the real world with many different goods and services, he would probably have changed some consumption patterns.

4.2.3 Effects on the formal market

What is the effect on formal companies? The formal cloth supplier loses, since the relative price for cloth is higher on the formal market than it is on the informal market. Household 1 was his client in period 1, but his sales decrease by 2.1676 (under the same price). The formal food supplier gains, since the money that is not spend at the cloth supplier, is now spend on food. Given the low relative price for cloth, there should also be households that are very good in producing cloth and willing to buy informal food for 1 unit of cloth. Do they exist? Would they not like to produce and consume their own cloth, and spend their unemployment benefit in the formal sector? If (1) they do not have a specific preference for informal local food, (2) if the informal price mechanism works perfect and (3) if switches in spending can easily be made (no long term contracts), the relative price of cloth on the informal market will increase until it reaches the level of the formal prices.

However, if those three conditions are not fulfilled, differences in relative price levels between the formal and informal market may exist. Then, the optimal consumption choice for a formal product is both positively influenced by the price of its own equivalent and negative the other way around. If the informal price of food would decline, the informal cloth supplier would gain some clients back. This illustrates that demand for products from formal companies will decrease if the good/service they supply is also (for a lower relative price) supplied on the informal market. Suppliers of substitutes will lose.

In contrary to time, S has no intrinsic contribution to utility, so S will be spend fully in the formal sector (assuming that there are no savings). Therefore, there are also formal companies that gain. Formal suppliers of substitutes with a low relative price, formal suppliers of complements (jewellery to combine with the cloth) and formal suppliers of inputs (fabric for cloth, rice, flower etc for food)

will gain. Especially the latter, a rise in sales from a general increase in economic activity, may be a very positive effect on the formal economy.

4.3 Tradability

Will all formal suppliers of goods that are supplied in the informal economy lose from the organization of the informal market if they charge a higher relative price? Given the small budget, the poor household especially buys basic goods in period 1. There are some luxury goods that poor households will never buy on the informal market. Examples are luxury dinners in a restaurant, expensive jewellery, but also childcare (the nursery). They are not bought formally, but they can be produced at home. Those goods/services that are (initially) not traded between the 'rich' and the 'poor' can be defined as *non-tradables*.

Tradability is the property of a good/service that it can be sold in another location distant from where it was produced. In reality, the property tradability is present in goods and services as a degree rather than an extreme (fully tradable or non-tradable), since the definition of basic needs may differ per household (visiting a pop-concert may by some households be seen a basic need). The 'distance' described is in this case not a geographical, but a social distance: the distance between the average poor and the average rich person by a difference in their budget set and the ability to supply their labour resources. Since unemployed are unemployed, they are (temporarily) not able to give labour in return for the trade flows, but they have a given limited budget (S) with which they buy *tradables*, the goods that are traded.

Formal companies that supply substitute goods that are *non-tradables* will hardly be affected by the organization of the informal market, since the poor households have never been their clients. A luxury restaurant will not face competition from an old poor lady that starts an own small restaurant within the informal sector. Formal companies that supply substitute goods that are *tradables* may face competition from the organized informal sector. A deprived household may, for example, decide to buy bread in the informal sector instead of buying it at the bakery.

4.4 Minimizing negative effects

Formal suppliers that offer relatively expensive substitutes of goods/services supplied in the formal sector may lose customers. Suppliers of relatively cheap substitutes, complements, and suppliers of informal sector inputs will face increasing sales. For large companies that supply many different goods, like the Albert Heijn, these effects are neglectible. However, for small companies that are specialized in one field, like a small local hairdresser, the reduction in sales may be severe and even lead to bankruptcy. From a societal point of view, competition may be efficient, so an informal hairdresser that performs better than a formal hairdresser may get a higher reward. However, given the absence of taxes and administration, quality and safety requirements, the informal competition may be considered as unfair. The absence of taxes and regulations may even stimulate formal workers to switch to the informal market (section 3.4).

On the other hand, equal treatment of formal and informal activities would also give problems. If informal sector producers (especially of non-tradables) should fulfill so many requirements, they will drop out again. They used to be unemployed by a reason and this will also hold if all activities should be formal immediately. Especially the market for non-tradables will not be viable with so many requirements. The government may decide to have different requirements for the informal sector: a lower tax and less safety requirements, but a restriction on the size or turnover of the informal

'businesses'. In this way formal businesses are not attracted by switching their activities to the informal economy.

4.5 Conclusion

Which are the effects of the organized informal market on the formal market for goods and services and how can the negative effects on the formal market be minimized? In general formal suppliers of relatively expensive substitutes may loose and formal suppliers of relatively cheap substitutes, complements and inputs may gain. In order to avoid unfair competition or formal activities shifting to the informal market, research is required to design the optimal taxes and regulations package for informal activities. The challenge is to find an optimal compromise between full taxation and regulation and absence of taxes and regulations. And a condition for the system is again that:

Condition: It should be possible to levy taxes and to apply regulations on informal activities

In accordance with guidelines of the Dutch tax institute, BV De Zuiderling does not have to levy taxes, but only needs to report transactions. Users of the informal economy are obliged to report all revenues above the threshold of 3000 units (not clear which units) on a yearly basis.

Monetary part

How can a local currency contribute to the facilitation of the conditions found in the real part?

5. Introduction to the monetary part

The first part of this thesis provided conditions that have to be fulfilled in order to make the introduction of an organized informal sector socially useful. Those conditions can be split in two groups: (1) conditions dependent on characteristics of the neighborhood and the workers living there and (2) conditions that can be shaped by the initiators and/or the currency system that is used. They are grouped in Table 5.1. The latter aspect, the currency system, has our attention in this second part of this thesis. A currency cannot facilitate everything. It eases transactions, but conditional on the existence of a (virtual) market place, suppliers and demanders and many other requirements. Just creating a currency system is not enough. Nevertheless, the type of currency and the way in which it is governed does influence the social usefulness of the informal economy. The aim of this second part is to discover how and in which form a local currency system optimally contributes to the feasibility of these conditions.

Table 5.1	
Conditions that should be fulfilled by inhabitants of RS	**Conditions to which a complementary currency system can contribute**
- Differences in relative productivity - Differences in opportunity costs through time - A positive evaluation of social interactions - There should be overlap among households in the type goods and services produced and consumed - The household should do something in household production of tradable goods/services (instead of using time for non-tradable production and leisure only)	1. Minimized transaction costs 2. Specialization which results in economies of scale 3. There should be structural funds to finance the operation costs 4. A reduction in the unemployment benefit as a result of informal sector activity should be feasible 5. It should be possible to levy taxes and to apply regulations on informal activities

The main question of the monetary part is: How and in which form can a local currency system contribute to the facilitation of the conditions found in the real part? A currency system includes all general issues in the creation, administration and management of the currency.

Chapter six discusses the role of money as mediator in transactions. If transactions are done by barter there should be double coincidence of wants, it would be very difficult to buy expensive products or to delay expenses (difficulties in saving and borrowing). Therefore, the use of a monetary commodity contributes to condition 1: a reduction of the transaction costs.

In chapter seven the characteristics that the monetary commodity should have are discussed. First the option to use the euro is reviewed. By its familiarity, the euro will easily be accepted as means of payment. However, the euro showed to be unable to connect all unmet needs with the over-capacity that exists. A local currency may be governed more specifically focused on the situation of Rotterdam South, thereby competing with the euro. The form that the local currency should take is discussed for several dimensions: the type of currency, its standard of value, its store of value and its degree of convertibility. With the available knowledge of the case of Rotterdam South and considering the conditions from table 5.1, the optimal choices are made.

Because the initiators of the Zuiderling chose to create an inconvertible currency, it will be a challenge to guarantee credibility and stability of the Zuiderling. Chapter eight discusses sources of instability and instruments to deal with instability. These ways to combat instability contribute to the conditions of table 5.1 via a decline in transaction costs (less uncertainty) and a way to generate funds (condition 3).

6. Role of money

6.1 Introduction

As already discussed in the introduction, people without access to the labour market can be helped by creating a new local market. Following the steps of Perlman (1971), first the information mechanism contributes to efficiency in trade, by a reduction in search costs. How this exactly will be formed in Rotterdam South is described in the business plan of the project (Manders & Kromwijk, 2013), but a discussion of this is outside the scope of this thesis. The second step in creating an efficient market is the use of a monetary commodity, a commodity that everyone accepts as payment. This reduces the number of stalls on the (virtual) market to n-1 (see section 1.2). The misunderstanding about the role of money and the advantages of using money to facilitate transactions will be discussed in this chapter. The question that will be answered is 'How can money contribute to the facilitation of the conditions found in the real part?'.

6.2 Quantity theory of money

In the debate about community currencies it is often an assumption that creating more money results in more transactions, a better ability to use (labour) resources, so in the end a richer community (e.g. in Lietaer and Hallsmith, 2006). However, instead of having a fixed value, money is neutral (Hayek in Keynes, 1931). Its value depends on the other economic circumstances. This is explained by the Quantity Theory of Money, which is developed early in the 20th century by a group of economists including Fisher (1911), criticized during the economic depressions around the World Wars by Keynes and reintroduced by Friedman (1956). The simplest equation of the quantity theory of money is M*V=P*T. All money in circulation (M) times the velocity (V) should be equal to the sum of all payments in all transactions, a vector of prices (P) times a vector of transactions (T). Assuming a constant V and T (or an exogenous growth rate), the theory supposes that an increase in the money supply only affects the price levels, not the real output or real prices. That makes the long-term impact of money creation (e.g. the introduction of a new currency) zero, except if the characteristics of the currency affect V. A structural change in transactions can only be reached if the current monetary commodity does not fulfill all the functions that money should have. If another currency is more able to fulfill these functions, that is if the currency is able to connect unmet needs and unused resources, the introduction of a new currency may affect V and in this way increase T. The functions that money should have will be discussed in the next section.

6.3 Functions of money

If money already exists, the creation of extra money may only be useful if it differs from conventional money; if conventional money is no longer able to fulfill the functions of money. What are those functions? Money should reduce search and transaction costs and it should provide the possibility to save the 'claim on value' over time, giving more certainty, the ability to do big expenses or to delay expenses.

Jevons (1875) wrote one of the first books about monetary theory. He distinguishes four functions of money. Later, macroeconomic textbooks rearranged them into three functions of money (e.g. Mankiw & Taylor, 2007). The three functions of money are:

Medium of exchange: This role of money is often mentioned as the most important function of money.
'Money is simply any commodity esteemed by all persons, any article of food, clothing, or ornament which any person will readily receive, and which, therefore, every person desires to have by him in

greater or less quantity, in order that he may have the means of procuring necessaries of life at any time.' (Jevons, 1875)

The commodities used for money have differed per culture and region. Examples are gold and shells. In the 20th century almost all money became *fiat money*. The objects themselves (coins and paper money) do not have intrinsic value. It is scarce because it is controlled by the (inter)national Central Banks.

Unit of account: Jevons calls this function the *common measure of value.* Such a commodity, which is accepted by every trader, becomes a tool to compare. Examples are to compare the profit of this year with the profit of last year, to compare the value of two goods, or to make a cost-benefit analysis. Since the value of every good can be expressed in the monetary commodity, the monetary commodity should be convertible into all types of goods and it should be possible to convert all types of valuable goods into the monetary commodity. In order to smooth transactions, money should be fungible (that a trader is indifferent between 2 note of 5 euro and one note of 10 euro), easily divisible in smaller or larger units and stable in time and place; otherwise comparisons over time and within regions do not make sense.

Store of value: This function of money is that it should be possible to save it and to retrieve it at later time without losing value (equivalent to the *standard of value function* of Jevons). This enables people to save the 'claim on value' through time, giving more certainty for the future and the ability to do big expenses. If someone wants to lend or borrow in the economy, it is inconvenient to do it in a commodity like cakes. Suppose hh A lends 10 cakes to hh B, because hh B gives a party. Hh B promises to pay back 10 cakes to household A, but there is uncertainty about the pay back moment and the value of cake (that fluctuates by input prices). It is, then, useful to borrow and lend in a commodity with a stable value. If the loan is done in money, hh A knows that the value it will get in the future is as high as the value of the 10 cakes produced now. Safe investments like art and real estate also fulfill the store of value function. Jevons (1875) mentions the store of value function of money to be '*something which is very valuable, although of little bulk and weight, and which will be recognized as very valuable in every part of the world'*; characteristics that in macroeconomic books are mentioned under the function unit of account.

6.4 Conclusion

Some workers are not able to find someone that wants to convert their labour resources into the monetary commodity. If their labour resources have value, one may say that for them the unit of account function is not fulfilled. This problem may be a short-term problem due to an economic recession, but for others it may be a long-term problem since public regulations (like minimum wage) prevent employers to buy their labour resources. They will supply their labour resources on the informal market and trade via barter and/or within small networks. The organization of the informal market including the use of a currency (the euro or another currency) may be very useful for them to optimize their gains from trade.

Money then serves as an information mechanism, prevents the necessity of double coincidence of wants and enables the possibility to save the claim of value in order to do big expenses or to get certainty about future spending possibilities. So money contributes to condition 1 of table 5.1; it reduces transaction costs of informal trade.

7. The optimal currency system

In this chapter it is assumed that the organization of the local informal economy is desirable and that a currency should be used. Many different types of local informal economies with community currency systems exist and have existed. The question of this chapter is 'What are the optimal choices in designing a community currency system?'. The first section argues why the euro is not the optimal currency to use. The second section describes choices that have to be made in establishing a community currency. The conclusion will provide a provisional advice about which currency to use in Rotterdam South.

7.1 Reasons not to use the euro

7.1.1 Make the organized informal market exclusive

If the euro would be used, people from Rotterdam North (for simplicity defined to be formal workers) could as easily participate and enjoy the benefits as people from Rotterdam South (for simplicity defined to be (formally unemployed) informal workers). By using an own currency and distributing it among Rotterdam South only, inhabitants of Rotterdam North are excluded. It is possible that there are trade mechanism between the formal and the informal economy. Some initiators specifically choose to make a currency convertible into the euro (see section 7.2.4). Even if the currency is not convertible into the euro, households from Rotterdam South may facilitate deals between a household from Rotterdam North and an informal worker in Rotterdam South, in exchange for euros. Although this is possible, the level of transaction costs will probably prevent the formal and the informal market to be fully integrated. In this way, especially the inhabitants of Rotterdam South gain from the new trade possibilities that arise by the organization of the informal sector.
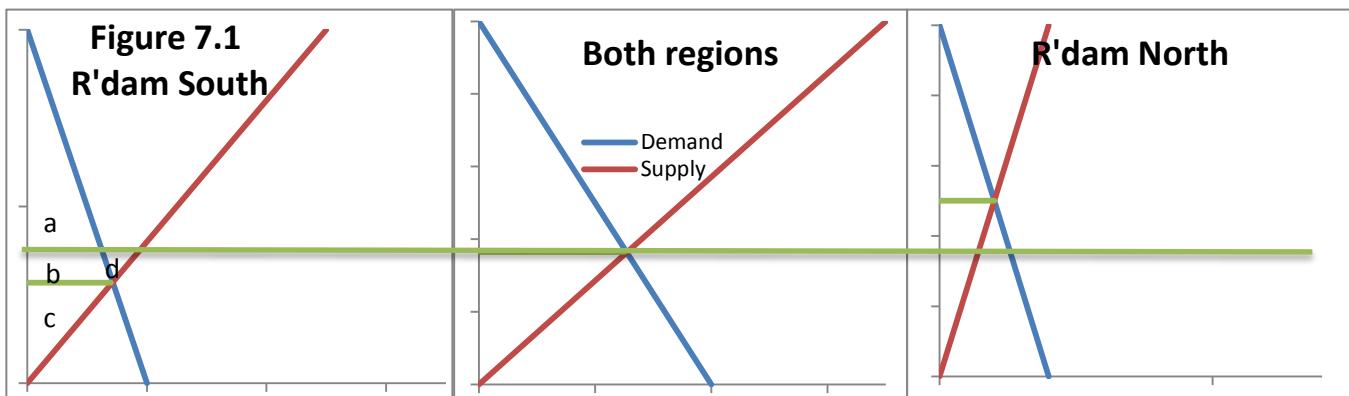
Making the informal sector exclusively for unemployed inhabitants of Rotterdam South has also a disadvantage, namely that the gains from trade may not be optimal. Assuming that there are comparative advantages and not all goods are non-tradable, higher gains from trade can be made. Figure 7.1 gives an example of one good that Rotterdam South would partly have exported to Rotterdam North. The exclusion of Rotterdam North results in a lower price for consumers in Rotterdam South (gain in consumer surplus of b), a missed producer surplus of b+d, so a deadweight loss of d. For other services/products, this effect could be opposite. Especially the informal higher-skilled workers that are quite able to operate on the formal market would gain by open borders. Although closed borders do not maximize gains from trade, this may be seen as an advantage since the welfare trap of especially those higher-skilled workers does not increase much. The more deprived low-skilled workers are protected by the 'closed borders'.

Another advantage is that those higher-skilled informal workers are not able to compete unfairly with formal activities. Given that informal activities are less/not taxed, open borders would mean unfair competition for formal companies supplying the same goods/services.

A third advantage of closed borders is that participants are obliged to participate in their own community (if they want to become active in the informal sector). This may enlarge the aggregate social gains from trade (as described in section 2.2.3.3) and so stimulate social cohesion; *local people are needed to run community groups, to engage as active citizens in their own communities* (Seyfang, 2005).

In short, a currency different from the euro makes the organized informal market exclusively for the unemployed inhabitants of Rotterdam South. A disadvantage is that the optimal material gains that would have been possible by integrating both markets, is not reached. On the other hand, the social gains and the gains for the very deprived may be larger, since workers will all operate on a local scale. In determining the optimal currency region, it is important to find a good balance between the inclusion of as many as possible unemployed and keeping the organized informal sector small in order to stimulate community building.

> Reason 1: Using another currency allows the initiators to exclude formal workers and unemployed from other areas

7.1.2 Optimal currency area

The legal tender in Rotterdam South is the euro, a currency used in all countries that are member of the Economic and Monetary Union (EMU) of the European Union (European Commission, 2013). The decision to share a currency is the result from European economic integration. But does this serve deprived subgroups? Is this the optimal currency area? The discussion about optimal currency areas is started by Robert Mundell who was interested why the area of a currency is a country. Keynes made a clear point against international money (indirectly via the Golden Standard) by explaining that the monetary policy of a country was often focused on improving the balance of trade at the costs of other countries. This mercantilist way of governing import and export valued a positive balance of trade more than combatting national unemployment.

"If there is one thing that protection cannot do, it is to cure unemployment. ... There are some arguments for protection, based upon its securing possible but improbable advantages, to which there is no simple answer. But the claim to cure unemployment involves the protectionist fallacy in its grossest and crudest form." (Keynes, 1923)

Suppose the whole world consists of two regions with the same currency that are initially in balance of payments equilibrium. Now the demand shifts away from the product produced by region A to the product produced by region B. Assume that prices and wages cannot adjust in the short run without causing unemployment and monetary authorities to prevent inflation. If the world-government has a full-employment policy the monetary authorities will combat unemployment by increasing the money supply. This will be at the costs of the inflationary pressure in region B, the surplus region. Dependent on the policy of the government (full-employment or low-inflation) or the region with most monetary and/or political power, a choice will be made between combatting inflation (no increase in money supply) or combatting unemployment (increase in money supply). It is not possible to prevent both unemployment and inflation if the same currency is used.

Therefore Mundell (1961) proposes to introduce regional currencies with floating exchange rates. The optimal currency region is: *an area within which there is factor mobility but between which there is no factor mobility*. Within regions people that lost their job can easily switch to another activity, but between regions this is not possible. If the demand focusses more towards goods of region B, laborers in region A cannot easily move to region B, but instead of inflationary pressure in B, the currency of region B will appreciate. And instead of unemployment in A, the currency of region A will depreciate. The regions can apply their own regional monetary policy.

How to interpret this in the light of the informal sector? We have a (small) region within which labour is mobile, but unemployed cannot easily move to another area. The world demand for labour has shifted away from labour of this region, so there are many unemployed. There is little trade within the region, since unemployed are not using their labour and the scarce income is preferably spent on goods from other regions (preferences). So many goods are imported from other regions (paid by unemployment benefits and subsidies) and there is very little export to other regions. Unemployment can only be combatted at the expense of inflation in the other regions that use the same currency or by declining regional prices (which will take time).

Suppose that a new currency is introduced with a floating exchange rate towards the euro. In the first place trade within the region can be facilitated by this currency. If the currency is convertible into the euro, trade with other regions can also continue despite shocks in demand. If demand shifts away from the region, the new currency depreciates and if demand for products of the region increases, the new currency appreciates. The monetary policy can be focused on the needs of the locality itself. So for specific subgroups, clustered in deprived areas in Europe (e.g. Rotterdam South) it may be desirable not to use the euro as monetary mean for (local) trade, but to use an own currency.

Reason 2: the monetary policy of the euro is focused on good economic performance of the whole EU, whereas the monetary policy of the local currency can optimize economic circumstances for immobile labour resources

7.1.3 Multiple competing currencies

If a local currency is used to specifically serve the local population (section 7.1.2), there will be user-competition between the euro and the new currency. Companies that trade with other regions would preferably be paid in euros, but households may have preferences for the stably available community currency. According to Hayek this competition improves efficiency in the money market.

In contrast to many socially oriented (anti-globalization) organizations that want to implement a community currency, Friedrich von Hayek is a neo-liberal free-market economist that wished to free up the right to create a medium of exchange. In his book 'The Denationalization of Money' (1976) he argues that the government once got the right to issue money, in the time that the first coins were made of gold and other metals. Then, the kings who had the royal power to make coins, discovered that it was not only a source of power, but also an attractive source of personal gain. The royal sovereignty and the right to issue money, later on banknotes, stayed with the government, because they had the political and technical possibilities to control paper money. The monopoly of money buttressed the power of the government. There is no competitor for the government to issue money, and that made the government lazy and unfocussed to optimal monetary policy.

Von Hayek proposes a system of free banking, in which different mercantilists introduce currency types. Not legal tender, but the proof that the bank itself is able to keep the money valuable is what such a system will bring. Parallel currencies will compete and the currency with the lowest user costs and greatest stability (yielding highest value stream of monetary services) will be preferred by actors (Klein, 1974). He mentions Gresham's law which states that under legal fixed exchange rates, bad money drives out good money, but opposite if the exchange rates are floating. Then, people want to get rid of the bad money as soon as possible, accepting the good money as repayment, so in the end the good money will survive. A condition therefore, is that the government accepts competitors on the monetary market (with floating exchange rates) or that new currencies evolve on a very local scale; so small that the government does not mind competition.

Such a small scale can be found in local communities. For community currency initiators, this message of Hayek challenges them to compete with the (inter) national monetary monopoly. Although their currencies operate on small scale and will never drive out (inter) national money, the impact within the locality may be significant; especially when the neighbourhood is deprived and the (inter) national money was not able to facilitate the use of over-capacity. If people have the choice to be paid in the community currency or not to be paid, the community currency will certainly be accepted. If the informal sector is only used in times of high unemployment, the system may collapse in better times, but if there is a group of voluntarily formal-jobless members, the community currency may serve as a stable local competitor of the (inter) national money.

Reason 3: Using a currency different from the euro challenges the initiators to compete with the euro, so it may facilitate transactions that the euro was not able to facilitate in a stable way.

7.2 Design a community currency system

By making the decision not to use the euro as monetary commodity, many decisions have to be made in order to form an appropriate system. These will be discussed in this section.

7.2.1 Currency type

The type of currency is the medium that carries the value. This medium should be scarce, require low operation costs for initiators, difficult to counterfeit, fungible, not or slowly perishable and easily transportable. There are several forms that can be used. Their scores on the requirements are displayed in table 7.1.

Table 7.1	Scarce	Low operation costs	Difficult to counterfeit	Fungible	Not/slowly perishable	Easily transportable and storable
Commodity money	v	v	v	Depends	Depends	Depends
Paper/coins money	v	Depends	Not	v	v	v
Electronic media	v	Depends	Not	v	v	Depends on access internet

Commodity money does not require an advanced social or legal infrastructure, since the money keeps its value and can eventually be consumed by the owner (if he is no longer able to exchange it for other products). A disadvantage is that it cannot always easily be produced and it may not be fungible, easily transportable and storable or it can be perishable, losing its store of value. Especially some centuries ago before the introduction of fiat currencies, this currency type was used.

Commodities used are gold (Golden Standard), salt, but later also cigarettes and, a more recent example, charcoals in Osaka, a village in Japan. (Lietaer and Hallsmith, 2006)

Banknotes and coins are a very handy and cheap currency type. It is easy to produce, so the money supply can be controlled. However, it may be sensible to counterfeit, especially if the informal economy increases in size and value. The Latin American currency systems (e.g. the Red Treqeue) but also many time banks use banknotes and coins as currency type. (Ould-Ahmed, 2010)

The currency type used in most actual alternative currency networks is a digital system of balances for each participant (Lietaer and Hallsmith, 2006). This brings along administration costs, but this administration can be used to regulate or to tax informal activities, which is one of the conditions from the first part of this study. A condition for using a digital currency is that every participant has access to a digital medium: internet, mobile phone, or that a chip system (smartcard) is used. Readers for those cards are very expensive, but they are used in some networks in Europe and Japan. There are also currency systems that use multiple currency types, taking advantages of each type.

7.2.2 Standard of value

In order to let participants start to trade within the informal sector, it is good to have a standard of value that one unit of a currency represents. Such an indicator of the value enables the *unit of account* function of money. There are three types of the standard of value:

1. Connected to legal tender: the indication of the value of one currency is equal to one unit of formal money. (1 Zuiderling=5 euro)
2. Connected to time: the indication of the value of one currency is a period that the worker should spend on offering services to the paying household. It is possible that prices are adapted to the value of the services. An informal hairdresser may ask 5 hours of work for a haircut of only half an hour. Goods can also be traded in 'service hours'. (1 Zuiderling=1/2 hour work)
3. Connected to another physical asset: A broadly adopted system in which the currency represents the value of one asset is the system of Air Miles used by air companies. Other examples are kg. of coal, Kwh or crops (1 Zuiderling=1kg of potatoes). They have in common that all participants of the informal sector consume/use them. (Lietaer and Hallsmith, 2006)

If the informal economy is more developed, the actual value of the currency may deviate from the standard of value. Its value is only guaranteed if the currency is formally convertible into the value that it represents (at a fixed exchange rate). As the quantity theory of money predicts, an increase of the money stock without a similar increase in transactions, will reduce the value of each currency-unit.

7.2.3 Store of value vs. means of payment

Silvio Gesell: demurrage
The 'store of value' of a currency may reduce the 'means of payment' function of money. Silvio Gesell is one of the economists that pointed first to this trade-off and argued that the store of value of money is harmful for economic prosperity. The main message of Gesell is that money, as it is used in a regular economy, is superior to other commodities. The value of most goods decreases over time, since storage costs and decay give incentive to sell or to use the goods as soon as possible. The value of money, however, has the characteristic to increase over time, because an interest rate is paid to the cash holder. This is because people usually have preferences for actual consumption over

future consumption. By lending your money you are paid for delaying your expenditure and giving the possibility of actual expenditure to someone else. According to Gesell this is not a good pattern:

"…if our ancestors always consumed their winter provisions before the winter began, it is difficult to account for the fact of our existence. Or did our forefathers renounce immediate enjoyment because the provisions in their cellars yielded interest, that is, became more valuable, more abundant and of better quality?" (Gesell, 1918: p.195)

Because of the superiority of money, owners of cash are able to prevent investment without bearing any costs (Gesell, 1918 and Johannssen, 1913). If a cash holder gets interesting investment opportunities he may decide to invest and not to block. However, if there are not such investment opportunities his incentive to hoard is very large. Then the government may try to correct for it by buying money (offering high fiscal interests) and spending it in the society, hoping that the economy will start again in offering interesting investment opportunities to the cash holders. Two other possibilities are (1) increasing money supply (resulting in inflation) and (2) charging demurrage.

Increasing the money supply result in inflation which may be quite unpredictable for companies and consumers. Demurrage, as it is introduced by Gesell, is a more predictable interest or tax on hoarded money. He describes demurrage as the (artificial) costs of holding money. This tax should be equal to the liquidity premium that cash holders receive. The liquidity premium is the lower limit for the interest rate. The interest rate fluctuates to high levels in times of economic growth and lower levels in times of recession[11], but the interest rate will never be below 0 in a capitalistic system. There is a lower limit to the interest rate, estimated by Keynes to be 2-2.5%. (Keynes, 1936) The existence of this limit in a capitalistic economy is caused by:

- The uncertainty that lenders face, since the actual consumption of money is more secure than the consumption of the same amount of money in the future (possibly because of inflation). (Keynes, 1936)
- The absence of storage costs and devaluation result in an absence of incentive to get rid of money (as with other goods would happen). Cash holders are only willing to get rid of money if a liquidity premium is paid. (Gesell, 1918)
- Money is a universal option; it is interchangeable for almost everything. Holding cash gives more freedom compared to holding goods. Sacrificing liquidity means a reduction in freedom, so there should be a compensation for it. (Löhr, 2010)

If the marginal productivity of capital is lower than the minimum-interest rate (liquidity premium), there will be more savings than investments (in the Keynes model). The interest, profits, rents and other asset-holder advantages stay artificially high, shifting away reward from labour income to owners of capital. This results in a crisis. However, if the government charges costs of holding cash, costs equal to the liquidity premium, there may be a positive interest in economic prosperous times, but the interest may also be 0 or negative during an economic crisis: stimulating the circulation of money.

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[11] Adjusting to the Marginal Productivity of Capital, or, as Keynes states, to the Marginal Efficiency of Capital.

Demurrage vs. increase in money supply

Besides a tool to stimulate circulation, demurrage is also a source of revenue for operation costs. This is also the case for increasing the money supply[12]. What may be reasons to use demurrage to finance operation costs and to stimulate circulation instead of increasing the money supply? There is not much scientific literature that compares these two methods, because a practical application of demurrage may be hard on national or international scale. Nevertheless the following issues may initiators let decide to charge demurrage instead of printing more money:

- Demurrage is directly visible and predictable, via a loss in each personal budget. An increase in the money supply will indirectly be visible via higher prices, so a relatively smaller budget. With demurrage, the standard of value (like time or a commodity) will not inflate which may be more convenient for participants.
- In (inter) national taxing systems, most taxes are obtained from transactions. Demurrage can be seen as a taxing system that does not give disincentive to trade, but that stimulates transactions.

Practical issues in demurrage

The reason that demurrage is not used on (inter) national scale is that it is hard to have an efficient and consistent method to charge demurrage. In existing alternative currency networks several methods to charge demurrage can be distinguished.

If banknotes and coins are used as currency type, there can be a general period on which the money has to be changed for new money at a discounted rate, for example each January. A month later, in February all money of the previous year expires. This seems very disruptive to the facilitation of efficient transactions, since probably everyone wants to earn money early in the year which slowly turns into the wish to spend in the end of the year. Prices charged in the end of the year will become much higher than prices in the beginning of the year. Nevertheless it is applied in many complementary currency systems, for example the Credito in Argentine. No disadvantages are reported (Ould-Ahmed, 2010).

If digital accounts are used as currency type, demurrage may be much easier. It can be levied:
- comparable to the method used with banknotes: one or two times a year all balances devaluate with a certain percentage. The same mechanisms will appear as described above.
- on the average value of a balance during a year (like the interest rate is credited to formal bank accounts). Comparable to taxes on capital that are charged by many national governments.
- if a participants holds more money than a certain hoarding threshold. This threshold may, for example, be the average money availability per participant. In this case holding money is not punished, but a disincentive is given to having 'more than average' money. As far as I know, this method is not practiced in an alternative currency system yet. In this case the revenue for the initiators may vary per period.

Several problems may arise. First the *store of value* is in danger. Saving money to buy an expensive good or to provide certainty for the future has become more expensive. This objection, however, can (partly) be rejected in the context of a local currency. The main aim of the informal economy is to facilitate the use of over-capacity in the formal economy. The store of value of money is of less importance, since participation is a short time solution to use over-capacity, so earnings will possibly also be spent quickly.

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[12] Although on (inter)national the government is not directly able to spend the increase in money supply issued by the central bank.

On the informal market of money informal lending and borrowing among households is possible, but once the initiators start to give out loans at a negative interest there will be huge inflation. Then no one wants to earn money, but only wants to spend money. The initiators should not provide loans at a negative interest rate. If they want to lend small start-budget for new participants, there should be no or a small positive interest rate to stimulate spending.

Other options: no or a positive interest rate
Instead of a negative interest rate, community currencies often work without interest. There are a few community currency systems in which they work with positive interest rates for savers and negative interest rates for borrowers. The reason why most systems do not use a positive interest rate is that '*Its disadvantage is that it implies a systematic money transfer from people who don't have money to those who do, so that it tends to concentrate wealth. In contrast, demurrage-charged currencies provide an incentive to circulate the currency as opposed to accumulate it.*' (Lietaer and Hallsmith, 2006). The optimal choice, a negative, no or a positive interest rate depends on the local context and the purpose of the currency system.

7.2.4 Creation costs vs. credibility
As there is a trade-off between the store of value and the medium of exchange functions of money there is also a trade-off between the ease to create a currency and the effort to maintain its credibility (Lietaer and Hallsmith, 2006). What are the options in guaranteeing the value of the newly created currency? Five different options can be distinguished. They vary from a fully convertible currency that has full credibility but which is very difficult and expensive to create to a central distribution system that easily gives out money to participants, but has to work a lot on its credibility.

- Fully convertible currency (Guilder under the Golden Standard)
- Convertible under conditions (C3, spendlocal.org)
- Not convertible, but legal value guaranteed (Iris Cheque, Air Miles)
- Mutual credit system (LETS)
- Central distribution system (Credito)
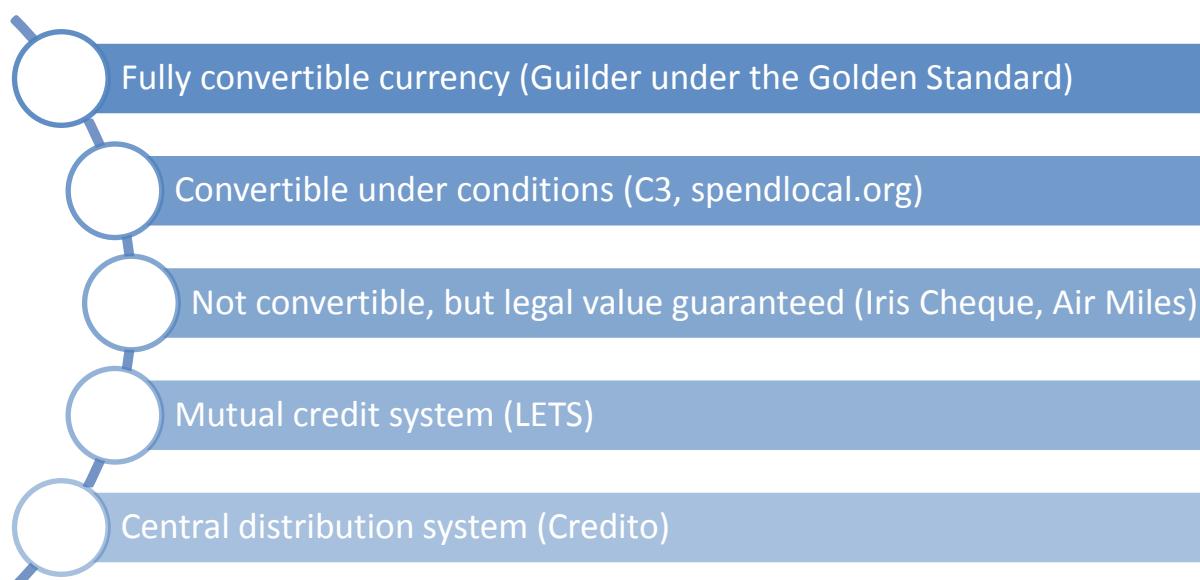
Options in issuing procedures
A convertible currency is one that may be freely exchanged for foreign currencies (Krugman & Obstfeld, 2006). Defined in the context of community currencies, a convertible currency may freely be exchanged to one prearranged good/commodity/currency at the office of the initiators. There are not many complementary currency systems that offer full convertibility, since the costs to keep reserves of the commodity/currency are very high. Full convertibility may be promised under a floating or a fixed exchange rate. Especially a fixed exchange rate would require huge reserves, since the value of the currency will depreciate once many people claim their right of full convertibility.

The second option is to make the currency convertible under certain conditions. Within C3 for example (Lietaer, 2011), it is possible to convert the currency into formal money at the costs of the formal interest. Other examples are convertibility by auctions (a limited amount of money can be converted by the highest bidder) or convertibility after an expiration period. If these costs and conditions are transparent, the value of the currency is guaranteed.

As a third group there are many vouchers and cheques that have legal value, but are not convertible into a commodity or another currency. Their credibility is based on the reputation of the business that issued them. A community currency issued by an already existing company may have a large credibility, but mostly initiators start to issue a community currency independently from an already existing company.

Fourth there are Mutual Credit Systems (MCS). In an MCS members are able to buy services and goods without having money. The moment of the transaction, money is created in debt by the receiver of the product and as positive amount on the account of the supplier of the product. This is registered in balances and each member has the task not to have too much debt or surplus. So instead of the credibility of the initiators, the credibility of the other participants of the network (the trade partners) determines the credibility of the currency. In order to let MCSs work there should be mutual trust which is especially found in small communities (up to 50 members) or in specific business branches that can be forced not to free-ride via the legal system.

As last group there are currencies that are just distributed. The credibility of the currency is dependent on the capacities of the initiators to stabilize the currency's value. This is the easiest way to create a currency, but the hardest way to guarantee its credibility. If the money supply/activities ratio is not precisely controlled, there is a risk of depreciation and a loss of credibility.

Convertibility and its consequences for interactions with the formal market
If the initiators choose the informal currency to be convertible or to be conditionally convertible and if the exchange rate is floating, there will be 'free' trade between the informal and the formal sector (if there are no other trade restrictions). As theoretically predicted when borders are opened for trade, there will be losers and winners, but there is a net increase in the gains from trade. In the end there will either be unfair competition for formal businesses giving incentive to shift activities to the informal sector (especially considering non-tradables) or similarity of regulations, making informal sector participation impossible for most deprived households. The workers that are able to make profit despite formal competition are, of all unemployed, most able to take a formal job.

On the other hand, if the initiators decide the currency not to be convertible, trade between the informal and the formal sector will only appear in barter (bilateral trade) or via currency-transactions on the 'black market'. Households may individually act as broker, supplying informal goods/services or the community currency to excluded households or businesses in exchange for euros or formal goods. Although trade between the formal and the informal sector is possible, it will be more costly. Therefore, the formal and the informal economy will be more separated, also having different equilibrium prices, as described in chapter 4.

If a national government decides to let its currency be inconvertible, it is usually because there are not enough reserves of other currencies to guarantee the value of the national currency. Convertibility is expensive. Besides that reason, the informal sector initiators may have another reason to let the currency be inconvertible. Without convertibility there is only little interaction with

the formal sector: low-skilled unemployed face only indirect competition of specialized formal businesses and high-skilled unemployed are not able to make huge gains from trade since the 'borders' to the formal market are closed. So keeping the currency inconvertible results in a smaller welfare trap (compared to a convertible currency) for especially those that are able to participate in a formal job. Moreover, formal businesses are not tempted to shift activities to the informal sector and the social gains may be larger (see section 7.1.1).

7.3 Conclusion

What type of money to use in Rotterdam South? The conditions that need to be fulfilled in order to let the organization of the informal economy be socially useful are mentioned in table 5.1. The conditions to which a currency system can contribute are displayed and numbered in the second column.

Currency type

Regarding the currency type, the digital accounts are optimal since almost all inhabitants have access to an internet or a mobile phone connection (Manders & Kromwijk, 2013) and it minimizes the costs to hold, distribute and issue a currency (condition 1). Another main advantage of using digital accounts is that it requires administration of each transaction. In this way an oversight of informal sector earnings can easily be attained by the government, the initiators and the informal workers themselves. If then a transaction is made, a short form about the type of activity and the sum of money to be transferred should be entered and (digitally) signed by both parties. If these forms are entered well, transactions can be taxed (condition 5), unemployment benefits can be reduced (condition 4) and spot checks can control services/goods that are subject to security/safety regulations (condition 5). Spot checks will also be helpful in preventing people to lie on the forms.

> BV De Zuiderling chose to use digital accounts and to combine it with banknotes that stresses the value of having a community currency by its physical appearance. It will be less efficient and more expensive to trade with banknotes, so transactions will be done with digital transfers.

Standard of value

Regarding the standard of value, connection to the euro has familiarity as advantage, but this is by the initiators considered as disadvantage. The informal economy may be created to value services/goods that did not get value in the formal economy. Are needy people willing to pay a salary in 'familiar money' for volunteering work? The psychological effect of equalizing the new currency to the euro may contradict the social aim of the informal economy. Moreover it may be hard to guarantee the credibility of the currency without having huge expensive reserves. Connection to a physical asset is feasible if there is a product that is much consumed and produced in Rotterdam South. Instead of one typical asset, a similarity of all households is that they have a surplus of time. Therefore a time-based standard of value may be most optimal for Rotterdam South.

> De Zuiderling will be a currency with time as standard of value. One Zuiderling equals ½ hour of work. In order to estimate the value of the informal market and to report its turnover in euros, the value of ½ hour work is set to €5.

Store of value

Regarding the interest rate, demurrage may be a good way to earn structural income flows without bringing down the number of transactions (condition 3). Another advantage is that circulation is

stimulated, so that some transaction costs (e.g. of searching for a job) are lowered (condition 1). However, to have a positive balance results in costs (not condition 1) and a lack of the store of value may discourage investments that allow economies of scale (not condition 2). Demurrage is preferably smoothed over time, so that prices are not too much influenced by the devaluation of money.

> BV De Zuiderling choose to charge demurrage twice a year on all the digital accounts. Each June and December, the value in Zuiderling decreases with 10%. This will stimulate circulation, but also result in seasonal price instability since people want to get rid of Zuiderlingen just before the devaluation, so prices may increase. It is not clear how demurrage is applied on banknotes.

Degree of convertibility

Regarding the degree of convertibility, it is strange to make the currency directly convertible into its standard of value: time (except if the initiators always stand ready to work for participants). Therefore, in this context convertibility is meant to be convertibility of the Zuiderling into the euro, possibly with a floating exchange rate. This would open trade borders with the formal market and so maximize gains from trade. This is especially an advantage for workers or small companies that have enough skills/capacities to operate on the formal market, since it would allow them to operate on the informal market with a better taxing and regulation climate, but without losing their trade relations on the formal market. For the poor inhabitants in Rotterdam South it is important that currency creation is cheap (or there should be large external funds). Convertibility or conditional convertibility would be very expensive since participants should pay (a part of) the reserves in euros, which reduce the fulfillment of condition 1 (low transaction costs).

> BV De Zuiderling choose to issue an inconvertible currency. The initiators do not have a business with a reputation that assists the credibility of the currency and Rotterdam South is too large to choose for a Mutual Credit System, so the Zuiderling will be issued by a central distribution system.

Concluding: the optimal currency-design for Rotterdam South is money (mainly) on digital accounts, with time as standard of value, uses charging demurrage as instrument to generate funds and is issued by a central distribution system. As mentioned, the weakness of a central distribution system is that the currency is very vulnerable for a lack of credibility. A good policy of the initiators is necessary to guarantee stability of its value. This will be discussed in the next chapter.

8. Stability of the currency

8.1 Introduction

Credibility is *the quality of being convincing or believable* (Oxford Dictionaries, 2013). After the collapse of the Soviet Union, many former command-oriented economies had to be transformed into market-economies. One of the important issues that needed to be transformed was their monetary policy. The IMF provided three criteria for a credible monetary policy: transparency (the rules are clear), competence (the government is able to stick to the rules) and creditor protection (the aim of the rules is the greatest possible price stability). (Hoffman & Sell, 1993)

Price stability is very important for the functioning of a currency. Since initiators may have less oversight and power than a Central Bank usually does, there is a high risk for inflation or deflation. The Credito in Argentine suffered from hyperinflation (Ould-Ahmed) and the Bitcoin suffers from hyper deflation (Weisenthal, 2013). A very classical example of a specific type of complementary currency that faced both inflation and deflation is the babysitting co-op, used by Krugman to illustrate the liquidity trap (Krugman, 1998). This chapter discusses two sources of fluctuation and instruments that can be used to stabilize the currency's value. The main question is 'Which instruments do the initiators have to guarantee a stable value of the currency?'. It is assumed that for the small informal economy the initiators fulfil the roles of government (public finance and fiscal policy) and the only (central) bank (money creation). Therefore instruments are not only used as money stabilizer, but also to generate revenues to cover operational costs.

8.2 Why the credibility of the currency may be in danger

8.2.1 Fluctuations related to expectations

In the example used by Krugman (1998) a group of about 150 parents agreed to babysit for one another. They printed scripts, each with the value of 30 minutes babysitting. Each participating family got 20 scripts and had to hand in 20 scripts at the exit of the cooperation. When the project just started, very few transactions were made. There were many families willing to babysit, but very few families wanted to spend their scripts, because they were afraid of running out of scripts at the time that the scripts were really useful; for example during the summer. Especially when families found out that it was hard to earn scripts, they stopped spending scripts: there was a recession. The organization decided to bring more scripts in the circulation, offering 30 scripts to new members and asking them to return 20 scripts at the exit. As a result many people expected the value of the script in the future to be lower, so many families wanted to buy babysitting services. However, there were very few families that wanted to babysit: the value of the scripts inflated.

In the babysitting co-op the value of one script was strictly set equal to ½ hour, which is different for most community currencies. Transactions can also take place for lower (or higher) prices, so they will not decrease that suddenly. However, expectations may be a source for fluctuation in the currency's value. This may be related to seasons (if, for example, most households prefer services to be done during the summer holiday) or a short time before demurrage is charged.

8.2.2 Fluctuations related to in and outflow of labourers

Besides fluctuation related to expectations, there will also be fluctuation from in- and outflows of laborers. Given that a guideline is that the value of one Z equals ½ hour, the velocity is estimated to be 5 (for simplicity not dependent on expectations) and there are approximately 250 labour hours

available[13], a simple calculation provides the necessary money supply. Given that in the long run M*V=P*T; M*5=0.5*250, so M=25. (Basic situation displayed in Figure 8.1)

The reason for price fluctuations is not so much that the informal economy deviates from its equilibrium, but that the equilibrium of the informal economy changes per period. If the formal economy is in a recession, there will be more unemployed people, so more people will become active on the informal market (increase in T). If the formal economy recovers there will be many exits from the informal market. If, during these fluctuations in labour supply, the money supply and the velocity are stable, prices will fluctuate

Figure 8.1: Relation between T and P with M=25 and V=5

$$P = \frac{5 * 25}{T}$$

dramatically (see Figure 8.1). The monetary policy should be focused on a stable value of money, so a money supply that fluctuates with the available resources. In this way the informal economy has a countercyclical effect on the formal economy.
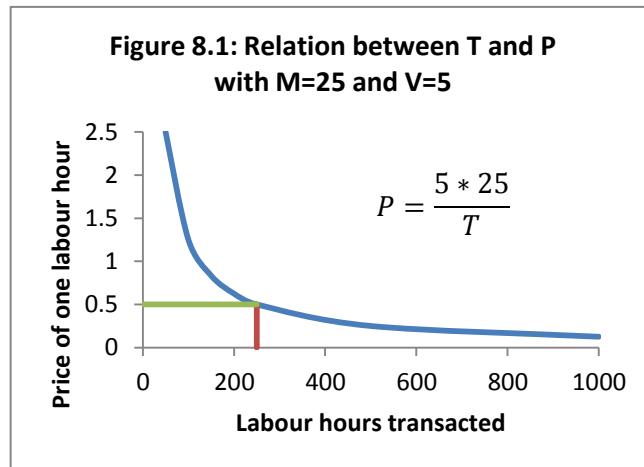
8.3 Instruments that the initiators can use to influence money supply

8.3.1 Make use of market entry and exit

In most complementary currency networks issued by a central distribution system, new money enters by the entry of new participants, like each new participating family got 20 scripts in the baby-sitting co-op. The advantage of this is that T depends highly on the number of participants, so a change in M smooths the effect of an increase of T on P. During a formal recession, more workers will enter the informal economy, so more money needs to be created. There are several options to give out start-budget: give it for free, lend it, let the new participant buy informal money with formal money or offer the new participant an informal job at the office or a charity organization to get his first salary.

Besides increasing the money stock by market entry, there should also be ways to reduce the money stock if workers stop being active. The easiest case is when the start-capital was lent to the participants. The moment they stop being active may be determined to be the moment they have to repay the loan. If participants paid euros for their start-budget in informal money, this start-budget can be made conditionally convertible into the euro by market exit. It is important that once workers stop supplying labour informally, the money they brought in should be subtracted from the money supply, since they contribute no longer to T. Methods to withdraw money from the informal market by market exit are surprisingly not discussed in literature about community currencies (except for the babysitting co-op). A reason for this may be that most networks grow and that the number of active members stabilizes.

8.3.2 Job creation within the organization or charities

There are many examples of complementary currency networks in which charities and the organization itself run on informal workers. These 'fiscal policies' are a way to bring more money in the informal economy. In some currency systems charities are seen as actors that have to break even

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[13] The velocity and the availability of labour hours should be estimated by the outcomes of small pilots before the system is applied on a large scale.

(Seyfang, 2002). A food bank, for example, may charge informal money for food parcels and pay the informal workers that run the food bank. For other charities, however, the target group may not be able to work informally (heavily handicapped or deprived) so those charities can be helped by money flows. Using charities is an easy way to create informal jobs.

Job creation in this way is again a tool to bring more money into circulation. The reduction of jobs stops these money inflows, but there is no way to withdraw money from the informal economy by this instrument. This instrument can only be used to prevent deflation of the currency.

8.3.3 Taxes and fees

The other side of the 'fiscal policy' of a government is to levy taxes. Taxes can be levied as a fee on membership, capital (demurrage, see section 8.3.4) but also on each informal transaction. In contrast to a fee on membership, a tax on transactions may discourage trade, but it lays the burden on the people that make most use of the informal market. The tax on transactions may be flat (a fixed tax for each transaction) or a percentage of the sum paid in the transaction. These taxes can be subtracted every month from the bank accounts of the participants. Changing the tax level is a way to reduce or to increase money supply. It is important that the tax level does not fluctuate too much. If shifts are necessary, they should be transparent and predictable, so that the effect of expectations is minimized.

8.3.4 Demurrage/interest rate

Capital holding may be rewarded or be 'punished'. A positive interest rate may be used as instrument to influence the value of money. If the initiators do not lend to participants, there should be another source of revenue to pay the interest rate of cash holders.

As discussed in 7.2.3, demurrage may be an instrument to withdraw money from the informal economy. It serves as source of revenue (tax on capital) but also as a way to influence the stability of money. Incentives are given to participants that hoard and it is a source of revenue that does not reduce the incentive to make transactions (as taxes on transactions do). Varying the negative interest rate is a way to stabilize the value of a currency. However, this cannot be done without any limits. It is important that the negative interest rate is as constant as possible and that the (small) shifts that are necessary, are predictable and transparent. Most complementary currency systems that work with demurrage have a fixed negative interest rate or change them yearly.

8.4 Conclusion

The instruments that the initiators can use to stabilize the value of money are displayed in Figure 8.2. There are various administration- and software types to organize money supply and administrations of transactions efficiently. STRO is one of the organizations that design methods to govern a complementary currency (Arkel et al., 2013). These systems need to be designed for the specific situation: the size, the type of actors that will participate, the goods/services that will be traded etc.

Figure 8.2

Reduces value of currency (M↑)
new money by market entry
job creation in organization or charity
reduction of taxes/fees
reduce demurrage/increase interest rate

Increases value of currency (M↓)
loan repayment by market exit
increase taxes/fees
increase demurrage/ decrease interest rate
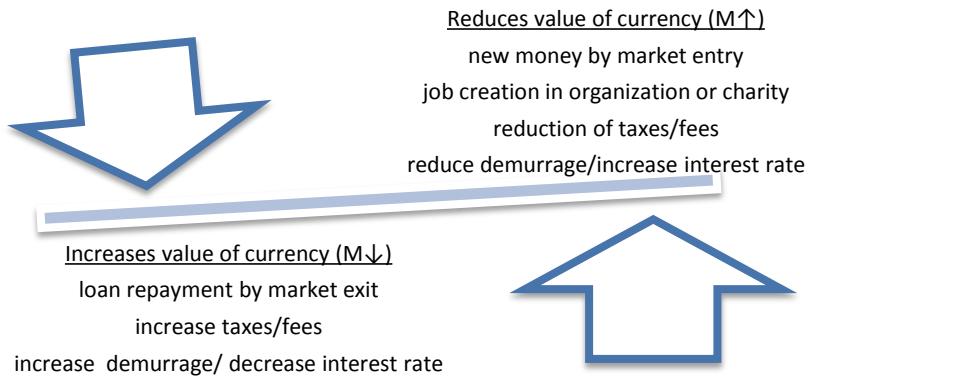
Such a system also needs to be designed for Rotterdam South. Thereby these general advises can be taken into account:

- If there are vast fluctuations in the number of active members, lending money by entry and requiring repayment by exit is a very useful tool to keep money supply in control.
- The other fluctuations in the value of the Zuiderling, resulting from expectations and seasonal preferences can be combatted by using the other instruments. The instruments that withdraw money from the circulation should be used with care because uncertainty may enlarge fluctuations by creating wrong expectations. Not using all available instruments may result in greater transparency.

> BV De Zuiderling does not mention its way to deal with price fluctuations. In the business plan it is expected that the number of activities and the money supply both seem to increase gradually for the coming 5 years. Experience will show whether the instruments mentioned are necessary.

9. Summary and discussion

This chapter will give a summarized answer on the main question of this research '*Under which conditions and in which monetary form is the organized informal market a socially useful intervention?*', followed by a discussion about the social use of the organized informal market and further areas that need to be researched.

9.1 Summary

9.1.1 Under which conditions is the introduction of an organized informal market a socially useful intervention?

In general, the introduction of an organized informal market is socially useful if it increases social welfare. Gains are made by the use of over-capacity and by the creation of utility from social interactions, but these gains should not be exceeded by the social costs of unjustified unemployment benefit consumption and tax evasion. In order to reach this, six conditions need to be met:

It is possible to increase social welfare if gains from trade can be made additional to activities in the formal economy and additional to the informal trade relations that already exist by coincidence or by habit. If gains from trade can be made, the organized informal market is viable. This is the case if there are (1) net gains from trade for at least two households. Further it is important that there is (2) overlap among households in the type goods and services produced and consumed, (3) the household should do something in household production of tradable goods/services (instead of using time for non-tradable production and leisure only) and (4) there should be structural funds to provide the operation costs. These funds can be subtracted from the participants (then the net gains from trade should be even higher) or there may be external funds like subsidies or donations.

If then the informal market is viable, it is important that the social costs are not exceeded by the social losses from unjustified unemployment benefit consumption and tax evasion. The informal market should preferably offer jobs to people not able to have a formal job: retired people, incapacitated and temporary to unemployed workers. To let unemployed participate in informal jobs has a positive effect: deprived persons get skills and their work ethic may shift. However, once a formal job is offered to an unemployed person that is able to have a formal job, he should be motivated to take it. This is difficult to realize, since his welfare trap increases by participation in the informal sector. Therefore, (5) a reduction in the unemployment benefit as a result of informal sector activity should be feasible.

As the informal sector can disturb the formal labour market, it may also disturb the market for goods and services. Formal suppliers of inputs and complementary goods/services gain and formal suppliers of substitute goods/services may lose (if their product is relatively more expensive). This competition may be considered as unfair since informal activities are not taxed and regulated. It may even give incentive to formal workers to switch to the informal economy. Therefore (6) it should be possible to levy taxes and to apply regulations on informal activities. How these regulations should look like depends on the size, government requirements and other contextual variables.

Those six conditions should be fulfilled in order to make the introduction of the organized informal sector socially useful.

9.1.2 How and in which form can a local currency system contribute to the facilitation of the conditions found in the real part?

The conditions found in the first part, can be grouped in (1) conditions that need to be fulfilled by characteristics of inhabitants of Rotterdam South and (2) conditions to which a complementary currency system can contribute. A complementary currency system includes all general issues in the creation, administration and management of a currency.

Money, in general, eases transactions. If transactions are done by barter there should be double coincidence of wants, it would be very difficult to buy expensive products or to delay expenses (difficulties in saving and borrowing). Therefore, the use of a monetary commodity contributes to gains from trade via a reduction in transaction costs.

The challenge is to choose an appropriate monetary commodity that is able to contribute to the facilitation of the conditions found in the real part. Dimensions in which decisions have to be made are: euro vs. new currency, type of currency, standard of value, store of value and convertibility. The optimal currency-design for Rotterdam South is: (1) monetary commodity differs from the euro, (2) money is created on digital accounts, (3) time is the standard of value, (4) demurrage is charged as instrument to generate funds and to stimulate circulation and (5) the currency is issued by a central distribution system. These are also the choices made by the initiators, BV De Zuiderling. Because they choose to issue the currency by a central distribution system, it will be a challenge to guarantee credibility and stability of the Zuiderling.

Two sources of fluctuation can be distinguished: expectations and in- and outflow of laborers. The instruments that can be used to stabilize the value are (1) issue money by market entry and subtract money by market exit, (2) taxation and fees, (3) interest rate, (4) job creation in the own organization or a charity. To prevent large fluctuations from expectations, transparency and predictability of the use of these instruments are very important.

9.2 Discussion

In the first best world, all individuals capable of having a formal job would have a formal job. The retired and incapacitated people would possibly trade non-tradables together with an own currency. However, the first best world is not reality. In reality there is much non-used and underused labour capacity, and the bad of non-used labour capacity can only be combated by the side-effect of other bads: unfair competition for formal sector producers and an increase of the welfare trap.

This study has reviewed these aspects in a mainstream economic theoretical way. The concept social usefulness is introduced, implying that the social and material gains from the organization of the informal market may exceed the social losses from unjustified unemployment benefit consumption and tax evasion. By organizing the informal market combined with rules and taxes, those bads can be minimized. Whether the minimized bads plus all social and material gains outweigh the situation with labour over-capacity is in reality more a political question than an economic question. Furthermore, its impact should be compared with the impact of other interventions that combat poverty by using over-capacity of unemployed.

If then the conditions for a socially useful informal sector are formed, many questions arise on the facilitation of these conditions. I decided to focus more specifically on the monetary side of this small economy. By choosing for the monetary aspects, I skipped other important questions, such as the design of the initiator group (BV De Zuiderling), the regulation and taxation system and information mechanisms. These aspects also have a very large role in fulfilling the conditions for a socially useful

informal market. Further research could certainly contribute to this subject by studying these questions.

The aim of this thesis is to provide an economic view on the concept local economies and local currencies. Literature about local currencies often makes assumptions that are seen as fallacies by mainstream economists. One of those fallacies is that there is a lack of money which can be solved by printing money. Economists rather see it as a lack of (local) income. Printing money is no solution, since it will only result in an increase of the price level. Another fallacy is that international trade exploits poor people. This may happen if there is market failure, for example information asymmetry, but free trade in itself does not lower the income of poor people; it increases gains from trade. By these fallacies in the community currency literature, most economists are skeptical about creating an alternative currency. In economics it is a quite under-researched concept.

With this thesis I tried to open the economic discussion, to look at the concept of local currencies as an innovative and, in some cases, efficient way to deal with over-capacity and to combat poverty. Further theoretical economic research can contribute to this discussion by developing a model and more precisely determine 'socially useful intervention' and gains and losses for unemployed and the formal economy. However, it would be most helpful for the discussion if proper impact evaluation of already existing local currencies would be conducted. Instead of qualitative case studies that mention some advantages and disadvantages, quantitative insight in the value of transactions, cash flows and replacement of the formal economy will be a good next step in research into the social usefulness of local currencies.

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