RESEARCH REPORT

Report prepared for the City of London Corporation, ESRC and Recipco
by Z/Yen
Published December 2011

Capacity Trade and Credit: Emerging Architectures for Commerce and Money

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Foreword

Stuart Fraser
Chairman, Policy and Resources Committee
City of London

This report contributes significantly to our understanding of the new and innovative trading mechanisms and technologies operating through non-monetary capacity exchanges that in the last few years have become a prominent feature of the global trade picture. It explores the potential for the development of such a capacity exchange based in London, and the regulatory structure which would be needed to support it.

The UK depends on world trade. We are a relatively small country with a long history of responding quickly to the competitive challenges of new technologies and forms of commerce. In a fast-changing world, now more than ever our future depends on meeting these challenges. Historically, radical innovations in industrial technology have improved human welfare. 'Creative destruction' through disruptive innovations, such as the steamship, the train, the telephone, or the power grid, have often subverted previously dominant economic interests. Innovations succeed because of their real benefits to people, through access to better and more reliable services and products, delivered to the locations where they are wanted. Less visible, but no less important, have been successful innovations in the form of the joint stock company, exchanges that efficiently deliver global trading and in the banking and credit infrastructure.

This report examines the continuing evolution of forms of exchange outside the conventional financial system. We are all aware of the shortcomings of conventional finance, so it shouldn't surprise many to learn that the business world has continued to develop alternatives for some time. Both the general concept and the practical implementation of bilateral and multi-lateral barter and 'non-monetary' exchange are not, in fact, new, but what may surprise people is to know how large a share of world trade takes place in non-monetary terms, more than 20% by some accounts, especially in the form of countertrade.

The growing volume of direct barter and countertrade reduces conventional financial requirements – a direct benefit to producers and consumers of real goods and services. Besides this there has been a great interest in developing limited use and alternative currencies to facilitate trade. New technologies allow low cost global market access to multiple trades, without using a standard or sovereign currency and at very low transaction costs. The latest technologies open up the potential for significant gains in productive efficiencies by large and small firms trading globally in business to business supply chains, but also in those running from business to government and business to consumers.

Indeed the report notes that the use of specialized money or 'common tender' for transactions - a currency unit that is not controlled through a central bank or sovereign government - has been around from the earliest recorded times. Trading and the provision of credit between individuals and organisations who otherwise do not know each other personally has been transformed over time through the

evolution of business and trading infrastructures, developed by competing private enterprises. Such infrastructure needs to provide confidence that deals agreed and contracts made will be honoured and delivery made in a secure exchange using an acceptable trade unit.

What is new in this study is the judgment that the role of common tender in the exchange, credit and clearing processes could become very significant. Common tenders need a solid basis for confidence – confidence that in conventional finance is provided by a central bank-backed and sovereign currency. Trust and confidence in a medium of exchange can be built on private sector foundations too, by bringing together the right firms in the right structure. Confidence and trust could be provided by organizing an issuing entity, managing the exchange, that has a strong level of backing by reputable exchange members. There would be scope too for an approach to regulation and governance that would seek to reflect a global approach to the social function of trade – as a mechanism which encourages international development, growing prosperity and access to the world economy.

Innovative capacity exchanges with common tender have particular relevance now as we face a weak economic recovery and widespread constraints on the flow of credit to SMEs, in that they have the potential to ease counter-cyclically the liquidity problems facing businesses coming out of recession. But while the advantages may be highlighted in a downturn, reducing the need for traditional financing saves money and makes sense at any time for businesses, large or small.
Helping businesses to trade more efficiently and to depend less on traditional financial credit is one of the exciting potential benefits from such exchanges, as well as helping companies gain better access to external supply chains and encouraging more effective utilisation of capital. There is also a challenge and an opportunity for government: to welcome such innovations, to foster them and to help ensure that they reinforce Britain's place in global trade.

Stuart Fraser
London
December 2011

Foreword

Andrew Levi
Managing Director – Business at UK Trade & Investment

I welcome this report which highlights an exciting opportunity for companies to potentially create value from untapped capacity. The report sets out how a capacity exchange could act as a major stimulus to both domestic and international trade, something of great interest to all in Government and business seeking to promote sustainable growth and prosperity.

Countertrade and barter accounts for a significant and growing percentage of global trade worth over US$ 100bn and accepted by over 100 countries as a form of commerce. London is at the heart of global financial services. It has the right talent and the right regulatory and business environment to ensure that high quality, value-creating innovation of the sort which an international capacity exchange could represent, has the best opportunity to succeed. The United Kingdom, more widely, is independently rated the most attractive investment location in Europe and is consistently ranked second or third in the world for stock of foreign direct investment.

I extend my congratulations to The City of London, the Economic and Social Research Council, Recipco and Z/Yen for their collaboration in producing this excellent and timely report.

Andrew Levi
London
December 2011

Abstract

This report explores the feasibility and benefits of establishing a capacity exchange or hub of capacity exchanges in the UK. The research team interviewed professionals from a variety of sectors, surveyed existing multilateral reciprocal trade exchanges and conducted desk research into the concepts of capacity, trade, credit and money, including alternative forms of money to sovereign currency. In order to explore the role of common tender in multilateral reciprocal trade, the research also simulated a capacity exchange with varying common tender and sovereign currency ratios.

The research concluded that capacity exchanges are clearly at an early stage of development, with diversity in approaches, participants, industries and scale. Multilateral reciprocal trade using common tender is an emerging sector with the potential to create complementary credit systems alongside traditional financial credit that should increase trade and economic growth, as well as wider social benefits. Such potential is tied to the trust participants place in the exchange model and the common tender, as well as levels of liquidity. A clearer, more solid regulatory framework might encourage more rapid development. The report identifies further data collection and academic research that would support future decisions on policies related to capacity exchanges.

1. Executive Summary

1.1 Capacity exchange – concept

Commerce underpins economic growth, advances socio-economic wellbeing and fosters mutual interests. The majority of business-to-business (B2B) trade uses money in the form of sovereign currencies, yet companies and governments also conduct trade on a bilateral, reciprocal basis by exchanging goods for goods without money. Such transactions are commonly known as 'barter' or 'non-monetary trade' and are widely regarded as less efficient than monetary trade since they require a coincidence of wants and needs between counterparties at one point in time, and are often contractually more complex.

Reciprocal trade is made possible on a *multilateral* basis by allowing counterparties to defer 'payment' for goods and services through a mutual credit system – i.e. a form of money – that is redeemable only in other goods and services and not in sovereign currency. Such money might be referred to as 'common tender' – a means of exchange that is widely accepted without legal coercion. Mutual credit brings participants back to the multilateral network to redeem their common tender since it is typically not redeemable for cash.

Multilateral reciprocal trade using common tender is not new, but information technology is transforming its ease, familiarity and potential to develop at scale. Multilateral reciprocal trade is more common among SMEs in local or national trading networks than internationally or among multinationals. Where larger government and multinational organisations engage in multilateral reciprocal trade, they have tended to focus on using spare capacity, such as excess media space. Recently, some larger multilateral reciprocal trade systems have become more prominent. Some interesting propositions for multilateral reciprocal trade using newer forms of common tender have also been more widely publicised.

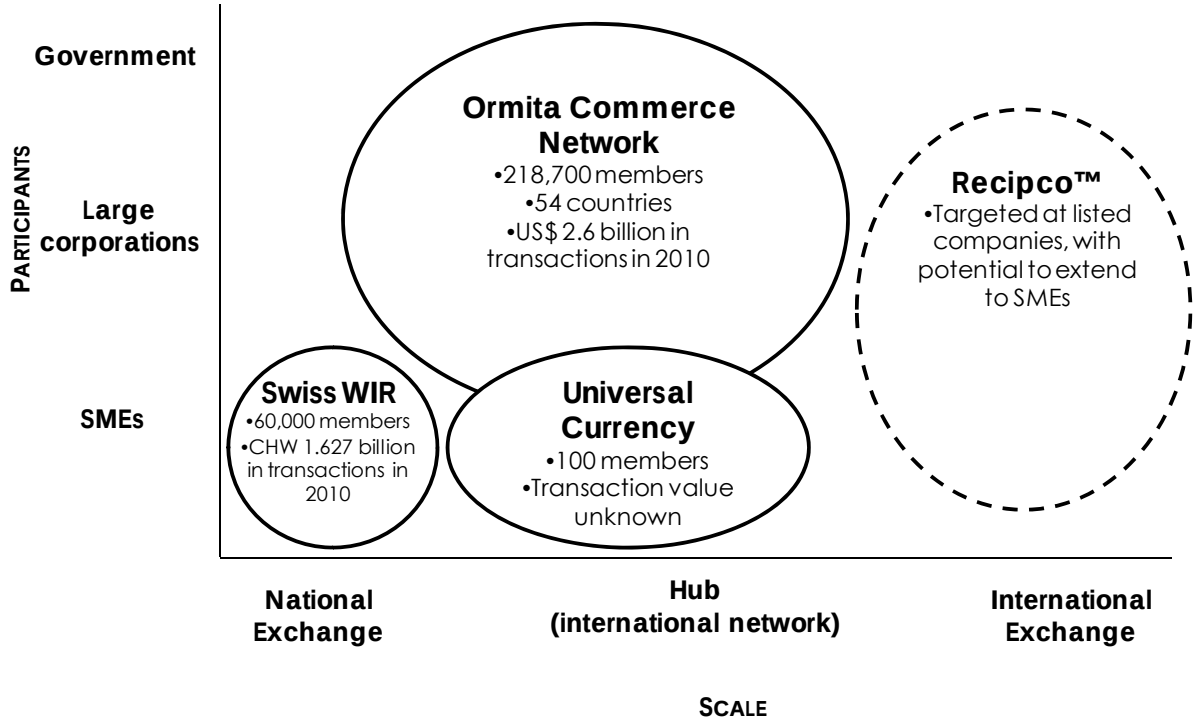
This report defines "capacity exchanges" as "*membership-based systems within which companies can trade available capacity in the form of goods, services and infrastructure within and across industries, using common tender as a medium of exchange*". This report explores four fundamental concepts of multilateral reciprocal trade and capacity exchanges – capacity, trade, credit and money. This exploration is followed by examples of contemporary practices in multilateral reciprocal trade using common tender, as well as some emerging innovations. Finally this report assesses the implications and benefits of a global capacity exchange hub in the UK.

1.2 Capacity Exchange – context

Recent financial crises have affected economic output, trade and finance, and thus incomes, jobs and purchasing power. Financial crises lead people to explore new monetary systems, community exchange networks and alternative currencies. Well known historical examples include John Maynard Keynes' *Bancor* suggestion after World War II, and the issuance of around 400 scrip currencies in the aftermath of the Great Depression in the United States. Local community exchange initiatives include the British Local Exchange Trading Systems (LETS – see Appendix 17), the French SEL (système d'échange local) and the Argentinean Global Trading Network of 'barter clubs'.

Businesses often have excess capacity in their own goods, services or infrastructure, even more so when the financial cycle slows and credit tightens. Business people find that using capacity to source needed goods and services is an attractive alternative proposition to conventional sales and credit if it can increase sales, ease cash flow or reduce reliance on conventional credit. In order to illustrate the landscape of multilateral reciprocal trade using common tender, Figure 1.1 sketches the participants and scale of three existing systems and one proposed system. The Swiss WIR is an extensive national SME system founded in 1934; the Ormita Commerce Network is a barter network founded in 2007; Universal Currency is a mechanism created in 1997 using a common tender across a network of circa 100 local exchanges; and Recipco™[2] is a proposal for a capacity exchange focused on listed multinational companies with a mutual credit system backed by the members.

Figure 1.1 – Multilateral reciprocal trading landscape



1.3 Concepts: theories and developments

1.3.1 Capacity

Proponents of multilateral reciprocal trade claim that it leads to more efficient use of capacity at both company and country levels than is currently being achieved through standard methods of trading and traditional finance. Capacity utilisation at a macroeconomic level is difficult to measure comprehensively but existing indicators suggest that both developed and developing countries experience significant 'slack' in their economies which could be reduced by better capacity management. From a microeconomic perspective, no company operates at full capacity and there is always interest in new markets or ways of trading that might contribute to increased efficiency and competitiveness. Industries characterised by 'perishable' products or services have made concerted efforts in the past three decades to manage their supply chains and capacity better, most notably through

[2] Note: Recipco Holdings Limited is one of the sponsors of this report.

use of information technology. If capacity exchanges were to improve capacity utilisation markedly, they would be economically significant.

1.3.2 Trade

Trade underpins economic development and growth and is carried out through a variety of channels, both formal and informal. Trade can be facilitated in numerous ways, such as through formalised exchanges, third party brokers, government intervention or, more recently, through online platforms. Trade is primarily motivated by economic incentives (for-profit); but it is also encouraged to foster social cohesion and to generate wider benefits within society. A capacity exchange that allows organisations to access new trading channels and partners, and therefore increase trading opportunities, could foster economic growth and lead to wider socio-economic gains. Given the increasing complexity and sensitivity of supply-chains within industries, a capacity exchange that increases diversity and improves supply-chain efficiencies could be economically beneficial and perhaps reduce supply shocks.

1.3.3 Credit

The financial system provides credit. Companies also 'create' credit when they use their own goods and services (i.e. their productive capacity) to finance the purchase of other goods and services needed, without the use of sovereign currencies. Recent economic crises and subsequent efforts to rebuild bank balance sheets have reduced traditional financial credit facilities. Constrained credit supply has led some businesses to seek new credit sources in order to maintain trading activity. SMEs seem to struggle more than larger organisations to access trade finance and credit. Capacity exchanges which create alternative credit and reduce reliance on conventional credit could be very attractive in today's business environment, and countercyclical to sovereign currency credit cycles.

1.3.4 Money

Individuals and organisations have the 'capacity' to provide goods and services for trade. They then conduct trades, some of which are asymmetric, i.e. one side of the trade does not provide full settlement at the same time. Asymmetric trade typically involves deferring some obligation over time, creating a credit for one party and a debit for another. If these credits and debits are recorded, a unit of account is created. These credits and debits, if trusted and used, create a store of value. If these credits and debits can be traded - that is one party can use a credit they own to discharge a debt they owe to a third party - the credit and debit system becomes a medium of exchange, i.e. money. However, there are legitimate concerns about the trust, safety and complexity of common tender as a means of exchange compared with traditional finance.

1.3.5 Multilateral reciprocal trade

Multilateral reciprocal trade takes many forms, but countertrade and organised forms of 'barter' are worth emphasising as they are the most widespread. Countertrade consists of complex contractual arrangements where imports, exports and trade finance are all part of the same package. Corporate barter and retail barter are forms of multilateral reciprocal trade where member companies use their own goods and services to finance the purchase of other goods and services. Precise figures on corporate and retail barter trade are scarce, though Table 1.1 indicates some of the types of transactions encountered during the research. The

values of the trades in the table are imputed. These trades involved a number of different parties and were sometimes complex, with multiple participants often taking partial amounts. These types of multilateral reciprocal trades can require a significant degree of human resources to initiate and conclude.

Table 1.1 – Sample goods in multilateral reciprocal trade[3]

Goods/Services	Location	Value (US$)
Communication equipment	Europe	1,500,000
Rubber	Europe	1,320,000
Communication equipment	Europe	6,000,000
Software upgrade	Europe	7,000,000
Rechargeable batteries	Europe	650,000
Transport planning	Philippines	60,000
Coconut oil	USA	15,000,000
Copper cathodes	Singapore, China	15,000,000
Public relations	Philippines	100,000
Coconut oil	South Africa	1,900,000
Cordless phones	USA	5,800,000
Radar detectors	USA, Netherlands	1,500,000
Garments	Europe	7,800,000

Offers to trade are diverse and, as well as those in the table above, include aircraft, advertising, commercial windows, jewellery and real estate/property among others.

1.3.6 Countertrade

Regularly quoted figures state that countertrade accounts for 20% or more of world trade, involving some 90 countries and accounting for US$100 to US$150 billion (Platt, 1992; Carter, 1997). Countertrade is often used to structure international sales when conventional means of payment are difficult, costly or nonexistent, including in times of conflict (e.g. Libya), embargo (e.g. Iran) or currency shortages (e.g. in the former USSR) (Hill, 2011).

The governments of developing and emerging countries (e.g. Philippines, South Africa and Argentina) see countertrade as a way to control imports and government procurement sources while enhancing international trade positions, diversifying export industries and alleviating trade imbalances. Advanced economies usually refrain from explicitly promoting countertrade though governments often promote, underwrite or conduct countertrade in strategic industries such as military equipment or energy. Countertrade is often criticised and dismissed on the grounds of its complexity and the lengthy negotiations on quality, delivery and relative value. Perhaps because of their complexity, individual countertrade transactions are usually significant in volume and value.

[3] Goods, services and values are a representative sample from one exchange in the retail and corporate barter sector.

1.3.7 Modern forms of barter – corporate and retail barter

Increasingly common in North America since the 1950s, barter networks have enabled companies to use their goods and services to finance the purchase of other goods and services. Two models, corporate barter and retail barter, can be distinguished, principally by the size of the participants and their transactions. Corporate barter allows larger organisations to buy things such as media and advertising capacity in exchange for payment in a combination of unsold inventory and cash. Deals are brokered by specialist third parties who act as principals in the transaction (Healey, 2001). Retail barter networks or trade exchanges are more like marketplaces, now increasingly automated, for member SMEs to exchange goods and services with each other using a system of mutual credit based on a common tender such as trade 'pounds', trade 'dollars' or trade 'credits'. Common tender can only be 'spent' on the exchange and cannot be redeemed for cash, thus encouraging repetitive participation on the exchange.

Multilateral reciprocal trade seems widespread, though comprehensive data is sparse. According to the International Reciprocal Trade Association (IRTA), one of the industry trade bodies[4], some 700 retail barter exchanges exist as of 2009/10, most located in North and Latin America (IRTA, 2010). The most enduring retail barter exchange is the WIR multilateral commerce network, which has been operational in Switzerland for over 75 years, now comprising over 60,000 member SMEs (1 in 5 SMEs in Switzerland) with the value of WIR franc-based transactions amounting to CHW 1.627 billion in 2010 and representing circa 0.3% of Swiss GDP[5] for the same year (WIR Bank, 2010).

Ormita Commerce Network was originally a software provider for corporate and retail barter trade. It acquired some of its clients and now operates a franchise model allowing members to trade across an international network of exchanges. Ormita's worldwide network handled annual transactions worth over US$2.6 billion in 2010, with a presence in over 54 countries and offices in 24 countries. Ormita secures local partners with experience of doing businesses in their respective country's legal and socio-economic frameworks and offers them and their members trading opportunities at the international level. By offering wide-ranging trading opportunities and support services, including hospitality and travel barter, alternative funding for start-ups, commodity import offers, export assistance and countertrade, in addition to conventional corporate and retail barter, Ormita appears to meet a large portion of the various demands in the multilateral reciprocal trade industry.

A survey sent as part of this research to 200 existing corporate and retail barter exchanges elicited 26 responses. The survey indicated that SMEs usually form the bulk of membership (96% of respondents). Only one exchange surveyed included government agencies among its members, suggesting that direct government involvement is not yet significant in this industry, except in the context of countertrade. Most exchanges are small. Just over one third of respondents claimed that the annual value of trade on their exchange in 2010 was between US$1 million and US$10 million. Only two exchanges claimed that the value of trade on their exchange was greater than US$1 billion. As an indication of operational

[4] The other most prominent trade body is NATE – the US-based National Association of Trade Exchanges. There does not appear to be an equivalent trade body for the corporate barter industry.

[5] In 2010, Swiss GDP amounted to CHF 546.619 billion according to OECD statistics. Available from: http://stats.oecd.org/index.aspx?queryid=350 [Accessed August 19, 2011].

size, the ratio of the operational turnover to the value of trade on the exchange is in the order of 1:10 to 1:30, i.e. an exchange where trades are made worth US$1 billion might constitute a business of US$50 million.

1.3.8 Prospects for existing forms of multilateral reciprocal trade

The primary incentive for organisations to participate in multilateral reciprocal trade is the opportunity to source what they *need* using what they *produce* as payment, without the exchange of sovereign currency. The ability to pledge future capacity and production creates additional credit alongside traditional finance. While the proposition is attractive, commercial viability depends on the credibility of the marketplace and its operators, liquidity within the market to benefit members and the trust participants place in the common tender to be sustainable over time.

The multilateral reciprocal trade industry faces challenges. It relies on high degrees of trust, yet is not well understood by outsiders. Allegations of fraud (see, for example, discussions on Think Barter LinkedIn Group, 2011)[6] are associated with some issuers of common tender. With the exception of the Swiss WIR, formal financial regulation is sparse. While transactions are regulated for tax, the issuance of common tender and the management of mutual credit supply are not. Industry associations, such as IRTA, are attempting to self-regulate through standards and codes of conduct.

1.4 Trade and Tender

1.4.1 Common Tender

Money is often, inaccurately, assumed to be synonymous with sovereign or fiat currencies. Common tender is defined as "money … commonly accepted as payment of debt without coercion of legal means" (Timberlake, 1987b). Common tender is distinct from sovereign currency and the phrase is used in this report to refer to money issued by a capacity exchange to record trade credits.

Common tender in multilateral reciprocal trade creates an endogenous mutual credit supply by deferring purchasing power from present to future (Wray, 1990). Its purpose is to store value until a trading partner is found, and not to do so in anticipation of a real or speculative return on capital. Common tender is thus money as a means of exchange, rather than money as a source of capital and using it in B2B trade is therefore an investment in the persistence of the trading community. To operate effectively, common tender must be legal, usable in trade, transferable as a means of exchange, persistent and trusted. Existing types of common tender differ on a number of features including their backing mechanisms, their rate of acceptance and their mechanism of exchange, if applicable, with sovereign currencies.

In existing systems of multilateral reciprocal trade, common tender is generally backed by the productive capacity of members in the form of goods, services and infrastructure they produce. Trust in the operator of the membership network is crucial. Most common tender used in multilateral reciprocal trade is artificially

[6] Interviewees active in the corporate and retail barter sector who participated in this research cited anecdotal examples of retail and corporate barter exchanges failing due to deficit spending on the part of the exchange operator, as a result either of ignorance or wilful abuse.

pegged on a 1:X basis on sovereign currency in order to facilitate valuation, accounting and tax treatment. This does not mean that the value of common tender is equal to that of the sovereign currency. The value can be considerably lower if exchange operators resort to deficit spending, namely issuing common tender as credit that is not supported by goods and services, in order to attract new participants. There have been attempts to 'back' common tender, i.e. to guarantee its exchange into something else of value, such as a sovereign currency, physical commodity or resource e.g. a kilowatt hour (Birch, 2010: 40).

Common tender can be used either in whole or part as a means of exchange, e.g. "payment will be 50% cash and 50% common tender". The appropriate ratio of cash/common tender is disputed. The basic argument is between purists who believe common tender should be used on its own (e.g. IRTA), and those who believe that a mixture of common tender and cash works better (e.g. Swiss WIR). Purists feel that mixing sovereign currency with common tender in transactions leads to variable and uncertain acceptance across the membership, ultimately undermining the confidence participants may have in both the system and the common tender. Proponents of mixed means of exchange believe it helps leverage sales in both common tender and sovereign currency, while simultaneously allowing members some flexibility to manage their common tender budget.

As part of this research, a simulation experiment conducted in association with University College London demonstrated one environment in which trade values tend to be stable at extremes (either 100% sovereign currency or 100% common tender); whereas combining common tender and sovereign currency as means of exchange seems to create a complex relationship between acceptance and faith in common tender and sovereign currency. As evidenced in geographic areas where multiple currencies co-exist, this complexity can be surmounted if the benefits of trade are sufficient.

1.5 Emerging and innovative proposals

1.5.1 Alternative Currencies

Alternative currencies are increasingly discussed in both business and academia. Some, hardly exhaustive, examples help to set the scene. Facebook credits and BitCoins are attempts to create common tenders for virtual communities. Facebook is tied to its social network while BitCoins are intended to be used across communities. Linden dollars (Second Life) have an exchange rate with sovereign currency. Ven (Hub Culture) is attempting to move a community currency into the physical world as well, with physical trading 'pavilions'. The Ven is listed on Thomson Reuters' trading screens.

There are common tender initiatives not tied to capacity exchanges or online communities, such as the WOCU®, a currency basket derivative of 16 sovereign currencies weighted by the GDP of the top 20 nations. WOCU® are used, though not widely, in some commodity transactions. To date, there is no global common tender. Proponents of global common tender often claim that it would not only underpin multilateral reciprocal trade but also provide a unit with less exchange rate volatility against goods and services.

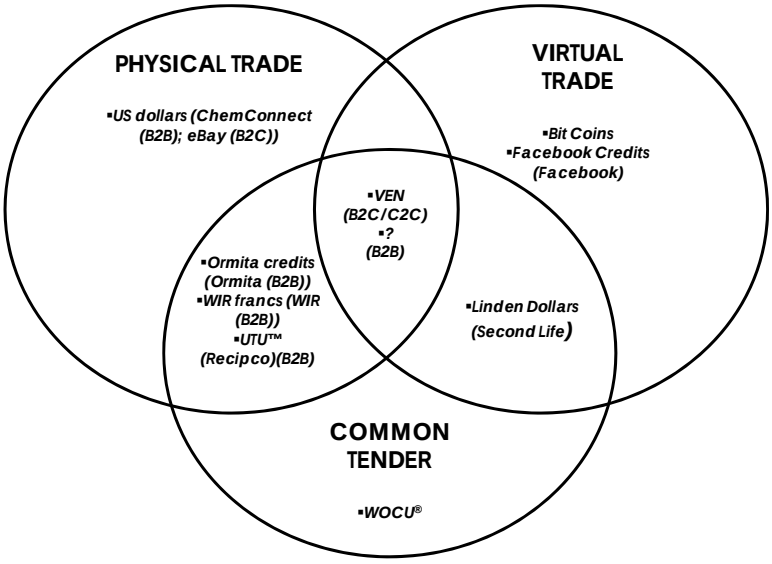
1.5.2 Innovative Proposals

A number of innovative proposals for multilateral reciprocal trade are emerging, offering prospects for international scale and, in some instances, expanding across existing exchanges. IRTA promotes the Universal Currency (UC). The UC is 'a trade exchange for trade exchanges' whose membership comprises 100 trade exchanges. The UC is an attempt to help exchanges trade with each other using a common tender accepted across multiple platforms.

Recipco™'s solution comprises a global electronic marketplace – Recipco Capacity Exchange™; a common tender – the Universal Trading Unit (UTU™); and a member-backed facility – RecipcoClear – which ensures the integrity and liquidity of the UTU™ with the available capacity of its members. Contrary to most common tender in the existing multilateral reciprocal trade industry, the value of the UTU™ is not defined by the cash-equivalent value of the goods and services traded in any transaction, but by an algorithm that takes into account weightings of five major sovereign currencies. As trade volume increases and participation expands, it is anticipated that the value of the UTU™ will be defined by the purchasing power of members of RecipcoClear (the larger global, listed multinationals) and backed by the balance sheets of RecipcoClear members. Recipco™ claims to offer an innovative solution for capacity management for both high-margin and low-margin producers.

Figure 1.2 illustrates the interactions of various common tenders with physical and virtual trade in both the B2B and business-to-consumer (B2C) segments. A notable gap is a common tender linking B2B physical and virtual trade. It should be noted that most of these tenders are still in their youth.

Figure 1.2 – Physical trade, virtual trade and common tender



1.6 Capacity exchanges: options, feasibility and potential - towards an 'optimal model'

Multilateral reciprocal trade – where all participants are ultimately both buyers and sellers – could flourish in industries that combine fungible products with low barriers to entry for two reasons: a highly competitive industry is likely to be inclined to pursue

new trading channels; and trading fungible products in demand across a range of industries increases the likelihood of participants finding something they need to buy after they have transacted a sale. Incentives for participation on a capacity exchange, in addition to offering a new line of credit, are likely to be influenced by industry margins and the perishable or persistent nature of goods and services.

Liquidity is important. Buyer and suppliers need to interact successfully often enough to give an exchange credibility for return visits. Critical mass has to be reached quickly, so attracting early adopters is fundamental to liquidity. SME participation is easier to secure than that of larger firms. Larger firms have direct access to capital markets. SMEs often have restricted access to traditional finance, i.e. primarily through banking relationships, and can be more open to new forms of credit. Historically, SME-based exchanges have been local or regional, rarely going national and not international.

Listed companies and large multinationals would be ideal early adopters given lower credit risk, name recognition and the potential for fast expansion through their supply chains. In practice, their participation is likely to be conditional on the ability of the exchange to offer goods and services specific to their requirements, and attracting them may be a slow process due to more complex decision-making structures than those in smaller firms. Governments could use exchanges as procurement channels to support economic development, but in practice their involvement to date has been low. Some local governments have supported capacity exchanges but for national governments, with the exception of Switzerland, the lack of support is unsurprising as they feel that common tenders might detract from sovereign currency.

A capacity exchange could comprise industry-specific members, offering them opportunities for vertical trading. Industry-specific success depends on participation by the industry's dominant players. A cross-industry capacity exchange featuring a wide range of fungible goods and services needed by most businesses would have to address wide-ranging requirements. That said, air travel (seats), hospitality (hotel rooms), telecommunications, logistics, transport, shipping, energy, printing, media and professional services (e.g. accountancy) are widely consumed goods and services that could underpin a cross-industry capacity exchange. A capacity exchange could grow internationally in different ways, including by joining a network of exchanges as a participating member (e.g. Universal Currency), or via a network or franchise (e.g. Ormita) where the exchange acts as the local partner representing the network.

A capacity exchange that is functioning at scale, has achieved critical mass and represents a liquid marketplace is likely to function on a high technology/low people ratio. In contrast, an early stage capacity exchange needs to expend significant efforts educating businesses on the benefits of the value proposition, attracting members and developing business, as well as brokering trades. Heterogeneity in trade leads to complexity, so the larger the ambitions of a capacity exchange the more significant the investment required to standardise contracts in terms of price, quality and specification.

Is there an optimal model for a capacity exchange? Though it is difficult to advocate a single capacity exchange model, three scenarios can be distinguished.

First, a few capacity exchange start-ups could emerge and grow regionally. Second, national capacity exchanges, similar to the WIR network in Switzerland could emerge, with sizeable membership, especially of SMEs. This probably requires national government 'fostering'. Third, one to several multilateral capacity exchanges could emerge internationally. One particular challenge internationally seems to be attracting large and listed companies. While there are examples of the first two scenarios, the third has not yet materialised. Some new international capacity exchange initiatives intend to target large multinationals in multiple industries where margin differentials could be best exploited through multilateral reciprocal trade.

1.7 Possible benefits and constraints to participation

A range of socio-economic benefits are put forward by proponents of multilateral reciprocal trade. Economic benefits include improvements in cash flow and working capital availability; increased sales and access to new sales channels; more jobs as a result of improved economic activity; a source of interest free credit; inflation protection; and reduced storage and waste due to a reduction in excess inventory. Wider benefits to society are, of course, linked to improvements in economic performance and growth, as well as reduced economic volatility. In addition to these, further suggested benefits include the reduction of fraud through transparency; an alternative means of providing venture capital to foster business and innovation; and a more efficient source of in-kind donation capital for the third sector.

Given the lack of consistent data within the existing sector, a quantitative analysis of the asserted economic and social benefits of multilateral reciprocal trade is necessarily limited. Socio-economic benefits are likely to be a function of the trust which participants place in a capacity exchange, the integrity shown by the exchange operators and the exchange's endurance over time, all of which are unknowns. Additionally, benefits accruing from such trade will necessarily be determined by the particular model of capacity exchange pursued. For example, exchanges targeted at SMEs operating at a national level (such as the Swiss WIR) will inevitably have a different impact than an exchange where trade takes place across borders and where the counterparties are listed multinationals with significant market capitalisation.

Table 1.2 outlines possible benefits to the UK – including the potential for job creation and increased sales for participants - that might accrue from three possible capacity exchange options: Small - several UK exchange start-ups; National – a UK capacity exchange (SME-oriented) similar to the WIR and proportional to the UK economy; Multinational - a few multilateral capacity exchanges (based in the UK with benefits diffused globally). It is important not to overstate the benefits that a capacity exchange might bring. The multilateral reciprocal trading system with the most longevity is the Swiss WIR. Although the Swiss WIR has been established for 70 years, it still represents just 0.3% of Swiss GDP. Nevertheless, the numbers presented here attempt to give some estimate of the ranges which might be achievable.

The direct jobs created by the exchanges would be small. The benefits for trade participants include increased credit, wider markets (where the benefits are based on inter-membership assumptions) and capacity utilisation (where the benefits are based on less wastage going through to higher margins). Wider job creation among

the trade participants is estimated in line with increased turnover for these firms. Currency hedging costs are assumed to decrease when using a common tender internationally that is based on a basket approach, e.g. SDRs, WOCU® or UTU™. In-kind donation effectiveness is a proposed benefit that proved difficult to quantify, as did reduced wastage and storage. Another unquantified benefit is 'soft' investment in new businesses, where participants use spare capacity to help start-ups. Finally, a less volatile, more counter-cyclical economy is tough to value, but some indicative calculations are presented based on a mid-range implied GDP volatility reduction valued using a standard option pricing model.

Table 1.2 – Summary of benefit estimates

	Option 1 Small - several UK exchange start-ups	Option 2 National - UK capacity exchange (SME-oriented)	Option 3 Multinational - a few multilateral capacity exchanges based in the UK
Direct benefits			
Job creation through the exchange (total)	25 to 100	70 to 300	200 to 500
Increased credit capacity	£20 million to £164 million to £250 million	£15 billion to £65 billion to £80 billion	£25 billion to £132 billion to £160 billion
Wider markets - increased sales (more competitive & innovative)	£2 million to £16 million to £25 million	£5 billion to £13 billion to £20 billion	£10 billion to £40 billion to £60 billion
Capacity utilisation - higher margins (more competitive & innovative)	£250 million to £1.4 billion to £3 billion	£8 billion to £14 billion to £20 billion	£50 billion to £110 billion to £200 billion
Job creation for participants	100 to 140 to 200	50,000 to 110,000 to 150,000	200,000 to 525,000 to 650,000
Reduced currency hedging costs	nil	nil	£5 million to £18 million to £30 million
Wider benefits			
Improving in-kind donation effectiveness	unlikely	likely, medium & national	likely, low & international
Less volatile, more counter-cyclical economy	nil	£50 million to £300 million to £1 billion	£100 million to £860 million to £2 billion
Sustainability benefits			

	Option 1 Small - several UK exchange start-ups	Option 2 National - UK capacity exchange (SME-oriented)	Option 3 Multinational - a few multilateral capacity exchanges based in the UK
Reduced wastage	small	high	high
Reduced storage	nil	small	small

Option 1: Several UK exchange start-ups are established in the UK. Several hundred SMEs trade on these exchanges at some frequency. Bottom, likely and top range calculations are based on sample accounts of similar exchange operations[7] and on the turnover, employment and other economic data of UK SMEs. This option has a large ratio of benefits to investment, although relatively few jobs or directly measurable turnover.

Option 2: A leading national capacity exchange emerges in the UK. Assumptions and calculations are based on an exchange comparable to the Swiss WIR. The middle range calculations are based on the participation of 1 in 5 UK SMEs, taking into account recent UK GDP and relevant economic data for SMEs. If successful, such an exchange could potentially make a tangible contribution to the UK economy and wider society. For a less volatile economy the option inputs centred on assuming UK GDP of £1.336 trillion (2010) reducing its annual volatility by 0.1% from 6.81% to 6.74% on long-term growth rates of 1%. Job creation and benefits are high for the level of investment, principally because small improvements in market access and capacity utilisation have a very high impact.

Option 3: One, but possibly several, multilateral capacity exchanges, based in the UK, operating internationally, with government 'fostering', principally through active oversight. The proposition draws on three models which have been discussed in this report: an exchange operating at a global scale (Ormita); an innovative proposition aiming to target large multinationals and other listed companies (Recipco™); and a 'trade exchange of trade exchanges' using a single common tender across multiple membership bases (Universal Currency). If similar exchanges were successfully established with headquarters in the UK, benefits could potentially be substantial, although many of these would be diffused globally. For a less volatile global economy the option inputs centred on assuming G8 GDP of £22.13 trillion (2010 estimate) reducing its annual volatility by 0.1% from 1.75% to 1.74% on long-term growth rates of 3.79%. This result does not scale linearly with a single nation as the G8 GDP already has lower volatility.

1.8 Policy considerations

Two observations suggest that regulation might help to encourage capacity exchanges: the first is the high incidence of fraud allegations from those in the multilateral reciprocal trade sector today, which could deter potential participants; the second is the increased sensitivity of industry to credit facility stability (ICC, 2008; BIS, 2011). Two basic areas might be suited to regulation – the conduct of business on the exchanges and the issuance of common tender.

[7] Based on annual reports of existing corporate and retail barter exchanges.

Three regulatory models might suit the multilateral reciprocal trade sector. First, self-regulation, where membership of an industry association and adherence to its conduct of business rules reassures traders. Two trade bodies – IRTA and the National Association of Trade Exchanges (NATE) – are attempting to self-regulate through lobbying, professionalization of trading and certification. While they seek to advance best practice, there is no evident regulation around common tender.

Government regulation is a second option. Trading standards regulation might suffice for the conduct of business on the exchanges, but regulating the issuance of common tender might involve financial regulators. Contrary to most exchanges which are private companies, the Swiss WIR is subject to Federal banking regulation, with oversight on the issuance, supply and credit allocation of WIR francs. Other regulatory frameworks of relevance include electronic commerce regulation and payments regulation. Yet for a nascent industry with uncertain prospects it may be too early for direct government intervention.

A third option is standards market regulation using accreditation and conformity assessment.[8] Used in a number of areas (e.g. shipping, fire safety, airlines, automotives, railways, electricity, food safety and health) this model encourages open standards where development of the standard is a structured, inclusive process involving interested stakeholders. Standards can be developed either alongside an authorised and independent accrediting body for certification agencies such as the United Kingdom Accreditation Service (UKAS); or via industry mutuals such as the Programme for the Endorsement of Forest Certification (PEFC) for sustainable forestry. Accreditors regulate the market and ensure the separation of standards development from the commercial elements of implementation and review. The standards market regulation model is used in finance, e.g. ISO 22222 (personal financial planning) and AS3806 (financial services compliance); various IT standards such as ISO 27000 (information systems security); and by firms which obtain ISO 9000 (quality management) or ISO 14000 (environmental management), though certainly not as widely as in other industries.

Government could 'foster' the nascent capacity exchange industry either by pushing towards formal government regulation or towards developing an ISO standard for common tender, with a view to these being audited by certifications agencies in future. A declaration by a government that it has a structured view on regulation for the industry might attract capacity exchanges and novel common tenders.

1.9 Guidance and recommendations to policy makers

London has long been a centre for diversity in trade and exchange because of its people, business environment, market access, infrastructure and general competitiveness. The breadth and scale of formally recognised trading in London includes foreign exchange, shipping, capital markets, commodity markets and insurance markets. London has been recognised as a place for "fair trade", with a common law system, numerous standards bodies and trained trade and financial professionals. London should be an ideal location for capacity exchanges.

[8] Declaration: one of the report authors is a non-executive director of United Kingdom Accreditation Service, the UK's national sole accreditation body for certification, testing, inspection and calibration services, effectively the UK regulator.

If the scale of benefits described is sufficiently interesting for policy makers, then this research suggests that there are five main areas where policy makers could foster multilateral reciprocal trading structures, as outlined in Table 1.3.

Table 1.3 – Policy recommendations

Policy recommendations	Options	Desired outcomes
1. Improve understanding of multilateral reciprocal trade **HIGH importance**	**Government monitoring and information disclosure through:** ♦ HMRC tax filing; ♦ Office of National Statistics; ♦ annual survey of capacity exchanges, corporate participants.	♦ further understanding of capacity exchanges, related risks and opportunities; ♦ improve data monitoring, consistency and disclosure; ♦ monitor evolution of capacity exchanges; ♦ monitor impact on wider economy.
2. Regulation – common tender **HIGH importance**	**Government regulation options via:** ♦ FSA and e-commerce or payment mechanisms; ♦ Bank of England and supervision of credit institutions. **Standards market regulation options via:** ♦ accreditation and third party certification/standard bodies; ♦ indemnification via insurance or re-insurance. **Self-regulation options via:** ♦ industry trade body.	♦ build confidence in the market through government support; ♦ prevent fraud (e.g. deficit spending); ♦ oversee volume of issuance and backing mechanisms; ♦ provide a legal reference for potential users/ members.
3. Regulation – capacity exchange **MEDIUM importance**	**Government regulation options via:** ♦ FSA and e-commerce or payment mechanisms; ♦ Bank of England and supervision of credit institutions; ♦ trading standards. **Standards market regulation options via:** ♦ accreditation and third party certification/standard bodies. **Self-regulation options via:**	♦ improve credibility and integrity of the industry; ♦ develop standards of business conduct; ♦ advise on tax treatment and obligations.

Policy recommendations	Options	Desired outcomes
	♦ industry trade body.	
4. Establish a centre of excellence through an 'office of capacity exchanges' **MEDIUM importance**	**Provide support by**: ♦ establishing a business network for capacity exchanges; ♦ promoting dialogue with relevant government bodies and officials; ♦ promoting cooperative indemnity vehicles, e.g. mutual insurance, indemnity insurance; ♦ promoting research into the economics and technology of capacity exchanges; ♦ encouraging discussion of the emergence of common tender at a time of likely shifts in international monetary systems; ♦ developing adequate education programmes for trade and procurement professionals. **Provide guidance on key issues including**: ♦ insolvency and wind-up arrangements; ♦ client asset protection rules; ♦ taxation; ♦ compliance with anti-money laundering regulations; ♦ anti-counterfeiting and grey market problems; ♦ credit and Basel III implications; ♦ best execution requirements; ♦ links with other UK e-commerce initiatives on payment.	♦ build confidence in capacity exchanges; ♦ encourage participation; ♦ provide reassurance to current and prospective participants; ♦ improve visibility and credibility of the industry
5. Integrate capacity exchange hub policies with wider government policies **MEDIUM importance**	**Integration with:** ♦ procurement in general – all government procurement department functions and agencies; ♦ promotion – UK Trade & Investment; ♦ innovation and research – BIS; ♦ technology – Technology Strategy Board; ♦ immigration – Home Office, UK Border Agency, UK Visa Bureau; ♦ competition – Office of Fair Trading.	♦ increase attractiveness of capacity exchanges for existing organisations with international operations.

1.10 Conclusion and areas for further research

Multilateral reciprocal trade is an emerging sector that has the potential to create complementary credit systems alongside traditional financial credit. Capacity exchanges are clearly at an early stage of development, with diversity in approaches, participants, industries and scale. Capacity exchanges appear to have the potential to increase trade and growth, and to provide other economic and social benefits. It is clear that such potential is tied to the trust participants place in the exchange model and the common tender, as well as levels of liquidity. If capacity exchanges were formally recognised, a more solid regulatory framework might encourage more rapid development.

Policy makers are generally unfamiliar with multilateral reciprocal trade. This research has identified significant gaps in data and understanding. UK academics consulted as part of this research pointed out that most existing research ignores or misses multilateral reciprocal trade. Equally, export and other economic statistics fail to provide a fair account of existing multilateral reciprocal trade in terms of type, volume, scale and value. These gaps are partly explained by the lack of definition, the variety of multilateral reciprocal trade and the fact that, being 'non-monetary', such trade avoids traditional statistical data acquisition. A barter deal between two corporations might only appear in trade statistics as shipping tonnage. A barter deal between two corporations within a country might not appear in official statistics at all. Suggestions for further research will depend to a great extent on the efforts put into improving data sources for further analysis, particularly in order to model the issuance and performance of common tender, levels of liquidity on a capacity exchange, and counter-cyclical impact that may arise in relation to the mainstream monetary economy. Some useful further research might cover:

- possible applications of peer-to-peer currencies in B2B environments;
- systematic data collection approaches on countertrade and multilateral reciprocal trade;
- behavioural trade decisions and perceptions of multilateral reciprocal trade value;
- stability and volatility of common tender compared to sovereign currencies under different conditions (e.g. one common tender, multiple sovereign currencies; multiple common tender, multiple sovereign currencies);
- modelling of socio-economic benefits of multilateral reciprocal trade, especially in relation to economic growth;
- modelling optimal pricing for capacity exchanges;
- better dynamic economic models of capacity, trade, credit and money.

1 Project Background

This chapter discusses the capacity exchange concept. It then outlines the objectives and scope of the research, the research approach and the underlying methodology, and provides details of the interview and research process. It concludes by providing a summary of the report structure.

1.1 Capacity exchange concept

The term 'capacity exchange' is largely undefined in both business and academia. Conceptually, a capacity exchange is a formal mechanism to facilitate what is commonly known as 'barter trade', 'cashless trade' or 'non-monetary trade'. These three terms refer broadly to a sector where business-to-business (B2B) trade is facilitated by a means of exchange other than sovereign currencies and where the means of exchange used in the transaction is redeemable only for other goods and services within the membership group where it is used. Since a means of exchange is one of the characteristics of money, the three terms identified above are possibly misleading: 'cashless', 'non-monetary' and 'barter' all imply that no money is used in trade, yet the role of a means of exchange in such trade implies that these terms are not strictly accurate. Typically, capacity exchanges design their means of exchange (i.e. their money) in such a way that it can only be spent on the exchange. There is no incentive to hold on to the means of exchange (i.e. no interest rate) and it cannot be redeemed for cash. This design encourages re-participation within the system and, furthermore, implies that every buyer must also be a seller and vice-versa. This report therefore refers to 'multilateral reciprocal trade' to describe a sector where trade takes place between three or more participants and is facilitated by a means of exchange other than a sovereign currency; and where the means of exchange is backed by the goods and services of the trading participants and is not necessarily convertible to cash. The terms non-monetary and cashless are avoided where possible; the term barter is used in the report where unavoidable because it reflects terminology that is commonly accepted within the sector as it exists today (see Glossary).

This report defines a 'capacity exchange' as:

> *"a membership-based system within which companies can trade available capacity in the form of goods, services and infrastructure[9] within and across industries, using common tender as a medium of exchange."*

1.2 Objectives and scope

The City of London Corporation, the Economic & Social Research Council and Recipco™ Holdings Ltd commissioned this report from Z/Yen Group to explore the concept and application of a global capacity exchange hub in the UK. A hub is understood to be a focal point, such as a particular city or region, where the capacity exchange sector might develop and expand because the particular attributes of that city or region would be beneficial to the progression of multilateral reciprocal trade. Of particular interest to the sponsors are insights into how capacity

[9] Capacity is the capability of a firm to provide 'goods, services and infrastructure'. Capacity therefore refers not only to productive capacity but also, for example, to inventory, marginal production or alternative infrastructure use. Examples of alternative infrastructure use include using the electricity distribution system for data or timing, allowing telecommunications providers to use railway wayleaves or sharing computing capacity during different time periods.

exchanges might operate across different markets and in different economic climates; the extent to which such exchanges might offer an alternative source of credit for the development of economic trade and growth; and the potential for further academic research particularly around alternative currency designs.

The intended audience of this report includes, but is not limited to, senior industry executives, particularly Chief Executives, Chief Financial Officers and Heads of Procurement; professional services executives involved in developing the legal and regulatory structure of financial exchanges; academic researchers with a particular focus on market dynamics, trade and growth and new technologies to facilitate financial activity; government ministers and policy-makers working at both national and European levels; and members of the wider community with an interest in financial innovation.

The aim of the research is to assess the appetite among commercial firms for innovative ways to trade; while also considering the feasibility – technological, legal, regulatory, political and economic – of establishing a capacity exchange, or hub of exchanges, in London. The research considers possible models for a capacity exchange or hub of exchanges; the extent to which the functionality of capacity exchanges is tied to the issuance of common tender; and the potential costs and benefits that could accrue if a capacity exchange hub were to be established in London.

Given the scope of the topic, the research is necessarily broad. The main areas of this report cover:

- CONTEXT – the current political, economic, social and technological environment in which business to business trade and trade finance take place today;
- CAPACITY – how capacity is defined and measured; the extent to which there is significant unused or available capacity at an industry level and at a country level, and the extent to which this is recognised as a problem at scale; economic theories of, and industry strategies for, capacity management;
- TRADE – how trade benefits economic growth; who participates in trade, what is traded, forms of trade facilitation and recent trends in trade.
- CREDIT – the use and provision of working capital finance and other forms of trade finance; and the extent to which traditional credit supplies are effective in facilitating trade and growth;
- MONEY – the role and effectiveness of money in trade and within communities where there is a shared interest (economic or otherwise), including private and community currencies;
- MULTILATERAL RECIPROCAL TRADE – the concept and existing forms of multilateral reciprocal trade, with specific reference to three models: countertrade, corporate barter and retail barter; the issuance and implications of common tender as a means of exchange; emerging and innovative propositions;
- COMMON TENDER USED IN TRADE – economic implications for trade; the emergence of common tender, and their application, including rate of acceptance, and concepts of trust and value over time;
- CAPACITY EXCHANGE OPTIONS AND FEASIBILITY - the key variables and possible formats that a capacity exchange might take to achieve different scales for trade and enterprise;

- COSTS AND BENEFITS – the potential economic and wider costs and benefits of establishing a capacity exchange or hub of exchanges to facilitate multilateral reciprocal trade;
- POLICY IMPLICATIONS – the need or otherwise for regulation; possible regulatory models; London's attractiveness as a potential host for a capacity exchange hub.

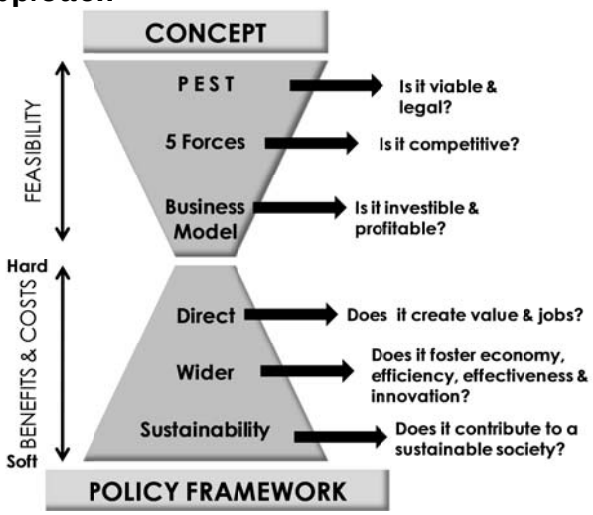
The research excludes chance trade and occasional bilateral/direct barter as well as business-to-consumer (B2C) e-commerce platforms such as eBay, Lastminute.com or Amazon, although these are interesting organisational and business models to compare with B2B capacity exchanges. Forms of multilateral reciprocal trade that are considered relevant include countertrade; and modern and organised forms of retail barter and corporate barter. Certain forms of local exchange trading systems (LETS – see appendix 17) are also deemed to be relevant in order to contextualise the capacity exchange concept, particularly those LETS focusing on business participation.

The research is weighted towards multilateral capacity exchanges that could operate at a global scale.

1.3 Approach and methodology

The project approach consisted broadly of two phases. Figure 2.1 offers a high-level overview of the stages of the research, and the overarching questions which guided them.

Figure 2.1: Project approach



The Feasibility phase included an assessment of the political, economic, social and technological (PEST) environment in which trade and the extension of credit currently take place; interviews with a range of professionals to determine understanding of, and attitudes towards, the concept of a capacity exchange; research into the use and implication of alternative forms of money, including 'trade credits', common tender, community currencies and others; and an exploration of the various forms a capacity exchange could take and which would be more or less competitive in the current trade environment.

The Cost & Benefit stage addressed the direct and wider economic and social benefits that might accrue from the establishment of a capacity exchange, and also any effect it may have on social and economic stability (such as generating employment or reducing currency volatility). Suggestions for regulators and policy-makers to consider were explored in relation to both the Feasibility and Cost & Benefit analysis.

Quantitative analysis of capacity exchanges is constrained by the lack of an agreed definition, a diversity of unorganised participants, inconsistent financial reporting and low recognition of the sector in official trade statistics. However, the research team endeavoured to pursue a quantitative and qualitative research methodology, including:

- Qualitative research:
  - semi-structured interviews with 66 interviewees from a range of sectors (see table 2.1);
  - two expert workshops held with the research team; and
  - a symposium organised at Gresham College where 20 participants focused specifically on the dimensions of trade and credit.

- Quantitative research:
  - a survey of 200 existing retail barter and trade exchanges (see appendix 9);
  - statistical analysis of trade and capacity nationally;
  - statistical analysis of the credit requirements of the top 500 international firms by market capitalisation;
  - modelling of possible trading dynamics and behaviour within one particular model of capacity exchange.

- Desk research:
  - theories of capacity management and market dynamics;
  - economic theory including theories of money, such as Modern Monetary Theory or Chartalism, credit and debt.

1.3.1 Interviews

Semi-structured interviews were conducted with 66 interviewees from the following areas: trade associations; industry sectors (energy, airlines, travel and transport, information providers); accounting; commercial law; banking and finance; financial exchanges and clearing houses; retail barter and corporate barter companies; innovators in multilateral reciprocal trade and capacity exchanges; UK government; third-sector; financial and other regulation; and academia. No organisation consulted during the course of the research claimed to be operating at full capacity all the time. All were interested in how they might be able to realise value from unused capacity.

Table 2.1 summarises the interviews conducted for this project. Some interviews were conducted on an anonymous basis. Of those who agreed to be credited in the report, a list of interviewee affiliations is contained in appendix 4.

Table 2.1 - Interviews

Type	Total Interviews
Academic	6
Banking and finance	5
Experts and professionals	8
Financial exchanges and clearing & settlement	10
Industry & trade associations	16
Legal	3
Multilateral reciprocal trade exchanges	11
Third Sector	3
UK Government	4
TOTAL	**66**

Interviews lasted between 45 and 90 minutes and followed a semi-structured model, based on an interview agenda template (appendix 5), adapted to respondents' expertise areas, together with discussion tables on assumptions, constraints and benefits (appendices 6 to 8). A framework of assumptions (appendix 6) was created to explore the interplay between the key concepts relevant to the research, viz. capacity, trade, credit and money. The framework of assumptions was explicitly designed to provoke discussion using simple assertions as a starting point to explore the much more complex relationship between capacity, credit provision and trading patterns. The assumptions are synthesised below with some pertinent remarks from respondents:

Assumption 1 – Companies have unused capacity in the form of goods, services & infrastructure and trading this available capacity would be beneficial.
Most respondents agreed with this assertion as companies experience some form of excess capacity at various points in their cycles. However, they felt that well-run companies ought to make sure that they do not have significant unused capacity. Nevertheless, additional trading/sales channels to make use of unused as well as available capacity could be beneficial, though this is likely to depend on the nature of the products and services. One senior executive remarked that "*We would be very interested in finding a way to monetise excess capacity – these conversations have already been happening but never lead anywhere*".

Assumption 2 – Access to credit is constrained in the current economic climate, if not beyond.
Responses to this statement were mixed. Some respondents agreed, emphasising that access to credit is particularly difficult for SMEs compared to large and multinational corporations who are subject to credit ratings and often have access to debt markets. For example, one respondent asserted that "*Due to the recent financial crisis my credit profile has worsened dramatically but my business hasn't changed*". Other respondents contested this assumption. While recognising that the credit market was not functioning efficiently due to the recent financial crises, they highlighted that providing more access to credit could present systemic risks and that the economy should not be built on credit.

One respondent noted that credit control was probably the most important function of a multilateral capacity exchange but that *"some people don't deserve credit"* and *"credit is often created to hide the risk involved"*. To many respondents, banks clearly fail to take into account all available credit, but there may not be much more to be freed by trade credit. There was a need for reassurance that a large multilateral capacity exchange wouldn't experience a liquidity crisis, perhaps even in good times. Respondents recognised that fractional reserve banking gave banks a significant advantage in lending through their ability to create money, with the consequence that when times were good banks would lend against capacity and thus crowd out trade credit. If an alternative form of substantial credit provision existed, it might form a useful counterweight to the boom-and-bust cycle of traditional financial credit.

Assumption 3 – Existing B2B trading avenues are incapable or insufficient to address the capacity problem. A multilateral capacity exchange could help address these issues of excess capacity, lack of access to credit and trade constraints.

Most respondents agreed in principle with this assertion. A typical response was that "*although there are already numerous markets, we would always be interested in additional sales channels*". Increasing the range of trading/selling channels for goods, services and infrastructure, was deemed to be beneficial but there were some restrictions. First, while a capacity exchange could help in theory to address excess capacity, respondents were unfamiliar with thinking about how it could help access to credit. Second, they highlighted that the scope and relevance of such trading avenues would depend on the structure of the exchange and the nature of goods and services proposed (particularly the extent to which such goods could be standardised and made 'liquid'). Of those who disagreed, one respondent asserted that "*the plethora of existing trading venues and tools provide everything needed to procure and sell. One large successful capacity exchange would constitute a single point-of-failure risk*."

Assumption 4 – In trade, a private or alternative currency could be as effective as sovereign (state-issued or fiat) currency.

In theory, some alternative currency designs could be as effective as a sovereign currency, depending on whether an alternative currency meets the conditions of liquidity, ubiquity and, most importantly, the challenge of being trusted by those that use it. As one respondent said, sovereign currencies "*are too expensive for what they do*" while another asserted that "*Governments abuse currency for taxation purposes*". Although one respondent believed that "*If fiat currencies were to break down further, then maybe an alternative currency could be effective*", and another asked whether trade was "*impaired*" by sovereign currency, most respondents appeared to believe that sovereign currencies would continue to dominate trade.

1.3.2 Survey

In order to better understand existing multilateral capacity exchanges, a short online survey (appendix 9) was sent out via email to 200 such exchanges operating across 59 countries on 17 August 2011. The survey was designed to explore the geographic reach, membership type, size, volume of transactions and type of services currently offered by this industry, as well as the extent to which key industry sectors (such as media or telecommunications) feature on these exchanges. 26 organisations completed the survey (see appendix 9 for an analysis of the survey results).

1.3.3 Workshops and symposium

Two workshops were held with the expert research team (see appendix 4) in June and July. The first workshop identified key concepts, relevant economic theories, literature for desk research and potential interviewees. The discussion focussed on concept definition; defining a framework of assumptions; the political, economic, social and technological context in which trade takes place today; and drivers for and constraints to trade. The second workshop took place one month later and focussed on the different models that a capacity exchange might take as well as the implications on the operational set-up and feasibility of a multilateral reciprocal trading sector that might grow significantly. The workshop was also used to develop and structure the outline of the final report.

The symposium at Gresham College was organised to explore the key concepts of trade and credit as they relate to multilateral reciprocal trade. It was aimed particularly at the academic community engaged in research in the area of new currency design and the economic implications of multilateral reciprocal trade and capacity exchanges. Academic participation both at the symposium and subsequently through the interview process was somewhat limited. One observation from this research is that multilateral reciprocal trade is little researched in UK academic institutions.

1.3.4 Structure of the report

The following chapters will provide the political, economic, social and technological context in which the research takes place (Chapter 3), and will further explore four key concepts – capacity (Chapter 4), trade (Chapter 5), credit (Chapter 6) and money (Chapter 7) – which underpin the discussion of the feasibility and potential for multilateral reciprocal trade to emerge as a significant trading architecture. Chapter 8 assesses emerging architectures of trade - including countertrade, corporate barter and retail barter - that are currently in use alongside conventional forms of trade; and takes a critical look at the potential within the sector. Chapter 9 focuses on the use of common tender as a means of exchange in trade and explores the extent to which trust in common tender affects its efficacy as a means of exchange to trade. In Chapter 10, emerging innovative propositions in multilateral reciprocal trade are outlined. The chapter goes on to discuss the critical variables of a capacity exchange, such as industry type, participant size, the addressable market for a capacity exchange, the range of goods and services traded, the scope and geographic reach, the common tender structure and possible trading models. In light of this analysis, Chapter 11 considers the possible economic and wider costs and benefits of establishing a capacity exchange or hub of exchanges, at both a national and a global level. Chapter 12 develops potential policy implications, with a particular focus on London's potential to be a host city for such enterprise(s). The report concludes by outlining policy recommendations as well as areas for further research.

2 Context of the Research

This chapter offers an overview of the political, economic, social and technological context relevant for the development of capacity exchanges; and through which the potential for multilateral reciprocal trade can start to be assessed. It examines in turn the impact on trade of the recent financial crises including their implications for sovereign currencies; the emergence of new currencies in times of economic crisis; emerging architectures of trade; and the role of technology in facilitating innovations in finance and trade.

2.1 Recent financial crises

As mentioned in a recent OECD Economic Outlook, "the global economy is exiting the recession but not returning to business as usual" (OECD, 2011d: 5). World economies are still in the process of recovering from the recent financial crises since 2008. Termed the "severest crisis since the Great Depression" (IBRD and World Bank, 2009: 24), or 'crises' depending on one's view, the financial crises have slowed annual global GDP growth to 2% in 2008 from an average annual 5% between 2003 and 2007 (IBRD and World Bank, 2009: 24). According to the International Chamber of Commerce (ICC) Survey 2011, world trade fell by 23% or US$3.5 trillion between 2008 and 2009 (International Chamber of Commerce, 2011), as a result of disruptions in international capital markets and reduced trade finance on the supply-side, as well as reduced demand in most developed countries. While trade levels have recovered, with an increase in world trade of 13.5% in 2010, this recovery has been uneven with African countries suffering the most and developed countries seeing feeble recovery (Sarisoy-Guerin, 2009; International Chamber of Commerce, 2011).

Credit is critical to trade, with 80% of total trade transactions involving some form of credit (ICC Banking Commission, 2011: 11). After severe credit shortages during 2008 and 2009, trade finance and market conditions seem to have been restored in developed countries. Trade finance availability and costs vary across emerging and developing countries depending on the credit-worthiness of traders and the risk aversion of commercial banks (International Chamber of Commerce, 2011). In Europe, output levels are recovering in light of forecasts of export growth and a gradual strengthening of domestic demand. Given the prospect for higher profit and capacity utilisation levels, companies are investing in equipment again, perhaps a promising sign for growth in 2012 and beyond (International Chamber of Commerce, 2011).

Fiscal deficits have increased as a result of reduced government revenue and rising social benefits payments. Fiscal stimulus measures undertaken at the beginning of the crises to stabilise financial markets have increased deficits (United Nations, 2011). Thus, government debt ratios have increased and are forecast to reach 83% of GDP in the EU and 88% in the Euro area (European Commission, 2011) by 2012. The level of UK government debt is approximately £1 trillion, or £40,000 per household. Taking into account public sector pension liabilities the figure for the UK government's share of debt goes up to £1.34 trillion.

> "UK personal debt is as much again at £1.45 trillion (in line with a year's GDP). But out of this £1.24 trillion is long-term mortgage debt on households, a robust form of debt. That leaves £210 billion in short-term personal debt, including personal loans, overdrafts, credit cards and retail credit. This works out to £4,537 per person which seems on the high side especially allowing for the fact that many would have no debt. However, much of it is used to finance car purchase and also to finance businesses. Government debt is expected to cost £43 billion in interest this year (3% of GDP). So, overall debt financing costs may already be equal to 10% of GDP." (Heffernan, 2011: 2)

Increasing debt ratios raise concerns about the quality of government debt, fears of inflation and tensions about reserve currencies, and thus the quality of sovereign currencies is increasingly questioned.

Concerns over defaults and rising debt levels as a result of fiscal and macroeconomic imbalances in turn affect monetary stability and exchange rates. The Euro and US dollar are trading at much lower trade-weighted levels than they were before 2008, despite attempts to slow debt increases through structural reform programmes (Bini Smaghi, 2011). Structural reforms in developed countries promise to boost economic growth while supporting fiscal consolidation and supporting monetary stability (OECD, 2011d: 5), but monetary challenges add stress to fragile economic recoveries.

In contrast, emerging and developing countries have contributed to more than half of the expansion of the world economy since late 2009. China, India and Brazil lead this expansion, building on strong ties among developing countries and their global value chains. Capital flows have surged into emerging market economies, increasing revaluation pressures on their currencies and hindering room for manoeuvre to support growth while restructuring their economies (United Nations, 2011). Although developing country trade and industrial output exceeded pre-crises levels in 2010, uncertainty lingers over their dependence on the demand from developed countries for exports, on aid finance and on sources of capital for future growth.

2.2 Coping mechanisms in times of crisis - new types of money

The financial crises in the US and Europe have affected not only economic output, trade and finance, but more importantly incomes, jobs and purchasing power. A recent UN Global Outlook estimated that at least 30 million jobs were lost between 2007 and 2009. Unemployment levels remain relatively high today in developed countries, including a higher proportion of structural employment. Globally, 47 to 84 million more people are estimated to have fallen into, or remained in, extreme poverty because of global financial crises (United Nations, 2011). Indeed, the crises were transmitted to all sectors of society through channels of trade, remittances, informal economy and government spending (Green et al, 2010).

2.2.1 Community, credit and alternative currencies

Alternative currencies such as trade credits are not a new phenomenon in European and other developed countries. Times of economic recession and limited money supply encourage the emergence of community exchange networks and alternative currencies where trust and community play a key role. The Freiwirtschaft movement of the 1910's and the intellectually similar social credit movement of the

1920's promoted the idea of local currencies with negative interest rates. In Germany, a number of regional currencies are used as an alternative to the euro. Conceived almost exclusively as *Schwundgeld* (depreciative currency), which loses value on a predetermined timescale, they are intended to be spent by their owners swiftly in order to encourage the use of productive assets for local economic development. A 2006 Deutsche Bundesbank discussion paper claims that the "*Schwundgeld* concept is suboptimal from a welfare-theoretical perspective" (Rösl, 2006: 4). Given that the overall volume of regional currencies in circulation in Germany amounts only to roughly €200,000, the economic welfare losses resulting from the issuance of *Schwundgeld* are, however, very small (Rösl, 2006). *Schwundgeld* are criticized for depressing trade with the global system and perhaps total wealth generation, though proponents note that minimal local needs can be met in the absence of a functioning or available global system, i.e. a local community can hedge against national or international economic catastrophe. Proponents would point out that the Bundesbank assumes sovereign currencies function well at all times when actually they have periodic crises. Critics also believe that the demand stimulus is short term, while proponents note that *Schwundgeld* don't permit rapid monetary growth and are meant to dampen cycles, i.e. demand stimulus is not the purpose, just a short-term effect. The desired long-term effect is slightly above average local economic growth rates, which national economists often ignore.

Emergency or scrip currencies can endure, especially in situations where money supply is constrained due to economic and financial problems. Well-known examples include the issuance of around 400 scrip currencies in the aftermath of the Great Depression in the United States. These scrips were designed to counteract problems of limited money availability resulting from a combination of high unemployment, overproduction, a collapsing financial and credit system, large public and foreign debt levels, disorganised state agencies and loss of trust in the traditional monetary system (Mitchell and Shafer, 1984: 13-15). Historically 'emergency money' arises during economic and financial crises (cf. "notgeld", i.e. 'emergency money' in Germany), only to vanish in economic recovery, leaving very few schemes, such as the Swiss WIR (see box 8.1), to endure throughout cycles of boom and bust.

In recent decades new types of money have proliferated in small-scale community-based networks issuing their own forms of credit. In the UK, these networks can easily trace antecedents back to at least the 15th century. In some countries the modern equivalents are networks perhaps poised to grow substantially (Lietaer *et al*, 2010: 101), such as Germany's 'Chiemgauer' (Palmer and Colinson, 2011) founded in 2003 with 3,000 businesses in the network. These modern networks facilitate the exchange of skills, time or goods and services as well as credit among individuals, families, SMEs and local government agencies, in some instances with support or recognition from national governments[10]. Their multiple forms include mutual aid networks, time banks and local trade exchanges such as the British Local Exchange Trading Systems (LETS – see appendix 17); the French SEL (système d'échange local)[11] (which work

[10]For example, the Argentinian government has recognised the value of, and supports the promotion of "multireciprocal exchange of goods and services" throughout the country. See Thomas Greco, "The Development of Moneyless Exchange in Latin America", in *Globalisation, Money and Trade Workshop*, 2001, 21.

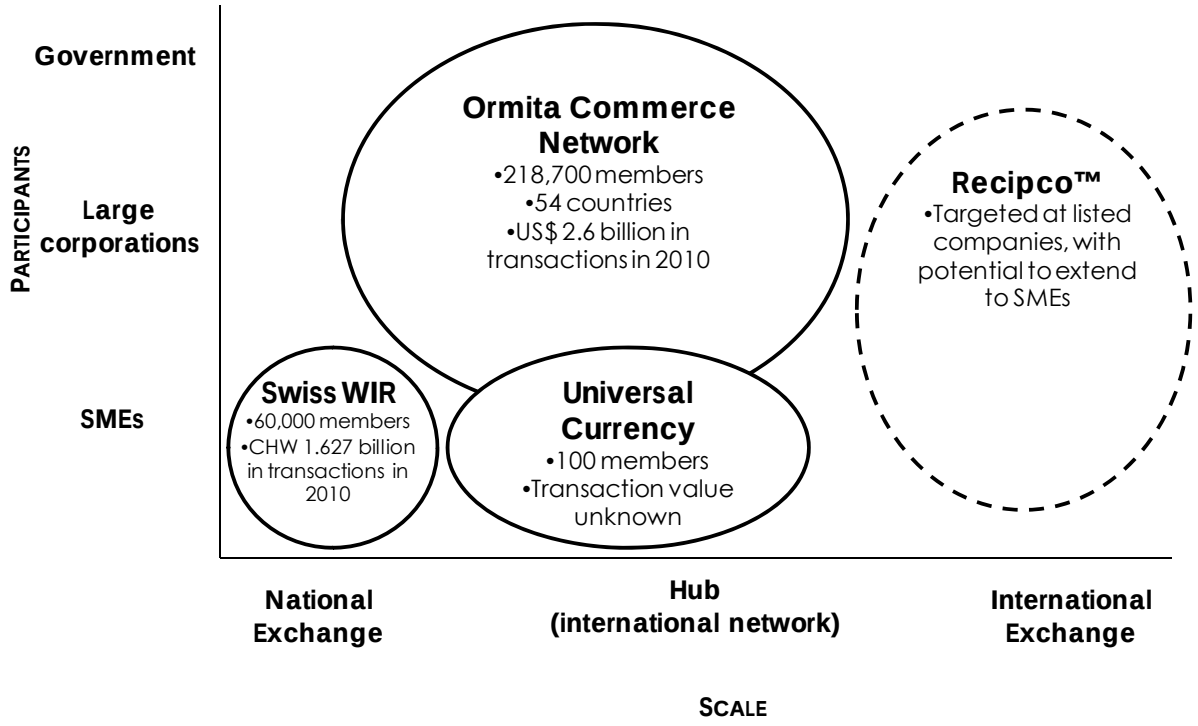
[11] See for example http://selidaire.org/spip/

similarly to the LETS); the Argentinean Global Trading Network of 'barter clubs'[12]; and Ithaca Hours[13] in New York. While differing in certain aspects, most of these social currencies share common features: they tend to be interest-free; they are issued by non-state, not-for-profit actors; and are based on trust among participants with strong community ties. Social currencies - usually in the form of credits - are issued independently of central banks and for exclusive use within the defined community scheme thus aiming to contribute to socio-economic development between members at a local level (Powell, 2002: 2).

2.3 Emerging architectures of trade

Figure 3.1 sketches the participants and scale of three existing multilateral reciprocal trading systems and one proposition which are explored in more detail in this report and which offer opportunities to foster economic growth and trade. The Swiss WIR is an extensive national SME system founded in 1934; the Ormita Commerce Network is a barter network founded in 2007; Universal Currency is a mechanism created in 1997 and using a common tender across a network of circa 100 local exchanges; and Recipco™[14] is a proposal for a multilateral capacity exchange focused on listed multinational companies with a mutual credit system backed by the members.

Figure 3.1 – Multilateral reciprocal trading landscape



Recent forms of multilateral reciprocal trade aiming to scale internationally (such as Universal Currency, Ormita and Recipco™) are taking advantage of developments in online technology which are discussed in more detail in the following section.

[12] For more information, see http://trueque.org.ar/
[13] For more information, see http://www.ithacahours.org/
[14] Note: Recipco™ is one of the sponsors of this report.

2.4 Technological developments

Recent decades have been characterised by tremendous innovation and technological developments in payment and information and communications technology (ICT), especially the widespread adoption of internet. Major developments include the introduction of electronic exchange of information (or electronic data interchange (EDI)), which has enabled faster transfer of information. Electronic transfer of funds (ETF) is another development that revolutionised payment mechanisms and wire transfers, led to telephone or internet payment mechanisms, and inspired electronic purses to manage payments instead of resorting to notes and coins (Kasturika, 2009).

Technological developments have changed the way the world functions in numerous ways, enabling greater interdependence among larger groups of people across greater distances, thus changing the global architecture of commerce. A noteworthy example might be the global acceptance of credit and debit cards, only half a century old, in the past couple of decades. By extension, this has drastically changed the way companies operate, both with their stakeholders and within their supply-chains. Virtually every organisation has a presence on the internet, uses the internet to display information on operations, products and services and increasingly enact commercial transactions, often in addition to 'brick and mortar' operations. Building on ICT developments, electronic commerce (e-commerce) has become a prominent feature of modern commerce. E-commerce, commonly defined as "commercial transactions occurring over open networks, such as the Internet" (OECD, 2011c), can be distinguished according to market structure - 'portals', 'market makers'[15] and 'product/service providers'; and the consumer base targeted, - Business-to-Consumers (B2C) or Business-to-Business (B2B) (Mahadevan, 2000: 5-9).

There is some degree of overlap and interdependency between the three market structures, but they also differ in important ways. Portals primarily build communities of people around information on products and services. They act as focal points for influencing traffic into websites managed by product/services providers and other intermediaries. Examples in the B2C segment include AOL and Yahoo, while portals such as Ariba[16] or Alibaba[17] serve the B2B segment. Market makers also build communities of consumers and suppliers.

Market makers differ from portals in that they facilitate the business transactions taking place between the buyer and the supplier and provide additional value to participants through a system offering some degree of security and trust in the business transaction. eBay can be considered an early market maker in B2C web-

[15] The term "market-maker" is used here in a literal sense to mean the maker of a new market. The use of the phrase here has a different meaning than its common in financial markets and in the sense of financial exchanges (see chapter 10, box 10.3).
[16] Ariba community takes different forms from collaborative commerce to knowledge sharing, including collaborative financing and innovation. For more information see http://www.ariba.com/community/
[17] Founded in 1999 in Hangzhou, China, Alibaba.com connects millions of buyers and suppliers around the world to do business online mainly through three marketplaces: a global trade platform (www.alibaba.com) for importers and exporters; a Chinese platform (www.1688.com) for domestic trade in China; and a transaction-based wholesale platform on the global site (www.aliexpress.com) geared for smaller buyers seeking fast shipment of small quantities of goods.

based auction sites. Examples in the B2B segment include ChemConnect[18] (chemicals) and HoustonStreet[19] (energy), where market makers take the form of auctions and reverse auctions, set up exchanges and provide product and/or service catalogue aggregation.

Product/service providers engage in sales directly with their consumers. In the B2C segment, Amazon is a well-known example for the online purchase of books and other products, although it has elements of 'market maker' in many areas. While some platforms are purely e-businesses (only present online), companies are increasingly using e-commerce to complement their brick and mortar selling channels (e.g. retail industry). Many companies focus on the B2B segment, including Cisco an ICT solutions provider for small and large companies and the Intercontinental Exchange (ICE) which uses an electronic trading platform to run futures exchanges (Mahadevan, 2000: 5-9; Lucking-Reiley and Spulber, 2000).

Praised for their convenience and ease of trading, as well as the variety of products and services, e-commerce platforms bring together huge numbers of buyers and sellers. They allow transactions to be automated and generate revenue by extracting fees on transactions and sometimes on membership. While upfront investment in software and design tends to be significant, e-commerce platforms can often be scaled up to huge capacity with minimal additional investment compared to offline operations (Kaplan and Sawhney, 2000). This ability to scale rapidly is due to the fractional marginal cost of replicating software and the global reach of the internet.

In the UK, e-commerce sales (for non-financial businesses) amounted to £408.3 billion in 2009, representing 16.7% of the value of all sales of UK non-financial businesses (Office for National Statistics, 2010). B2B transactions appear to account for the majority of e-commerce. In 2009, B2B e-commerce accounted for 91% of all e-commerce in the US, with 42% (US$1,862 billion) in manufacturing and 23.4% (US$1,211 billion) in wholesale trade (Office of Technology and Electronic Commerce, 2009: 1).

E-commerce is increasingly recognised as a driver of growth for both developed and developing countries. E-commerce enables large corporations as well as SMEs to expand operations, and demonstrate their contribution to the economy and employment levels. Governments have a growing interest in appropriate regulatory, fiscal and data protection framework developments (Office of Technology and Electronic Commerce, 2009). As a result many collaborative initiatives among governments and industry associations have emerged, often using international inter-governmental organisations and focusing on standards. Examples of such initiatives include the WTO Work Programme On Electronic Commerce established in 1998 to assess the impact of e-commerce and formulate recommendations around the treatment of e-commerce transactions[20]; policy discussions of the OECD as exemplified by a recent conference on the innovation and growth prospects of the

[18] ChemConnect helps chemical companies to optimise their supply chains by bringing together buyers and sellers using Collaboration Hubs and Negotiation Solutions. For more information see http://www.chemconnect.com/

[19] http://www.houstonstreet.com/

[20] For more information on the WTO work programme on electronic commerce, see http://www.wto.org/english/tratop_e/ecom_e/ecom_e.htm

internet economy (OECD, 2011a); and a call for coherent standards on e-commerce put forward by the UK industry association for e-retailing (Interactive Media in Retail Group, 2011).

With the development of internet technology, a number of private companies or ventures provided web-enabled trading platforms for member companies to trade goods and services with each other using 'trade credits' as a mean of exchange. These exchanges peaked during the dot.com boom and have since fallen away. Over 850 e-commerce and internet content companies were reported to have shut down in 2002 due to the dot.com bust (Chait, 2002); of these some were attempts to establish fully automated multilateral reciprocal trading e-platforms such as BigVine.com which failed 18 months after being launched despite significant investment from venture capitalists and backing from American Express (Flaherty, 2003).

2.5 Concluding remarks

Periods of economic crisis seem to correlate to the development of new types of money and new ways to access credit for businesses and individuals. One of the challenges for those proposing to extend and develop the application of capacity exchanges in the wider economy is to demonstrate their potential to play an enduring role to facilitate trade in any economic climate. The development of online technology and e-commerce offers significant opportunities for capacity exchange markets to span both time and space, as other electronic markets are doing. While ICT offers opportunities for increasingly sophisticated electronic trading platforms, previous attempts to build highly automated capacity exchanges have not proven successful.

3 Capacity

One of the proposed benefits of a capacity exchange is that it would allow companies and economies to use their capacity more efficiently than they currently do. This chapter explores the concept of capacity and assesses the extent to which capacity utilisation can be consistently and effectively measured. It attempts to distinguish between different types of capacity – including excess and overcapacity – in order to understand the potential for a capacity exchange to reduce them.

3.1 Concept definition

'Capacity' in economics refers to the total potential output of an economy given its existing resource endowment. 'Capacity utilisation' measures the extent to which a nation's productive resources are fully used. It describes the gap between what an economy is actually producing compared with what it could produce (Shaikh and Moudud, 2004).

Capacity of a firm has been defined as "the highest quantity of output possible in a given time period with a predefined level of staffing, facilities and equipment. Perishability is a central factor in capacity, as for each day a service is not put to profitable use, it cannot be saved" (Ng et al, 1999).

3.2 Defining capacity utilisation

In defining capacity utilisation, it is normal to distinguish between physical or 'engineering capacity' and 'economic capacity'. Engineering capacity is the maximum output that can be obtained when an economy's production facilities – its capital stock - are fully utilised (Shaikh and Moudud, 2004). Economic capacity is the level of output that is produced when businesses are working at a normal or planned level of activity with their given level of capital. While engineering capacity, in the extreme, is the output achieved by running a plant for up to 24 hours a day and 365 days a year, economic capacity will yield a much lower output for any given level of capital. This is because economic capacity is defined as the output that companies want to produce from their capital stock. Economic capacity can be seen as an equilibrium or optimal rate that companies would plan to operate at where they do not run into supply shortages on the one hand or incur escalating unit costs on the other hand.

3.3 Measuring capacity utilisation

The main interest for most economists in measuring capacity utilisation is as an indicator of inflationary pressures within an economy and to influence the execution of fiscal and monetary policy (Nickell, 2005; H. M. Treasury, 2010). If an economy is running below capacity, the assumption is that deflationary forces are at work in the system. Traditional economic policy in such circumstances favours expansion and assumes a limited risk of fuelling inflation. At higher levels of capacity utilisation the risks of inflation grow and may prompt deflationary policy measures.

Rates of utilisation of 80% to 85% are cited as being the threshold beyond which an economy will start to experience upward pressures on costs and wage rates that will feed through to inflation (Shaikh and Moudud, 2004). At first sight that might appear a rather low figure for utilisation. The reason for such a low threshold figure is that when aggregate utilisation exceeds 80% to 85%, there will be several key industries that are operating at maximum capacity, or even beyond, and so there will be

inflationary pressures building up in the system, even if many businesses are operating with a significant degree of spare capacity. Another reason for a 15% to 20% gap from the theoretical maximum is that economies are in a state of creative destruction. In addition, the theoretical maximum takes no account of unusual circumstances, e.g. storms, floods, earthquakes. Finally, the theoretical maximum is typically calculated, understandably given the complexity, with little reference to the underlying engineering capacity.

The preceding discussion implies that there is a trade-off between having capacity at too low a level, with the attendant deflation and relatively low output, and at too high a level, with the attendant inflation. There will thus be an optimal level of capacity utilisation which is below 100%. Other factors may determine the optimal capacity utilisation in an economy, including the benefit of keeping some excess capacity to deal with unexpected shocks. So, although an economy may not technically be operating at full capacity utilisation (i.e. 100%), it does not follow that it is not, in fact, operating at the optimal level, in which case reducing excess capacity may prove to be disadvantageous. While it may be that many economies are currently at a sub-optimal level of capacity utilisation, following the recent financial crises, it is important to assess the extent of the excess capacity problem against an optimal capacity utilisation rate, rather than a maximum rate.

Such an assessment, however, requires some measure of what is the optimal rate. The output gap is a measure which indicates how far an economy's current output is below what it would be at full capacity. It is expressed as a percentage of potential gross domestic product (GDP). According to the WTO, "a negative output gap of 5 percent is analogous to a positive 5 percent level of spare capacity, except that the first measure refers to the whole economy and the second only to the industrial sector" (WTO, 2011: 38). Based on this measure the WTO asserts that, as of October 2010, there remains 8.3% and 9.8% of spare capacity in the United States and the Euro Area respectively (WTO, 2011: 36).

The output gap is used by the International Monetary Fund (IMF) to provide policy recommendations to member country governments; and it is used by the European Commission to calculate cyclical adjustments in the budget of European Union Member States (Planas et al, 2010). Despite the use of the output gap to indicate levels of capacity utilisation, and correspondingly to define monetary policy and budget levels, it is acknowledged that "although they represent clear concepts, potential output and the output gap are unobservable in practice. They cannot be easily embedded in robust and unquestionable quantitative indicators. Estimates of potential output and the output gap are known to be particularly uncertain, as different approaches provide estimates which may differ significantly from each other" (Economic Policy Committee, 2011: 1).

While there is no universal measure across industries or economies, in the USA capacity utilisation rates in manufacturing production are assessed by both the Federal Reserve Board (FRB) and the Institute for Supply Management (ISM). The FRB runs a survey of plant capacity in the USA to construct an index which estimates capacity utilisation for industries in manufacturing, mining, electric and gas utilities. The index attempts to capture "the concept of *sustainable maximum output* - the greatest level of output a plant can maintain within the framework of a realistic work schedule, after factoring in normal downtime and assuming sufficient availability of

inputs to operate the capital in place" (Federal Reserve Board, 2011). The ISM survey requires respondents to measure their current output relative to 'normal capacity'. The two different approaches often produce different results, although there is an argument to suggest that these percentage point differences are not as significant as they might appear (Morin and Stevens, 2005).

Other surveys include the Global Capacity Utilization survey which is based on the responses of approximately 11,000 companies. In spring 2011 the results of this survey indicated a positive outlook, with all respondents anticipating a rise in capacity utilisation, and those in electrical and optical goods expecting the sharpest increase (KPMG, 2011). Ultimately, however, "the extent of spare industrial capacity is only a partial and limited measure of slack in an economy, where in many countries the majority of employment and GDP is in the services and agricultural sectors" (WTO, 2011: 37).

While the IMF, FRB and ISM methods attempt to assess the productive capacity of industry sectors within industrialised nations, there are fewer indicators of capacity utilisation in developing countries, owing largely to the lack of reliable data (De Masi, 1997). For example, 75% of the WTO monthly industrial production data for Sub-Saharan Africa is for Nigeria and South Africa (WTO, 2011: 37). So although indices and measures do exist – and are well developed for the manufacturing sector of some developed economies – a comprehensive global understanding of capacity utilisation at an industry level and at an economy level remains elusive.

3.4 Addressing the capacity problem

Excess and overcapacity are two distinct concepts. Excess capacity is "a short run phenomenon that occurs when a firm produces less than it could under normal operating conditions because of a change in market conditions for input costs [and] output prices" (Food and Agriculture Organisation, 2002: 1). Overcapacity is "a long run phenomenon that exists when the potential output that could exist under normal operating conditions is different from a target level of production" (Food and Agriculture Organisation, 2002: 1). The implications of each are related to both supply and demand, and levels of competition.

From a micro economic perspective there are a range of reasons that explain the presence of chronic overcapacity which are embedded in the structural and institutional specifics of an economy (McCombie, 2000-2001; Coelli, Grifell-Tatje and Perelman, 2002). First, there may be rigidities in the supply chain (Crotty, 2002a). Where there is a well-established supply chain providing intermediate products and services to end users, unexpected demand variations might be difficult to accommodate where supply conditions are 'sticky' and the sector will have a position of unused capacity. For example, if a car manufacturer requires fewer components at short notice than expected, the supplier might be able to reduce output but will still have a degree of unused or spare capacity in the plant that could otherwise be used.

Second, where markets are highly localised or regionalised, there are likely to be periods of demand variation when suppliers are unable to use all of their capacity yet they wish to maintain their capital levels in order to meet periods of higher demand (Erumban, 2005). This will create a short-term period of unused capacity.

Third, markets might be subject to tariff or other forms of protection from external competitors (Erumban, 2005). Protectionism exists in developed economies and is certainly found in many high-growth emerging economies where domestic protection has often been credited with their growth and development. Domestic protection frequently creates incentives for domestic companies to invest too much in capacity because of the lack of external competition.

Fourth, companies may operate at higher capacity levels than indicated by the market in order to create barriers to entry to new entrants. Crotty (2002a) in particular notes the irony of this phenomenon, that as globalisation has proceeded it may have brought down average costs for many products but has also seen the emergence of global oligopolies that protect their dominant positions by investing in capacity beyond the pure economic needs of their markets. Crotty acknowledges that there is no official global data on excess capacity, nor any consensus on how it should be defined or measured, but draws attention to "the generation and continued reproduction of substantial excess capacity in the most important globally contested industries" (Crotty, 2002b).

Finally, a product, service or industry may be in decline due to innovation. Measures that address specific causes of underused capacity, and which improve the average level of capacity utilisation of individual companies, will have the effect of increasing the level of aggregate capacity utilisation that is consistent with a non-inflationary rate of economic growth. But what kind of measures might be successful?

Rigidities in the supply chain, or markets that are geographically highly localised or regionalised, can lead to temporary situations of spare capacity for companies. Companies are influenced by a combination of unexpected variations in demand and some supply side rigidities. In the European Union, capacity under-utilisation can be quite pronounced and increasing capacity utilisation was one of the theoretical drivers behind creating a single European market. The idea was that by creating much wider markets for goods and services, suppliers could manage their capacity much more efficiently as different markets would exhibit different patterns of demand at any one time. Indeed there is evidence that EU markets have both improved their average level of utilisation over the last two decades and also that short term mismatches of capacity and demand have been more effectively managed, an improvement in part related to the theoretical mechanisms envisaged in the creation of the single market.

A capacity exchange might yield economic and social benefits by extending markets through trade facilitation. Such an exchange can provide a mechanism by which companies can find secure and reliable access to alternative users that are outside of their regular market place. Given the universality of modern ICT technologies and products or services that can be shipped at relatively low cost, this route could replicate some of the single market benefits in a global context. Overcoming rigidities and extending markets takes advantage of 'spare capacity', i.e. capacity which is unused in the short term for various reasons and which can be opportunistically transferred elsewhere. There are some interesting effects of opportunistic transfers. These transactions can from time to time establish enduring connections that open longer-term markets. Even transient increased capacity

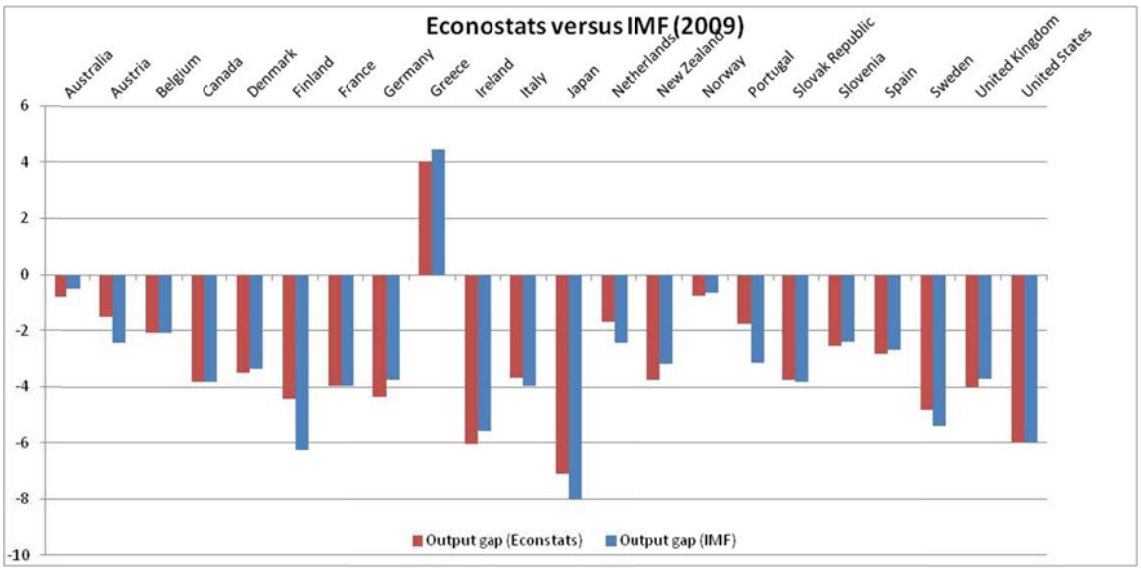
utilisation permits unit price reductions which in turn adjust the supply and demand curves towards greater production.

Markets in which excess capacity might be used as a barrier to entry to competitors, or where market participants are subject to tariffs or other forms of protection, can also improve capacity utilisation. If, for example, an economy is made more open to international trade then consumers will benefit from the competitive pressures that the trade unleashes. In a similar way, there will be economic and social benefits in reducing the dominance of oligopolies where they exert their powers in ways that offset the scale benefits they might create for the market and consumers. The policies and measures that unlock these benefits are national government actions towards free trade and competition. Capacity exchange platforms may hasten and facilitate the process of opening up the competitive landscape in two ways. The first is to enable access to these newly liberalised markets for companies outside of the protected economies. The second is the reverse, giving companies from the protected economies access to new external markets.

3.5 Output Gap analysis

Nationally, various countries have significant unused economic capacity. The USA's capacity utilisation in June 2011, for example, was 76.7%, implying significant room for improvement (US Federal Reserve, 2011). Still, many economic observers use the output gap to estimate whether or not an economy is "overheating" (above output trend) or "cooling" below output trend, and often use a "second derivative" function, i.e. the change in the rate of trend change. To provide a flavour of contemporary figures:

Figure 4.1 – 2009 Output gap as % of GDP contrasting 2009 estimates of Econstats and IMF



Without entering into detailed analysis distinguishing output gaps and capacity utilisation, figure 4.1 indicates that efficient utilisation could increase UK GDP by over 3% while USA GDP could increase by nearly 6%. If capacity exchanges could contribute even a fraction of that improvement, then compound effects to wealth could be enormous. The chart also shows that Greece is "overheated".

However, saying that there is a deviation in trend is insufficient for policy formulation. One area of historic and continuing research is trying to correlate and find leading indicators of trends market-by-market and for economies as a whole. In order to ascertain the difficulties in identifying these leading indicators, the research team compiled economic indicators for 37 countries contrasting 2005 and 2009 economic status as input variables to a model. The 31 input variables covered multi-factor growth, the most important ones being growth over the period 2005 to 2009 of gross fixed capital; value added in services; value added in agriculture; valued added in manufacturing; energy production; energy consumption per unit of GDP; and energy consumption per capita. Complete, comparable information was obtained for 22 countries. There were two target variables: Econstats and IMF estimates of output gap. A correlation matrix showed no significant correlation for any single variable among the output gap targets and the indicators. An instrumental factor analysis of the input and target variables for the 22 countries was able to identify that multi-factor analysis has some predictive capacity, as outlined in Figure 4.2 for Econstats (Econstats, n.d.) output gaps and Figure 4.3 for IMF (IMF, n.d.) output gaps:

Figure 4.2 – Econstats estimates of output gap contrasted with instrumental factor analysis

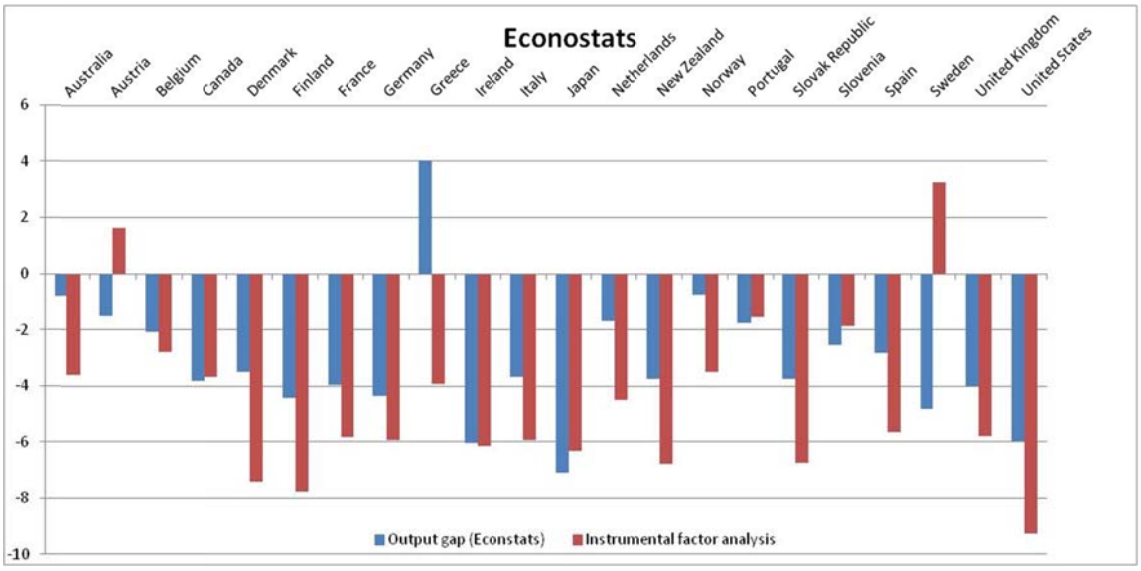
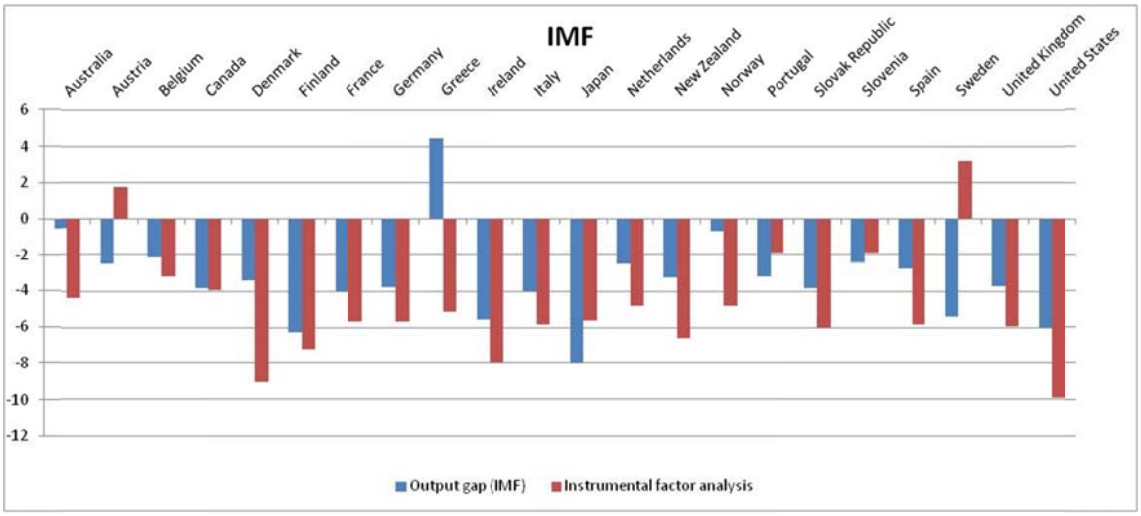


Figure 4.3 – IMF estimates of output gap contrasted with instrumental factor analysis



The above figures contrast the output gap from Econstats and the IMF with the output gap as estimated by the multi-factor model using a support vector approach. The model shows that combinations of input factors do relate to output gap estimates in broad terms. While the instrumental factor analysis was unable to produce a strongly correlated model, non-parametrically it identified three outliers, Greece, Sweden and Denmark. In the case of Greece it did not indicate that the Greek economy was overheated. The model also indicated that Sweden and Austria might be overheated where, in contrast, Econstats and the IMF believe both economies have output gaps. Finally, the model appeared to indicate that Denmark, in particular, could improve performance markedly. Overall the multi-factor model supported both Econstats and IMF estimates, but shows that strict correlations between input factors and GDP are far off.

3.6 Why trade?

Capacity is the capability of a firm to provide 'goods, services and infrastructure'. Capacity therefore refers not only to productive capacity but also, for example, to inventory, marginal production or alternative infrastructure use. Alternative infrastructure use might be using the electricity distribution system for data or timing, allowing telecommunications providers to use railway wayleaves or sharing computing capacity during different time periods.

There are a range of reasons why firms may have unused or excess capacity. Variations in these reasons can affect a firm's willingness to trade that unused or excess capacity. In some industries, with high fixed costs, sizeable economies of scale, and a relatively small number of producing firms, there is an argument that excess capacity can be used as a barrier to entry for potential competitors, in which case the excess capacity is of strategic use and there will not necessarily be any motivation to trade it (Lieberman, 1987).

Figure 4.4 – Taxonomy of trade motivation and capacity

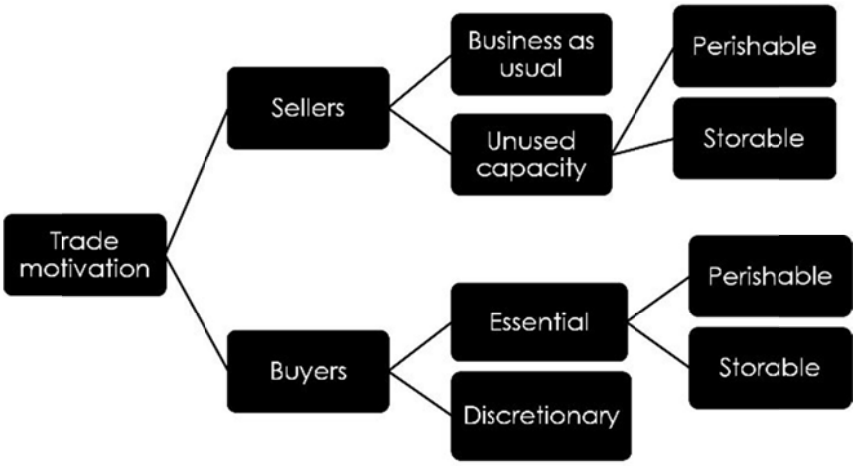


Figure 4.4 maps out the potential motivations behind the trade of capacity and attempts to identify the different motivations to trade of buyers and sellers. For sellers, 'business as usual' trading and 'unused capacity' trading are identified. There are broadly two types of unused capacity – storable (such as commodities) and perishable (anything with an expiry date including airline seats and hotel rooms). Motivations to trade each of these will, of course, be very different and relate to the market structure of the specific industry (Esposito and Esposito, 1974).

For buyers, two broad types of capacity are identified – essential and discretionary. Essential demand is that where a purchaser requires the input in the course of conducting business. An example might be milk for a dairy producer. Discretionary demand is where a purchaser does not require an input, for example, the same dairy producer may readily forego advertising. During the research, procurement executives clearly distinguished essential from discretionary demands, indicating that they placed a premium on security of supply and chain of custody, i.e. making sure their own facilities did not cease to function for lack of inputs and making sure they knew the sources of inputs.

3.7 Implications for a capacity exchange

Capacity utilisation at a macroeconomic level is difficult to measure comprehensively but existing indicators suggest that both developed and developing countries experience 'slack' in their economies which could be reduced by better capacity management. Since it appears unclear, however, what the optimal capacity utilisation level within a particular economy should be, it is not certain that this slack should necessarily be interpreted as available for long-term use. From a microeconomic perspective, industry sectors manage capacity fluctuations according to their particular products and markets. Industries characterised by 'perishable' products in particular have made concerted efforts in the past three decades to manage their capacity better and have benefitted from advances in internet technology to do so. No company operates at full capacity and there is always interest in new markets or ways of trading that could contribute to increased efficiency and competitiveness.

4 Trade

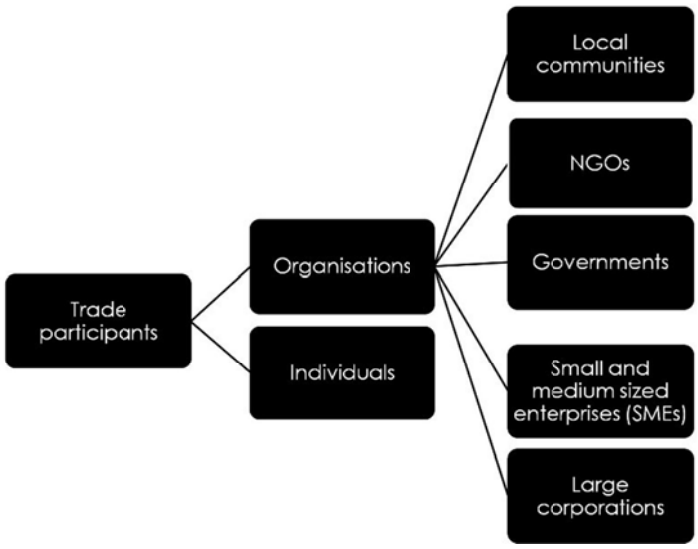
Trade underpins economic development and growth. Proponents of multilateral reciprocal trade suggest that trade can be increased by participation on a capacity exchange where each member's purchase is theoretically matched with a sale to another member. The dynamics of how and why people trade is discussed here in order to help elucidate motivations to participate in a capacity exchange, and who are the likely early adopters.

4.1 Concept definition

Trade is generally understood as the buying and selling of goods, services and infrastructure between two or more parties, either individuals or organisations, within and across countries. Trade enables access to a wider range of goods and services than one could possibly produce on one's own and, when well-managed, can support the economic growth of a country or community.

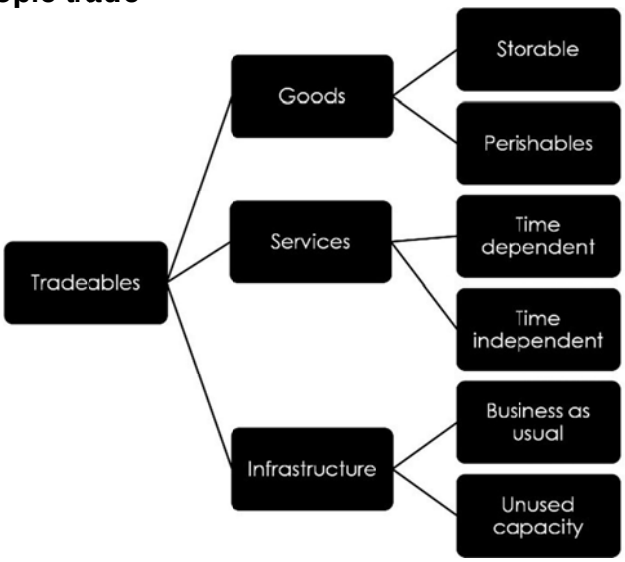
4.2 Who trades what

Figure 5.1 – Trade participants



In terms of participation in international trade from OECD countries, large corporations generally account for the majority of exports – from 28% (e.g. Iceland) to 70% (e.g. Finland, USA) of all exports, depending on the country. Partly because of the importance of economies of scale and fixed costs in exporting, SMEs, despite their preponderance in many developed economies, account for a smaller relative share of exports – from 7% (e.g. USA, Finland) to 48% (e.g. Belgium) (OECD, 2009).

Figure 5.2 – What people trade



Infrastructure capacity is often installed for long periods ahead, for example unused fibre optic cable ('dark' fibre) laid to handle 10 years of growth. However, it would be an unusual business that wouldn't sell such capacity, well above estimated usage, if there were an opportunity. Many companies view unused capacity as 'unsellable' goods or services. This leads, somewhat circuitously, back to whether or not these goods or services are being produced in excess of demand in the first place.

No organisation during the course of the research claimed that they were operating at full capacity all the time, which might suggest that there is an optimal amount of excess capacity at the individual firm level. All organisations were interested in how they might be able to realise value from unused capacity. In practice many companies do not distinguish unused capacity from day-to-day business as usual. Some view unused capacity as unsellable capacity, and are willing to offload it at a significant discount as long as it can be done discreetly, so as to avoid damaging their brands or revealing pricing weaknesses.

4.3 Trade facilitators

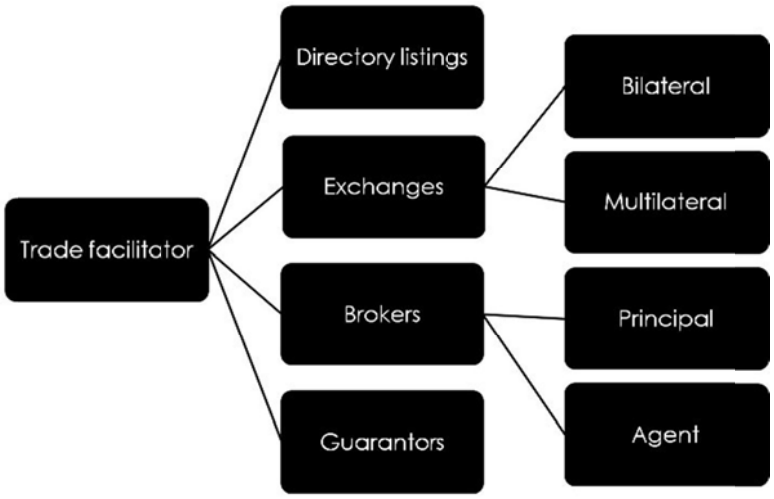
Historically, trade participants have tended to meet in person to arrange and fulfil trade contracts. In London for example, from 1565 the Royal Exchange served as a marketplace where merchants could meet and agree trade contracts for a variety of goods or services. Over time, technological and structural developments have brought forth numerous trade facilitators, distance trading and new marketplaces.

While there is no standard definition, taken narrowly, trade facilitation comprises efforts to ease or fulfil the logistics of moving what is being traded as well as related documentation associated with international trade (e.g. customs, technical regulations and quality control inspections documents). In light of the technological and structural developments of recent decades, contemporary academics suggest that trade facilitation should be broadened to include the environment within which trade transactions take place as well as regulatory frameworks or legal systems at national and international levels (see Wilson *et al*, 2004). Overall trade facilitation helps to minimise the transaction costs and complexity of trade for businesses, while

maintaining efficient and effective levels of government control. Thus, it often contributes to export growth, improved competitiveness in the global market, improved access to foreign direct investments and increased participation of SMEs in international trade (UNESCAP, 2002).

Trade facilitation has become increasingly associated with the development of e-commerce marketplaces (UNESCAP, 2002). Figure 5.3 outlines simplified forms of trade facilitation relevant to trading on e-marketplaces and associated fora for B2B commerce.

Figure 5.3 – Trade facilitators



There are at least four types of trade facilitator:

- **Directory listings** - which compile business information including companies' contact details and sometimes even product categories (Yellow Pages is an early example). Originally displayed in paper-format these tend to be increasingly web-based, enabling faster updating to ensure an accurate display of information;
- **Exchanges** - fora where goods, services and infrastructure can be exchanged. These can either facilitate bilateral trade or provide a space for multilateral trade to take place. Exchanges can be product- or industry- specific, with varying degrees of structural complexity and are often supported by computing technology;
- **Brokers** – individuals or firms which act as an intermediary between buyers and sellers, usually charging a commission on the transaction. A broker can either act as a 'principal' (meaning he or she takes a position in the trade); or as an 'agent' (who takes a commission but not a position in the trade).
- **Guarantors** – who insure or re-insure project or corporate operations and risk (von Gunten and Cooper, 2011). Some markets may use a central counter-party, an entity which mitigates transaction risks and guarantees the performance of a transaction by acting as a matching seller to the buyer and a matching buyer to the seller (OECD, 2011c).

4.4 Benefits of trade

Trade offers a range of benefits as opposed to in-house production through economic gains, greater specialisation, time and resource efficiency, cost effectiveness and innovation. Figure 5.4 details how these benefits can arise across time, space, production function and resource use in production.

Figure 5.4 – Benefits of trade versus in-house production

	Time	Place	Function	Resource Consumption
Economy	time reduction	fewer geographical sites or travel	fewer steps	less material or time
Efficiency	greater throughput per period	load balancing geographically	load balancing between functions	more output for given inputs
Effectiveness	on time for customer	right place	correctly performed	most appropriate
Innovation	radical time change	unexpected location	elimination or automation	elimination

Economic theory distinguishes between static and dynamic gains from trade, especially in the context of international trade and as opposed to self-sufficiency at country level. Static gains from trade comprise efficiency gains arising from specialisation according to comparative advantage across countries; benefits arising from economies of scale achieved through increased specialisation and better allocation of resources; and the increased choice of goods and services available through trade. Dynamic gains are usually defined as benefits in terms of welfare and economic growth as trade enhances competition and stimulates international labour and technology transfer (Finger and Schuknecht, 1999).

4.5 Recent trends in international trade

In recent decades, profound changes have increased the volume and diversity of trade. Globalisation has led countries to open their economies to international trade, which in turn has increased specialisation, efficiency of production and the ranges of goods and services (WTO, 2008). Through globalisation and trade, countries have become increasingly interdependent. Global trade grew from around 40% of world GDP in 1992, to circa 50% in 2009, half of which is in merchandise (Love and Lattimore, 2009: 2). In 2010, for example, world merchandise exports accounted for over US$15.24 trillion (WTO, 2011b: 24).

Countries have an obvious interest in managing trade development in a way that is beneficial to their economy. At the international level, collaborative efforts between countries through institutional arrangements such as the World Trade Organisation[21] have led to the liberalisation of multilateral trade. These collaborations have reduced trade discrimination between countries in the form of taxes, quotas and bans on imports. Equally, regional institutional arrangements (such as the European Union) and regional trade agreements (such as North-

[21] http://www.wto.org

America Free Trade Agreement (NAFTA) between the USA, Canada and Mexico) have also contributed to increasing multilateral trade.

Trade influences innovation through increased competitiveness, technological transfer and the rise of intra-industry trade (OECD, n.d.). By lowering transaction costs, e-commerce has enabled more distance trading, increased trade efficiencies and widened the range of trading opportunities globally. ICT developments have not only led to the emergence of ICT-enabled marketplaces such as e-marketplaces (virtual trading hubs) but also to ICT-focused trade exchanges such as telecommunications bandwidth or cloud computing exchanges.

One trend over the past few decades, a natural consequence of globalisation, has been the development of more complex and more sensitive supply chains. Procurement executives have pursued management approaches such as 'just-in-time' processing, i.e. reducing in-process inventory, or 'lean production' techniques. Just-in-time approaches have numerous financial benefits, and can increase production flexibility, but at a cost. The resulting supply chain can often be 'brittle', i.e. very sensitive to supply shocks. In 2011 the tsunami and subsequent nuclear disasters in Japan disrupted just-in-time supply chains. 'Just-in-case' supply chains are the current trend, emphasising the need to have buffer supplies and reserves in order to improve supply-chain resilience (The Economist, 2011a) and implying again that some amount of excess capacity may be optimal. A move to just-in-case could encourage capacity exchanges as there is more openness to diversification of supply and more flexibility in time, since trading via a capacity exchange may lead to more diversification of supply than is available via other forms of trade. Equally, such a trend could mean that firms with long supply chains would prefer deeper contractual relationships rather than transient exchange transactions.

4.6 Implications for a capacity exchange

Trade is carried out through a variety of channels, both formal and informal. It is facilitated in numerous ways through formalised exchanges, third party brokers, government intervention and, more recently, through online platforms. A capacity exchange that allows organisations to access new trading channels and partners, and therefore increase trading opportunities, could foster more socio-economic benefits that come through trade. Given the increasing complexity and sensitivity of supply-chains within industry, a capacity exchange that might contribute to the management of demand shocks and improve supply-chain efficiencies could be particularly attractive.

Conventional trade, defined as the buying and selling of goods and services using an agreed sovereign currency as the means of payment to settle the trade, accounts for the majority of trade in a cash-based world. Trade is intimately linked to finance.

> "From a 'real-economy', or barter exchange, perspective it might seem that any growth of demand has to be based on a corresponding growth of supply. For if a new demand for a certain set of goods is to be effective in real terms, there must be an expanded supply of some other goods with which to pay for the newly demanded set. Explaining the growth of supply has therefore seemed adequate. But this is a way of thinking that overlooks the role of finance. Finance breaks the link between demanding one set of goods and paying for them with another; once finance is in the picture, goods can be demanded even if the other goods needed to pay for them have not yet been produced. With finance, growth of demand can be separated from the growth of supply" (Nell and Smith, 2001: 1).

This might be read as an argument against the need for a capacity exchange, since such a platform is ostensibly designed for the exchange of goods and services directly for other goods and services. The role of a medium of exchange – a common tender - on a capacity exchange is therefore of significance in assessing and understanding the functionality of a capacity exchange and its contribution to the economy. It is the presence of common tender that allows capacity exchanges to act as a potential source of credit. The following chapter will consider existing financing sources and functions in order to assess the extent to which such an alternative credit source is needed to develop commerce and growth.

5 Credit

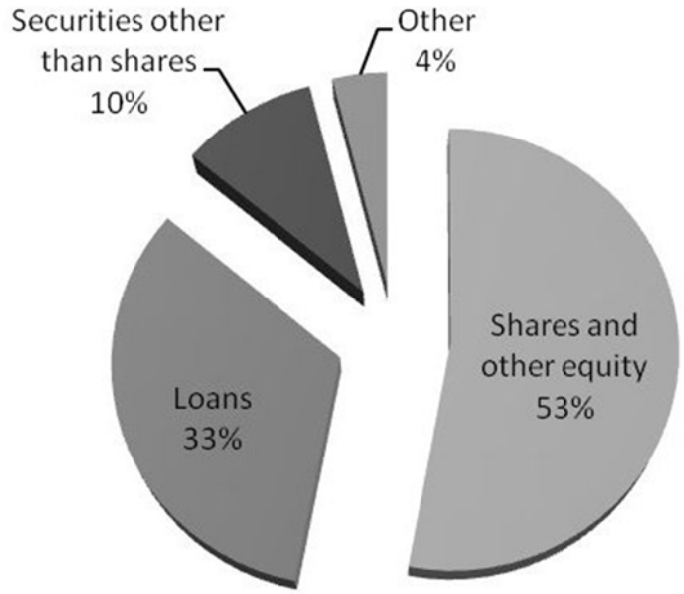
The principal innovation underpinning the concept of multilateral reciprocal trade is that it can reduce the need for businesses to seek conventional financial credit. By using their own goods and services (their productive capacity) to finance the purchase of other goods and services, without the use of sovereign currency, businesses could conserve cash and reduce the need for credit. This chapter explores the need for credit in trade, the various ways in which it is provided and the extent to which limits in credit provision may make multilateral reciprocal trading attractive to traders.

5.1 Concept definition

"Credit is a claim on goods and services, or alternatively, the promise to pay cash, goods or services" (Moore, 1984). Credit is a complex, multi-layered concept. Core to the concept of credit is an obligation deferred in time arising from an exchange. As money is a common medium of exchange, money and credit are intertwined. Credit must be recorded and the obligation held over time; credit is therefore characterised by two characteristics of money: a unit of account and a store of value.

The financial sector plays a key role in providing credit, by checking credit-worthiness of borrowers, by spreading the risk of default over a large number of transactions and by reducing transaction costs and information asymmetry issues at a lower cost and risk than individual lenders could possibly do. Financial intermediaries are essential in an efficient financial system to ensure that savers are paid a risk-adjusted interest rate and to enable access to affordable credit that is tailored to borrowers' needs (Finger and Schuknecht, 1999). To provide some background on UK funding, figure 6.1 shows the importance of equity and loans to non-financial corporates, over 86% of the total funding.

Figure 6.1 – UK non-financial corporate sector sources of funding



Source – IMF, 2011a

5.2 Credit and capacity – working capital finance

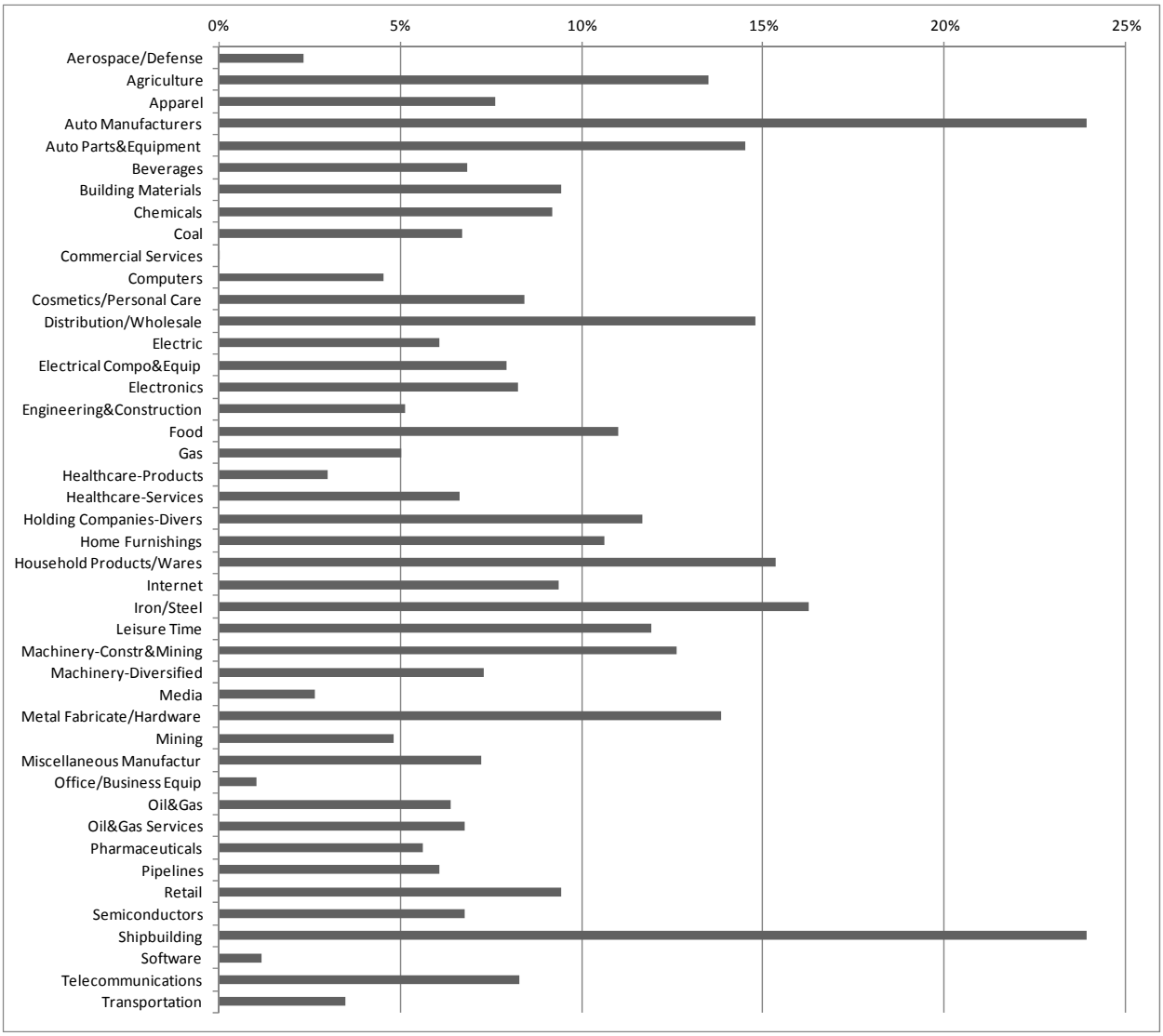
Companies need credit to finance investments in assets relating to their operations, both in the short term (cyclical working capital) and in the long term (permanent working capital). Often termed the "lifeblood of companies" (Seidman, 2005: 92), working capital finance is primarily used to:

- provide the on-going investment in short-term assets that a company needs to operate. These include the minimum cash balance to meet day-to-day expenses; and reserves to cover unexpected costs and to meet prepaid costs such as licenses, insurance policies or security deposits;
- address seasonal or cyclical financing needs, for example, to support the build-up of short-term assets needed to generate revenue i.e. to finance the purchase, production, sales and collection costs of goods prior to receiving payment from customers;
- sustain a company's growth in terms of new facilities and equipment but also to support sales growth;
- improve business operations to ensure competitiveness, including product development and production process improvements (Seidman, 2005: 92-93).

Companies can raise capital through equity, where investors provide capital in exchange for a share of profits, and through debt, where interest is paid by the borrower to the lender. Large corporations enjoy access to capital markets and rely significantly on syndicated loans and corporate bonds to finance their working capital needs and investments. Smaller firms, on the contrary, are usually characterised by low capitalisation and, while often primarily equity financed, have an over-reliance on debt over equity (European Central Bank, 2009; Potter and Thompson, 2011: 145-159).

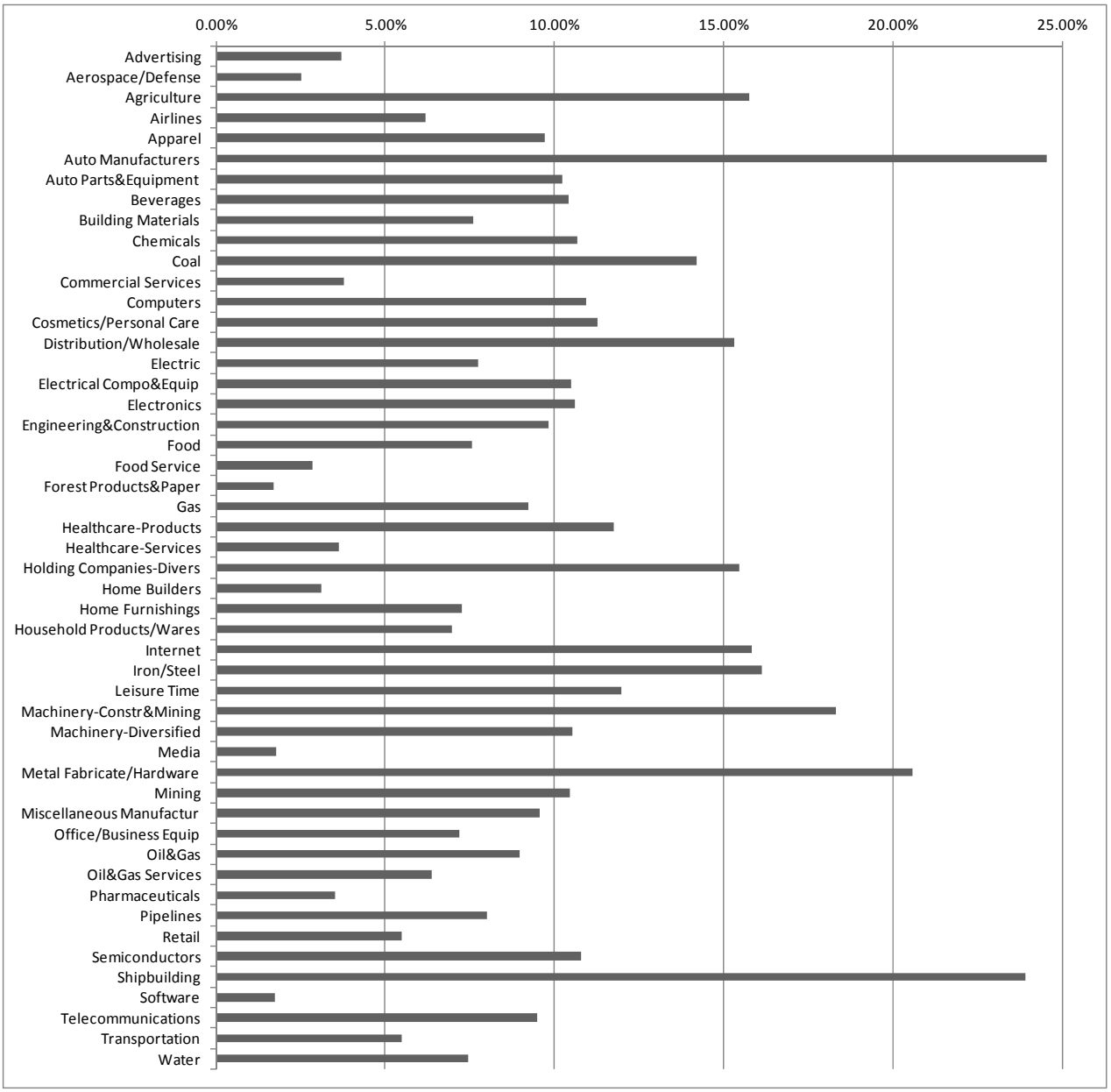
However, the use of short-term borrowing varies markedly by industry, from 1% of total liabilities in aerospace and defence to 20% in the automobile industry. In order to gain a better understanding of industries that might be more capable of using new forms of trade credit, this project gathered data on the percentage of short-term borrowing out of total liabilities undertaken by the top 500 global companies by market capitalisation (figure 6.2) and by the top 500 global companies by turnover (figure 6.3):

Figure 6.2 – Short-term borrowing as % of total liabilities – non-financial firms by market capitalisation



Source: Bloomberg

Figure 6.3 – Short-term borrowing as % of total liabilities – non-financial firms by turnover



Source: Bloomberg

Excluding financial services firms (e.g. banks, insurers, real estate investment trusts) the sectors most likely to be able to expand their use of short-term borrowing, perhaps via trade credit, would have a low ratio of short-term borrowings as a percentage of total liabilities. Taking less than 5% of total liabilities in short-term borrowing as a threshold - and excluding mining and oil equipment/services on the basis that these contain numerous speculative ventures, support services as a 'catch-all' and tobacco as unique - the remaining categories would appear to have significant, potential unused short-term credit, these being aerospace/defence, food/drug retailers, utilities, general retailers, healthcare,

industrial transport, leisure goods and media. Another interpretation of this data, might suggest that it is, in fact, the sectors with the largest relative amounts of short-term borrowing that are the most likely to be looking for ways to diversify their sources of short-term borrowing. These sectors may be particularly attracted to the capacity exchange concept, since it offers an alternative source of credit to traditional financing routes by allowing companies to purchase goods and services with their own productive capacity, rather than with cash.

A firm is built on its ability to contract credibly on its future capacity to produce. Equity and debt securities form such a contract on future production, as do, for example, unfunded or partially funded employee pensions (deferred salary based on future production) and trade credit. Insolvency and bad faith constitute the two primary time inconsistencies in these contracts. "Investment is concerned with the collection of productive returns, while speculation is concerned with the collection of price changes."[22] One might consider the distinction between a merchant and a gambler to be based on this distinction between focusing on future productive returns versus focusing on future price changes. Clearly, there are many cases of mixed motivations – productive returns and price changes – but the distinction is useful.

Holmström and Tirole start their work on liquidity by assuming that "some part of a firm's income stream cannot be promised or pledged to investors" (Holmström and Tirole, 2011: 2). They point out that an ability to increase "pledgeable income" increases liquidity as liquidity is based on "the extent to which corporate income and private wealth are turned into tradable assets" (Holmströle and Tirole, 2011: 117).

> [T]he wedge between total returns and pledgeable returns on investments can create a shortage of instruments for transferring wealth from one period to the next and thereby make it more costly, or even impossible, for firms to insure against future liquidity shocks through credit lines of other forms of advance funding" (Holmströle and Tirole, 2011: 117).

Government plays a major role in credit provision through the monetary system because "its unique access to current and future consumer income through taxation allows it to act as an intermediary between consumers and firms. It can raise welfare by transferring liquidity from consumers (current and future) to firms in states where the value of such transaction is higher than the shadow cost of public funds" (Holmströle and Tirole, 2011: 229). By implication, if pledgeable income can be created then aggregate liquidity can rise. This leads to a consideration of how a capacity exchange could transform trade credit into pledgeable income. If that pledgeable income is additional to government credit, then the overall system will be more diversified and possibly more resilient so long as the marginal cost of credit (including additional transaction cost) does not rise - a 'shadow banking system' of a form, but one based on trade credit rather than money market funds or mortgage portfolios. In essence, capacity exchanges can provide an additional source of credit to traditional credit providers, a diversification which may lead to greater resilience within an economy.

[22] Con Keating, in conversation, September 2011.

Trade credit is intimately entwined with working capital in most firms. Working capital finance takes varying forms with differing advantages and constraints for borrowers. Table 6.1 outlines five common forms of working capital financing.

Table 6.1 – Forms of working capital finance

Financing instrument	Description	Features
Line of credit	Firm draws on loan as needed up to the maximum limit established.	♦ secured or unsecured ♦ annual repayment ♦ compensating balance may be required
Accounts receivables (AR) loan	Loan secured by accounts receivables (ARs) as a way to pledge collateral.	♦ loan amount based on a percentage of ARs ♦ ARs assigned to lender as sales occur ♦ loan balance paid down with AR collection
Factoring	Sale of accounts receivables (AR) to a third party collector (factor house) which bears the collection costs and risks of non-payment.	♦ company paid based on average collection period less a collection fee ♦ collection amount can be advanced with an interest charge
Inventory loan	Loan secured by inventory as a form of collateral.	♦ loan amount based on a percentage of inventory value ♦ lender receives security interest in inventory and may take physical control ♦ inventory is released with loan repayment
Term loan	Medium-term loan whereby the lender is repaid over several years (usually between 3 and 7 years) based on a fixed schedule.	♦ loan amount tied to collateral value ♦ can be fully amortised or a balloon loan

Source – adapted from Seidman, 2005: 95-100

Major providers of working capital finance include commercial banks, representing the largest financing source for external business debt; saving banks and thrift lenders, especially for small business loans; and commercial finance companies who are usually able to make higher-risks loans given the relatively low levels of regulation they face (Seidman, 2005: 101-102).

5.3 Credit and trade – trade finance

Trade finance offers a way to structure working capital finance in relation to international trade (UNESCAP, 2002). Often considered as the "lubricant of international trade" (Finger and Schuknecht, 1999:4), trade finance facilitates the expansion of trade through the provision of reliable, adequate and cost-effective sources of financing, thus helping to shape the competitiveness of trade participants' terms of trade (Auboin and Meier-Ewert, 2003). Exporters need credit

to finance the process or manufacture of products for the export market before receiving payment. Being able to offer attractive payment terms to buyers is often central in getting a contract and requires credit. Importers need credit to buy goods abroad and sell them in the domestic market before paying for imports (UNESCAP, 2002). In both instances, trade finance facilitates international transactions by bridging the time and associated resource gap between goods production and delivery on the one hand, and payment on the other hand. Relevant documentation and collateral strengthen the promise of future payment underpinning credit agreements.

Trade finance includes a number of instruments and packages designed to facilitate the financing of transactions, of which the most commonly used are outlined in table 6.2 according to their source.

Table 6.2 – Trade finance instruments

Instrument type	Description
Trade finance provided by banks e.g. loan overdraft, bid, advance payment bonds, letters of credit	
Documentary credit	Common form of commercial letter of credit whereby the issuing bank commits to make payment to the exporter, either immediately or at a prescribed date, upon the presentation of required documentation including shipping, insurance documents and commercial invoices.
Pre-shipping financing	Financing – either through short-term loans, overdrafts or cash credits – for the period prior to the shipment of goods, to support pre-export activities like wages and overhead costs, especially when inputs for production are imported. Especially important for smaller enterprises as the international sales cycle is usually longer than the domestic sales cycle.
Post-shipping financing	Financing – either through short-term loans, overdrafts or cash credits – ensuring adequate liquidity for the period following the shipment until the buyer receives the products and the exporter the payments.
Buyer's credit	To assist an exporter, a bank in the exporting country may extend a loan to a foreign buyer to finance the purchase of exports, thereby allowing extended time to the buyer to pay the seller under the contract.
Other forms of trade financing e.g. bills of exchange or promissory notes	
Supplier's credit	Financing arrangement under which an exporter extends credit directly to the buyer in the importing country to finance the buyer's purchase.
Factoring or forfeiting	Involves the sale at a discount of accounts receivable or other debt assets by the exporter to a factoring or forfeiting house on a daily, weekly or monthly basis in exchange for immediate cash. The third party bears the commercial and political risks of the account receivable. While factoring is primarily used to finance domestic trade, forfeiting describes similar forms of financing in international trade.

Countertrade	Contractual agreement(s) whereby the seller of goods and services agrees to purchase goods and services from the buyer or the buyer's country in partial or whole payment for its products. Enables trade with countries with limited foreign exchanges holdings.

Source – adapted from UNESCAP, 2002; Auboin and Meier-Ewert, 2003; and Nkini, 2006

The choice of the appropriate financing instrument is likely to depend on three factors: the perception of the type and size of the risk involved in the transaction; the distribution of risk and risk reduction efforts between trade participants and their respective banks; and the costs of risk reduction through insurance (Finger and Schuknecht, 1999).

The Uniform Customs & Practice (UCP) framework governing the commercial use of letters of credit was developed by the International Chamber of Commerce (ICC), established in 1919 to facilitate international trade. As the volume and value of international trade has grown, there has been a significant shift away from traditional trade instruments, such as letters of credit, in favour of trading on open account. The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a cooperative whose network allows international money transfers across a network of over 9,000 banks in over 200 countries. With ICC, SWIFT has developed the Trade Services Utility (TSU), a data matching application that sits centrally on the SWIFT network. The TSU enables participating banks to match key data elements extracted from a range of trade documents. The Bank Payment Obligation (BPO) is an optional component of a TSU transaction which places a legal obligation on the issuing bank to pay the recipient bank subject to the matching of compliant data in the TSU. BPOs are intended to supplant commercial letters of credit using standard ISO 20022 messages.

Trade participants face a range of risks associated with transactions including commercial or non-payment risks, as well as political and other policy risks (including domestic issues, foreign policy and economic policy), especially in the context of international trade. Commercial or non-payment related risks include the non-acceptance of goods by the buyer, the failure of the buyer to pay debt and the failure of banks to honour documentary credits. Political risks relate to domestic tensions (riot, civil unrest as well as a deficient banking system); foreign policy issues (such as war, embargo); and economic policy risks (such as the blockage of foreign exchange transfers and currency devaluation) (WTO, 2003: 3; Finger and Schuknecht, 1999: 6-9; UNESCAP, 2002: 60-61). Trade credit insurance does not represent an additional source of financing but rather helps to mitigate the financial impact of such risks and to strengthen the trading environment within which companies operate. While the format of credit insurance varies across countries and depends on the perceived needs of trade participants, the premiums are likely to depend on the risk of the export markets and export products. The most commonly used forms of credit insurance are briefly described in table 6.3 (UNESCAP, 2002: 60-61).

Table 6.3 – Forms of credit insurance

Type of insurance	Description
Short-term export credit insurance	Protection for not more than 180 days including pre- and post- shipment risks and, subject to agreement, commercial and political risks.
Medium- and long-term credit insurance	Protection provided for financing exports of capital goods and services which is issued for credit extending over longer periods (up to 3 years or longer).
Investment insurance	Insurance offered to exporters investing in foreign countries.
Exchange rate insurance	Insurance covering losses as a result of fluctuations in exchange rates between exporters' and importers' currencies over a period of time.

Source – adapted from UNESCAP, 2002

While trade credit insurance provides some protection to trade participants, credit guarantees help to safeguard trade-financing banks from losses that may occur from providing loans to trade participants. Guarantees, usually issued by financial institutions or government agencies set up to promote export and international trade, do not create credit; they do, however, facilitate trade participants' access to finance by backing issuing banks, especially for those companies without favourable or otherwise sufficient track records. Direct or indirect government involvement in the provision of credit guarantees illustrates one way by which governments can promote trade by promoting credit (UNESCAP, 2002: 60-62).

5.4 Supply, demand and credit availability

The availability of credit, whether working capital finance or trade finance, is subject to the fluctuations that affect the wider economy, including volumes of world trade and the stability of financial and monetary systems, all of which were seriously impacted during the financial crises from 2008 (Bridge, 2011).

Financial and economic crises tend to result in constrained credit availability. These constraints affect short-term financing in particular, due to a combination of growing risk-aversion, the increased costs of credit and 'herd' behaviour, where lenders retreat from markets in which risks are perceived to be too high. On the supply-side, decreased availability of short-term finance, shortened maturities and rising interest rates reduce credit availability. On the demand-side, companies can experience difficulties in anticipating the level of demand for their products. This is true not only in the domestic market but, more importantly, in world markets (Auboin and Meier-Ewert, 2003: 6-8). Recent evidence suggests that in times of crisis, demand for trade finance grows exponentially, especially as other sources of working capital finance dry up and credit provision (from both public and private institutions) is insufficient and scattered (ICC, 2008).

In addition to supply and demand imbalances, two further issues relating to credit tend to arise during times of crisis and during periods of economic recovery. First, there is heightened risk in 'picking winners' to whom to extend credit as difficult economic climates affect different types of companies to varying degrees. Unlike smaller companies, larger corporations are likely to find alternative ways of financing their activities, notably through access to syndicated loans and capital markets (Auboin and Meier-Ewert, 2003: 10). Additional sources of corporate finance include

corporations lending to each other. A recent example was the launch of the Corporate Funding Association[23] project in January 2010, which has 16 large corporate members from six countries (Roca *et al*, 2010: 18-20). Second, smaller companies (especially SMEs) tend to suffer more significantly and for longer periods of time from restricted access to credit. SMEs struggle due to the tightening of credit requirements and costs; the lack of established relationships with their buyers, whether in the domestic or international markets, which is often reflected in reduced demand for their goods and services; and limited access to remedy emergency credit programmes. There is also significant competition in accessing credit through SME-oriented programmes (Auboin and Meier-Ewert, 2003; Federation of European Accountants, 2008).

It is generally agreed that adequate and affordable trade finance is critical to economic recovery and growth. "Buyer Driven Receivables Programmes" (BDRPs – basically new forms of factoring) seem to offer potential for growth for mid-sized firms and SMEs, given their relative simplicity for both buyer and supplier, and the fact that the accounting treatment is favourable to buyers" (BIS, 2010: 22). A recent ICC Global Survey of over 200 banks across 94 countries highlighted the constraints on credit availability for SMEs in developing countries, with respondents indicating that new regulation under Basel III, and the increase in the leverage ratio of banks, was likely to significantly curtail banks' ability to provide affordable financing to SMEs (ICC Banking Commission, 2011: 16-17). Developed markets tend to rebound from financial crises more quickly than developing markets, as the deterioration in the general credit-worthiness of trade participants is exacerbated by wider political risk aversion of commercial banks (ICC Banking Commission, 2011: 13). A shortage of liquidity coupled with disproportionate aversion to risk drives up interest rates on credit loans and advances, and reduces trade finance in general in developing economies, and for SMEs in advanced economies (ICC Banking Commission, 2011: 16-30). International and regional development banks play a major role in supporting international trade and finance through risk coverage, but also by filling liquidity gaps (UNCTAD, 2009; ICC, 2011).

5.5 Credit availability – perceptions and reality

Corporate credit availability, especially for SMEs, has been one of many issues at the centre of discussions in political and economic circles since the financial crises of 2008. Surveys highlight constraints on the availability, affordability and ease of access to bank credit. Across OECD countries, a reduction of bank lending (for example, the share of SME loans in total business loans declined in most OECD countries), coupled with the tightening of credit terms (as SME creditworthiness declined and interest rates rose), could have affected SMEs more than larger corporations. While the volume of SME loans relative to total business loans declined, in aggregate terms the volume of bank credit to SMEs was sustained by a series of government programmes targeting loan guarantees, increasing the capital base for institutions, export facilitation and credit mediation across several OECD countries (Potter and Thompson, 2011).

The BIS SME Barometer revealed that the state of the economy was the most frequently mentioned impediment to growth by SMEs, followed by other obstacles such as cashflow, taxation, competition, regulation and obtaining finance (BIS, 2011:

[23] http://www.corp-funding.com/

2). In the UK, monitoring of lending trends by the Bank of England seems to confirm a continued contraction in the stock of bank lending to businesses overall, and to SMEs in particular (Bank of England, 2011: 4). A 2009 survey of SME finance commissioned by BIS found, however, that perceptions of credit availability were worse than actual credit availability. The survey reported that "of the overall SME population, 16% of all UK SMEs were offered debt finance in 2009, 5% were turned down for this by all sources and the remaining 79% did not apply" (BIS, 2010). SME financing concerns seem to be lower than commentators anticipated, or perhaps SMEs have given up waiting for bank finance (BDRC International, 2011). Further investigation of SMEs that did not apply for credit revealed that the majority did not feel a need for credit, while 6% anticipated that they would be turned down. This may reflect a tendency of SMEs to try cutting costs before applying for additional credit.

The majority of SMEs "perceive that it is now harder to obtain finance compared to 2007" because of difficulties encountered in obtaining a secured loan or overdraft, of increased levels of security requirements and of increased costs of finance (BIS, 2010: 1-10). A recent McKinsey report on the cost of capital suggests that a future "global savings glut" - with consumers providing less credit and corporate investment increasing after recent lows - will lead to even tighter credit conditions. The result will be higher interest rates and "costlier and tighter credit", thus increasing the pressure to find new ways of releasing corporate credit" (McKinsey Global Institute, 2010).

5.6 Emerging alternatives to conventional debt finance

The tightening of bank lending has encouraged alternative means of finance and further innovation in cheaper and easier access to credit for companies. Alongside existing financing such as factoring (where a business borrows money against its invoices) and asset-based financing (where money is borrowed against assets), new financing models make use of the internet to connect communities of lenders and borrowers (Moules, 2011). One innovation is peer-to-peer (P2P) lending, where "individuals or companies agree to lend money to each other through an online money exchange" (Moules, 2011). In the C2C segment, Prosper.com and Zopa are good examples of innovative direct consumer credit in the US and in the UK. Zopa claimed in March 2011 that its half a million members had lent more than £125 million between each other, equal to a market share of 2% of the UK personal unsecured loan market.

Peer-to-peer lending has been adapted to C2B and B2B lending with companies such as Funding Circle[24] and ThinCats.com[25]. Launched in 2010, Funding Circle provides an online marketplace for individuals to lend to SMEs. In February 2011, six months after it started trading, it counted over 3,500 members providing nearly £8 million in loans to slightly over 100 SMEs in the UK. ThinCats.com set up an online marketplace for secured business loans provided by 'experienced investors' using an auction model and 'sponsors' advisory services' to underpin a loan approval process. Business can borrow between £50,000 and £1m at fixed competitive rates from 6 months to 5 years (Bradshaw, 2011).

[24] http://www.fundingcircle.com/?utm_nooverride=1
[25] http://www.thincats.com/

To offer a serious alternative to bank finance, however, these initiatives need to reach critical mass to ensure reliable credit availability. It also remains to be seen how they will coexist with conventional credit providers once normal market conditions are restored, particularly as conventional credit lenders have an inherent advantage, the ability to lend more in funds than they have themselves raised (Moules, 2011).

5.7 Implications for a capacity exchange

Recent economic crises, along with subsequent efforts to rebuild bank balance sheets and to impose more stringent regulations on capital reserve requirements, have reduced traditional credit facilities. Constrained credit supply has led some businesses to seek new credit sources in order to maintain trading activity. SMEs seem to struggle more than larger organisations to access trade finance and credit. A capacity exchange which reduces the traditional credit requirements of organisations, or allows them to turn their own productive capacity into a source of 'credit', could be attractive and relevant to today's businesses. Credit on capacity exchanges is tied to the role of common tender. The next chapter will explore the role of money in trade, in order to underpin later discussion on the implications of common tender in multilateral reciprocal trade.

6 Money

This chapter explores the role money plays in fostering communities and facilitating trade. It considers different forms and types of money, with particular reference to sovereign currencies. The role of money in communities and in trade is explored. The chapter concludes with a discussion of the costs of sovereign currencies and looks at some alternative monetary designs which attempt to combat or avoid these costs. The discussion of money provides the background for assessing the role of common tender in multilateral reciprocal trade (developed in chapters 8 and 9).

6.1 Concept definition

An old economics rhyme for money is, "Money is a matter of functions four, a medium, a measure, a standard, a store." Modern definitions of money tend to be more fastidious, stating that money is a medium of exchange with two properties – it can be used as a unit of account and as a store of value. Money's first property as a unit of account is providing a common measure of the value of goods and services being exchanged. Money's second property is storing value. In order to be a medium of exchange, money must retain value over time. Otherwise, it would not unpick the 'double coincidence of wants' problem found in pure barter situations. Many things can store value, such as non-perishable commodities, art or land. One can rapidly conclude that money is both time-binding and space-binding. To defer payment, the value of money must span time. To be a useful unit of account, the reckoning of money must span space and communities.

Money is characterised by being 'liquid' i.e. readily transferable into other forms of value; widely accepted; and easily transportable. Of the many things that have been money, barley seeds are interesting because, despite their monetary peculiarity to us today, the seeds exhibit the two properties of money: a high degree of uniformity, thus making them an excellent unit of account; and they can be held over for another season's planting, thus providing a store of value. To be money, the medium of exchange must be a standard for deferred payment. This is why perishable fruit may be a medium of exchange from time-to-time, but has never really taken off as money. Jevons enumerates seven characteristics of successful money: "utility, portability, indestructibility, homogeneity, divisibility, stability of value, and cognizability" (Jevons, 1896, reprint 2005: 31). Much confusion accompanies the fact that historic materials for monies have often had value in their own right, e.g. metals, yet the monetized materials are more valuable than as raw commodities:

> "As a medium of exchange, money has to be continually handed about, and it will occasion great trouble if every person receiving currency has to scrutinize, weigh, and test it. If it requires any skill to discriminate good money from bad, poor ignorant people are sure to be imposed upon. Hence the medium of exchange should have certain distinct marks which nobody can mistake." (Jevons, 1896, reprint 2005: 40)

6.2 Forms of money

Money can also be 'backed', i.e. the issuing organisation guarantees that scrip or coin presented to the issuer will return something of value such as gold or oil or other commodities. Money today is widely assumed to be fiat currency or sovereign currency (state currency), which is unbacked or 'state-backed'. Much has been

written on the transition from gold-backed currencies to state-backed sovereign currencies, most notably when President Richard Nixon took the USA off the gold standard in August 1971.

Sovereign currencies are widely accepted as a means of exchange at local, national and international levels. While the majority of trade takes place using sovereign currency, other types of money are, or have been, in use. Some of these are outlined in table 7.1.

Table 7.1 – Types of money

Types of money	Description	Examples
Representative money	Money that consists of token coins, or other physical tokens such as certificates, that can be reliably exchanged for a fixed quantity of a commodity such as gold or silver. The value of representative money stands in direct and fixed relation to the commodity that backs it, while not itself being composed of that commodity (Al-Shibli, 2011: 77).	Gold certificates Silver certificates Tobacco notes
Sovereign (Fiat) money	Sovereign money or currency is money whose value is not derived from any intrinsic value or guarantee that it can be converted into a 'valuable' commodity such as gold. Sovereign money is government issued money that has been declared (fiat is Latin for "let it be done") legal tender and which government declares acceptable for taxation purposes. Usually, the government declares the sovereign currency (typically notes and coins from a central bank, such as the Federal Reserve System in the U.S.) to be legal tender, making it unlawful not to accept the sovereign currency as a means of repayment for all debts, public and private (cited in Al-Shibli, 2011).	US dollar – US$ UK sterling - £ CH Franc- CHF etc.
Commodity money	Commodity money is money whose value comes from a commodity out of which it is made, typically some metal, e.g. gold, silver, aluminium, but could be and has been many things from livestock to energy. Commodity monies are objects that have value in themselves as well as for use as money to facilitate trade (Al-Shibli, 2011: 77).	Gold Silver Livestock Energy

Composite money	A composite currency is a weighted combination or basket of two or more currencies or commodities. A composite currency ordinarily would not circulate as a medium of exchange, like the US dollar or Japanese yen, but it can serve as a unit of account and store of value. Service as medium of exchange, store of value and unit of account are the three basic functions of money (Kredi Hesaplama, 2011).	European Currency Unit (ECU)[26] World Currency Unit (WOCU®)[27] Special Drawing Rights (SDRs)[28]
Common tender[29]	Money commonly accepted as payment of debt without coercion of legal means (Timberlake, 1987b: 81). It is issued by entities other than governments and then used in trade.	B2B – WIR francs/credits (CHW), ITEX dollars, B2C – Ithaca Hours C2C/B2C – Brixton pounds, Linden dollars (Second Life)

6.3 Sovereign currencies

In 1930 Keynes described the transition to Chartalism[30], also referred to as Modern Monetary Theory, which is a descriptive economic theory based on the use of government issued tokens as money, in turn founded on the State's monopoly on the use of force:

> "The State, therefore, comes in first of all as the authority of law which enforces the payment of the thing which corresponds to the name or description in the contract. But it comes doubly when, in addition, it claims the right to determine and declare what thing corresponds to the name, and to vary its declaration from time to time – when, that is to say it claims the right to re-edit the dictionary. This right is claimed by all modern States and has been so claimed for some four thousand years at least. It is when this stage in the evolution of Money has been reached that Knapp's Chartalism – the doctrine that money is peculiarly a creation of the State – is fully realized. … To-day all civilized money is, beyond the possibility of dispute, chartalist." (Keynes, 1930: 4-5)

[26] Former currency unit of the European Communities; adopted in 1979, it was used as a standard monetary unit of measurement of the market value/cost of goods, services, or assets. Composed of a basket of currencies of the European Communities, it was replaced by the euro at a ratio of 1:1 on 1 January 1999.
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:European_currency_unit_(ecu)

[27] http://www.wocu.com/wocu/

[28] International reserve asset created by the IMF in 1969 to supplement member countries' official reserves. The value of SDR is based on a basket of four key international currencies, and SDRs can be exchanged for freely usable currencies. http://www.imf.org/external/np/exr/facts/sdr.htm

[29] See appendix 10.

[30] For a modern discussion of Chartalism, see Tcherneva, 2005.

"'Legal tender' has a very narrow and technical meaning in the settlement of debts. It means that a debtor cannot successfully be sued for non-payment if he pays into court in legal tender. It does not mean that any ordinary transaction has to take place in legal tender or only within the amount denominated by the legislation. Both parties are free to agree to accept any form of payment whether legal tender or otherwise according to their wishes" (The Royal Mint, 2011). While private contracts can be written with any 'tender' for settlement, governments write contracts to acquire things in the form of their own debt. When governments issue debt they do so as bonds, a promise to repay over time. A bond creates future obligations for taxation, and thus creates currency, in other words legal tender. Legal tender commonly circulates as people use it for private transactions. But when people pay governments their own legal tender for an obligation, they extinguish government debt. Sovereign currency is valuable because it can be used to extinguish future obligations to government. However, this value is only within the community controlled by government. A French person finds a British pound of less use than a Briton because he or she is not subject to British taxation. There are examples of monies, most notably gold, which transcend governments.

6.4 Credit and debit systems – money in communities

The origins of credit and debit systems are still poorly understood. Anthropologists note that the earliest known evidence for credit and debit systems are Mesopotamian cuneiform (circa 3500 BC) which precedes the invention of coinage by about two millennia. Credits and debits create, perhaps temporarily, inequality among people. "It seems … that this agreement between equals to no longer be equal (at least for a time) is critically important. It is the very essence of what we call 'debt'" (Graeber, 2011: 120). Ancient and modern credit and debit systems are difficult to study in purely economic terms without incorporating the diversity of human relationships.

Adam Smith believed that "Difficulties of barter lead to the selection of one commodity as money" (Smith, 2003: 33). Anthropologists question simplistic origins of barter, "No example of a barter economy, pure and simple, has ever been described, let alone the emergence from it of money; all available ethnography suggests that there never has been such a thing" (Humphrey, 1985: 48). Pure barter may be relatively recent. "In fact, there is good reason to believe that barter is not a particularly ancient phenomenon at all, but has only really become widespread in modern times. Certainly in most of the cases we know about, it takes place between people who are familiar with the use of money, but for one reason or another, don't have a lot of it around" (Graeber, 2011: 37).

In much research on credit and debit systems, the idea of 'community' arises as a matter of course. A community might even be defined as a group of people prepared to be indebted to one another. Credit and debit systems permitted the formation of economic communities across wide distances. There are numerous examples of manufacturing and trading networks from silk routes to the salt trade, from rum and slavery to silicon chips and software. The organisation of the community is remarkably often entwined with the structure of the credit and debit systems, including such examples as the Phoenician trading culture, Knights Templar, northern late medieval trading networks, tally sticks, various East and West India companies or modern e-currencies (Cooper, 2010). In the case of sovereign currencies the community has been defined by government. To pick one example

in depth, consider the evolution of putting-out systems in Germany that divided the work among networks of guilds in the Middle Ages, as described by Kieser:

> "In the sixteenth century another kind of putting-out system evolved: long-distance merchants contracted with guilds. These contracts normally specified that the guild had to deliver certain products (textiles in most cases) in quantities that almost completely exhausted its production capacity. The merchants paid an advance in money in order to enable the guild masters to buy raw material and to sustain their living between delivery dates. Their contracts with guilds allowed merchants to secure large quantities of goods in specified qualities without being forced to maintain a large administrative staff. The guilds coordinated the production and guaranteed the contracted delivery dates as well as the quality of products. This form of putting-out proved advantageous for both sides. The guilds grew and gained a standard of living that was higher than that of comparable guilds that remained outside this system. The merchants were able to enlarge their international sales network." (Kieser, 1994: 612)

Of the numerous examples of production and trade, the above example incorporates the basic concepts of this report: capacity, trade, credit, and money. Kieser continues, "Putting-out systems contributed considerably to the development of the German economy: around the year 1800, 50% of the workforce was employed outside craft production, and 85% of them were produces in putting-out systems" (Kieser, 1994: 612).

6.5 Credit and debit systems - money in trade

The need for money in trade is complex. Individuals and organisations have the 'capacity' to provide goods and services for trade. They then conduct trades, some of which are asymmetric, i.e. one side of the trade does not provide full settlement at the same time. Asymmetric trade typically involves deferring some obligation over time, creating a credit for one party and a debit for another. If these credits and debits are recorded, a unit of account is created. These credits and debits, if trusted and used, create a store of value. If these credits and debits can be traded - that is one party can use a credit they own to discharge a debt they owe to a third party - the credit and debit system becomes a medium of exchange, i.e. money. As Riegel has argued, 'trade creates money': "when men form a compact to trade with each other by means of accounting, in terms of a value unit, then a monetary system is formed and actual money springs into existence when any of them, by means of the act of paying for a purchase, incurs a debit in the accounting system" (Riegel, 1978: 21).

A common misunderstanding of Walras' general equilibrium theory is that it argues in favour of pure barter with no need for money, and this misunderstanding is often used as the basis for the claim that multilateral reciprocal trade systems (including capacity exchanges) have no need for money. On the contrary, Walras insists that it is entirely necessary to have "a commodity in which the prices of other commodities are cried" and "a commodity for which services are sold, on the market for services, and with which products are bought, on the market for products, and which serves as money" (Walras, 1886: 1-123) and that the use of money is necessary to the attainment of equilibrium in the Walrasian system. What Walras argued strongly against was the issuance of bank notes – in his mind an entirely different matter.

Both Marget (1935) and Hilton (1995) observe that Walras's money was not some abstract unit of account (such as the ECU) but was a hard commodity, i.e. coinage, and that Walras defined money as a commodity which served the purposes of both a medium of exchange and a store of value.

Money appears to have evolved in part in order to provide benefit to trading communities:

> "The recognisability effect of money states that money crowds out real goods payments. The origin of this effect is that agents prefer to be paid with money — an object of universally recognized quality — rather than with goods of uncertain quality, and this desire gives rise to an endogenous role for money. It is this reduction of uncertainty that, at least since Menger (1892), has been considered to be an important advantage of monetary exchange over barter. The insurance effect of money states that money crowds in consumption. The origin of this effect is that money provides insurance by disconnecting the quantities that agents can buy from how they are assessed by their trading partners. In particular, this insurance allows agents to consume even when they are recognised as low-quality producers" (Berensten and Rocheteau, 2002: 32).

6.6 The cost of money

In their 2009 Trade and Development Report, UNCTAD asserted that "the dominance of the dollar as the main means of international payments also played an important role in the build-up of the global imbalances in the run-up to the financial crisis" (UNCTAD, 2009: X). Of the world's US$9.7 trillion of currency reserves the dollar accounts for 60.7%, while the Euro, the second largest reserve currency, accounts for 26.6% (The Economist, 2011b). Calls for the reserve currency to be replaced surface periodically but the extent to which this would address the fundamental issue of global imbalance is debatable, since it is the reserve currency concept[31], as well as the political and fiscal policies of sovereign nations themselves, which is the problem.

Sovereign currencies have costs. Of these, exchange rate costs are of particular significance to international trade which is possibly impaired, however slightly, by sovereign currencies, compared with a (potential) global currency for trade without exchange costs. In times of high volatility, the values of sovereign currencies fluctuate. Multi-national corporations spend a lot to manage the value of their sovereign currency (working capital) holdings, hence their large treasury functions. Interviewees seemed to feel that a common tender would exhibit less volatility, especially internationally. Yet each new currency creates more treasury management costs, increasing exponentially the number of currency 'crosses'. Large corporates have the wherewithal to handle a new currency, but they fear increased complexity.

Uncertainties around currency volatility and poor economic prospects undermine trust in sovereign currencies and prompt renewed interest in alternative forms of money. Modern attempts to develop a means of exchange to facilitate international commerce have focused on either extending the reach of multilateral

[31] See for example Reisen, 2009 and IMF, 2011b.

reciprocal trade networks or the concept of 'universal currencies'. Proponents of universal currencies claim to seek a stable alternative to sovereign currencies. Universal currencies are supposedly less subject to foreign exchange rate volatility and adverse policy interference. John Maynard Keynes is often credited with highlighting the need for a universal currency; his own proposal was the Bancor (Banc d'Or), a gold standard system. The International Monetary Fund issues Special Drawing Rights (SDRs), one current attempt at creating a universal or global currency. One private example of 'universal currency' is the WOCU® (World Currency Unit), a "standardised, apolitical basket currency derivative quotation based on the real time exchange rates of the currency pairs of the world's top 20 nations, as determined by IMF measures of GDP" (Stagni, 2011: 17). The WOCU® claims a less political methodology and a more frequent update period than SDRs, being revised every six months versus the IMF's five year revision period. That said, any moderately diversified currency basket is likely to exhibit lower volatility than any currency pair. Figure 7.1 demonstrates the lower volatility exhibited by the WOCU® compared to the other sovereign currencies. However, claims that a common tender designed on a basket of currencies will be less volatile only apply if the holder of the common tender has exposure to the constituent parts of the common tender's value in proportion to the tender itself. While the WOCU® mathematically exhibits lower volatility, holders of the WOCU® will only obtain the maximum volatility reduction if their own sovereign currency exposure matches that of the WOCU®.

Figure 7.1 – WOCU® volatility from baseline – US$ based

Source - WDX Organisation Ltd., 2011

A more recent concept - Money 3.0 (see appendix 19) - asserts that 21st century problems cannot be solved with 20th century solutions and that the monetary system which has underpinned economic development in the 20th century is no longer

relevant in a world which is increasingly connected online. Proponents posit a new type of market structure - Market 3.0 - which is envisaged as decentralised and connected; where market presence will be on a market network; and where money will be a relationship rather than an object or a unit of credit. At its core is the concept of peer-to-peer financing through peer-to-asset funding (see appendix 12).

6.7 Implications for a capacity exchange

Attempts to create new kinds of money to combat the perceived shortcomings of sovereign currencies are not new. Old ideas, such as the Bancor or SDRs, and new ideas, such as UTU™, WOCU® or Money 3.0 provide a theoretical context for the evolution of common tender within multilateral reciprocal trade.

7 Emerging Architectures for Trade

This chapter explores three models of multilateral reciprocal trade taking place today: countertrade, corporate (or media) barter and retail barter. It presents the different forms, motivations, participants and risks and opportunities of each model. The chapter concludes by assessing the set-up requirements for retail and corporate barter exchanges; how participants are currently attracted to this type of trade; what type of goods and services are currently traded; the level of brokerage and automation currently practised on these kinds of exchanges; issues that have arisen relating to the issuance of common tender; and the way the industry is currently regulated.

Conventional cash transactions surround us and are easy to enumerate. Financial market trading is enormous, with colossal amounts of cash-accounted transactions whose numbers dwarf physical trade. Sovereign currency trade numbers account for most transaction statistics at both international and national levels. Countertrade and organised forms of barter offer alternative trading mechanisms, but their volumes and values are difficult to establish or evaluate.

While estimates vary greatly and the methodologies used to appraise the volume and value of countertrade and organised forms of barter lack transparency, some well-known examples include:

- E.ON's capacity swap with EDF in 2009 to dispose of more than 10 billion Euros of assets during 2009 and 2010 to trim debt amassed from acquisitions and satisfy antitrust rules (Humber and Comfort, 2009);
- Tasweeq, the marketing division of Qatar Petroleum (QP) selling one million barrels of crude on behalf of Libyan rebels and helping them purchase four cargoes of refined products in early April 2011, amidst conflict to overthrow Gaddafi (McDermott, 2011);
- Saudi Arabia's purchase of 10 Boeing 74 jets in exchange for oil, at a discounted value of 10% on world prices in 1984 (Carter and Gagne, 1988); or more recently China and Iran's plans to barter Chinese goods and services for Iranian oil (Bozorgmehr *et al*, 2011);
- the rise of direct barter in transition countries of the former Soviet Union between 1989 and 2000, representing less than 5% of industrial sales in 1992 and amounting to circa 50% of industrial sales in 1998 (Carlin *et al*, 2000; Bold, 2004).

This chapter explores existing forms of multilateral reciprocal trade used alongside conventional trade. The focus is on the re-emergence of countertrade and modern and organised forms of barter using membership-based trading networks. Countertrade is defined as cross-border "commercial transactions in which provisions are made, in one or a series of related contracts, for payment by delivery of goods and/or services in addition to, or in place of, financial settlement" (Carter, 1997); modern and organised forms of barter are defined as a form of multilateral reciprocal trade whereby three or more parties trade capacity with each other using a means of exchange backed by the goods and services traded.

Multilateral reciprocal trade networks claim to handle a variety of products and services - empty seats, empty rooms, overstocked inventory, seasonal products, slow-moving merchandise, time-sensitive products or services such as unfilled

appointment times, unsold or unrented office space. An illustration of the range of transactions undertaken on multilateral reciprocal trade networks is presented in table 8.1. The values of the trades in the table are imputed. These trades involved a number of different parties and were sometimes complex, with multiple participants often taking partial amounts. These types of multilateral reciprocal trades can require a significant amount of human resources to initiate and conclude.

Table 8.1 – Sample goods in multilateral reciprocal trade[32]

Goods/Services	Location	Value (US$)
Communication equipment	Europe	1,500,000
Rubber	Europe	1,320,000
Communication equipment	Europe	6,000,000
Software upgrade	Europe	7,000,000
Rechargeable batteries	Europe	650,000
Transport planning	Philippines	60,000
Coconut oil	USA	15,000,000
Copper cathodes	Singapore, China	15,000,000
Public relations	Philippines	100,000
Coconut oil	South Africa	1,900,000
Cordless phones	USA	5,800,000
Radar detectors	USA, Netherlands	1,500,000
Garments	Europe	7,800,000

Offers to trade are diverse and, as well as those in the table above, include aircraft, advertising, commercial windows, jewellery, real estate/property and many other goods and services.

7.1 Countertrade

Countertrade involves "commercial transactions in which provisions are made, in one or a series of related contracts, for payment by delivery of goods and/or services in addition to, or in place of, financial settlement" (Carter, 1997). It is seen as "one of the oldest methods of payment in international trade" (UNCTAD, 2001: 10) but contemporary estimates of countertrade vary greatly. Regularly quoted figures indicate that countertrade allegedly accounts for 20% or more of world trade, involving some 90 countries and accounting for US$100 to 150 billion (Platt, 1992; Carter, 1997).

7.1.1 Typology of countertrade

Contrary to common belief, countertrade is not trade without cash. Countertrade agreements are generally deals where imports, exports and trade finance are all part of the same package (Sercu, 1990). The existing terminology used to describe countertrade can be confusing and is often used inconsistently. Table 8.2 attempts to clarify some of the important dimensions of countertrade transactions.

[32] Goods, services and values are a representative sample from one exchange in the retail and corporate barter sector.

Table 8.2 – Dimensions of countertrade transactions

Dimension	Option
Time	Single delivery contract
	Multiple delivery over several time periods
Method of financing	No currency involved as a mean of payment
	Some currency required in addition to exchange of goods or services
Balance of compensation	Value of goods imported is less than value of goods exported
	Value of traded goods is equal
	Value of imported goods exceeds that of exported goods (usually as a reflection of the risk associated with a lengthy payback)
Pertinence of compensating	Imported goods are needed in-house
	Imported goods are not needed, therefore are sold on to a third party

Source – adapted Figure 7.5 from Carter, 1997

Countertrade transactions vary greatly in terms of transaction type, scope, scale, volume, frequency and size of participants. Table 8.3 outlines the main forms of countertrade:

Table 8.3 – Forms of countertrade

Type	Description	Key features
Barter	Direct exchange of goods and/or services covered by a single cross-border contract.	*double-coincidence of wants/needs *simultaneous fulfilment * local or international (e.g. as a form of countertrade)
Buy-back	Form of countertrade where the supplier of capital plant or equipment agrees part-payment as a share of future output of the facility.	*fulfilment is distant in time
Counter-purchase	Form of countertrade involving a reciprocal purchase agreement of goods for cash but consisting of two separate contracts contingent upon each other (counter-obligation). The seller/exporter is thus granted normal payment terms but agrees at the same time to buy goods from the importer or a nominated third party.	*simultaneous or parallel fulfilment

Evidence or Clearing Accounts	Form of countertrade whereby companies or traders with a significant level of continuing business in certain markets may be required to arrange counter-purchase exports from those markets at least equivalent to their own imports with the country concerned.	* mostly government mandated * usually longer-term arrangements
Offset	Form of countertrade, whereby a large supply contract (e.g. for military equipment or airplanes) is conditional upon the incorporation into the contract of certain goods or services supplied by the buyer's country that should be offset from the final price. The seller can fulfil the requirement with a firm other than the initial importer firm as long as it is from the same country.	* common for high-value, strategic industries e.g. military equipment
Switch-trading or swap deals	At corporate level, capacity swaps are exchanges of capacity or assets booked as revenue without money being exchanged.	*mostly industry-specific * mostly large industry participants *often international i.e. cross-border
Money surrogates	Promissory notes issued by companies, banks or governments with specified maturities and discount rates. At mature date, owners of surrogates can redeem for goods and services from the issuer.	*fulfilment is distant in time

Sources – adapted from UNCTAD, 2001; Young, 2006; Bold, 2004; Healey, 2004; Neale et al, 1997

7.1.2 Government involvement in countertrade

Government involvement in countertrade is common. Governments use countertrade to monitor imports, control government procurement and maintain the balance of trade, as well as to support export trade by promoting domestic industries in world markets. Countertrade has historically been associated with former communist countries (Russia and Eastern European countries) and developing countries lacking 'hard' currencies; and as a way for firms in developed countries to access markets that would not otherwise be accessible (Aggarwal, 1989).

Government attitudes towards countertrade typically take three forms. First governments can actively encourage countertrade, for example through government procurement policies where the government undertakes countertrade

transactions directly. Second, governments can impose barter and countertrade obligations on private parties without being part of specific transactions. Third, governments can promote, facilitate and advise on countertrade (Howse, 2010). While developed countries tend to refrain from explicitly promoting countertrade, offsets are commonly used for defence, oil and other strategic industry exports. For many developing and emerging countries, countertrade represents a way to enhance international trade positions, alleviate trade imbalances and diversify export industries. Table 8.4 provides some examples of the positions and requirements of both developed and developing countries in relation to countertrade.

Table 8.4 – Sample of government countertrade policies

Country	Date	Relevance of and reference for countertrade
Developed countries		
United States	reviewed in 1990s	No official offset policy. US government does not prohibit the use of countertrade and military offsets, but monitors their use and promotes fairness in such trade. The responsibility for such transactions lies with companies involved. These companies can however, benefit from advices from the US Department of Commerce. *See US Code, Title 15, Chapter 73, Sub-chapter II, section 4712 Barter and Countertrade; US Department of Commerce, 1990 Presidential Policy on Offsets and 1999 Defence Offset Disclosure Act.*
United Kingdom	under review	Currently under review. *Regulation – UK MoD: Industrial Participation Policy*
Australia	since 1970	Covers civil and military offsets; seen as alternative means of assistance and as a way to support access to world markets for Australian firms. Offset requirements are applicable to purchases of A$1 million where 30% of the content is imported. Between 1989-1990 A$895 million of government procurement accounted for A$372 million; aerospace and information technology accounted for 71% of offsets obligations. *See Australian Government Productivity Commission Civil Offset Program*
New Zealand	1990 onwards	Voluntary and informal offset policy welcomes commercially viable opportunities for New Zealand industry arising from major off-shore purchases by government departments and other agencies. It is not compulsory for purchasing bodies to require offset proposals in tender; it is acknowledged that the Department of Defence uses that option regularly. *See New Zealand Defence Organisation, Defence Booklet: Offset policy, articles 2.5, 2.6 and 2.7*
Developing and emerging countries		
Vietnam	-	No import licenses required for goods bought with other commodities including coal, marine and agricultural products.
Philippines	1993/1994	Government agencies and companies must adopt

Country	Date	Relevance of and reference for countertrade
		countertrade when transactions are superior to US$1 million and involve foreign capital equipment, machinery, goods and services. The Philippine International Trading Corporation (PITC) is the designated implementing agency. *See Philippine International Trading Corporation , Countertrade Executive Order No 120, 19 August 1993; Implementing Rules and Regulations, 14 November 1994*
Kuwait	1992, revised in 2007	Minimum offset requirement of 30% for transactions value from 1 million Kuwaiti dinars and above, with Kuwait government. The term for completion of the agreement is usually eight years. Seen as an effective way to stimulate Kuwait private sector, support government efforts towards privatisation and to achieve capital, skills and technology transfer. *See Kuwait Countertrade Programme and New Guidelines for Kuwait Offset Programme*
South Africa	1993	Countertrade and barter viewed as second-best alternatives when normal trade cannot be conducted. 100% offset required on import transactions valued for US$10 million or more, upon approval from Reserve Bank. Seen as a way to develop export industry and trade, encourage technology transfer, FDI and job creation (University of Pennsylvania, 1993).
Argentina	1985	Countertrade used to promote export of non-traditional, non-agricultural products. US$283.9 million of exports and US$275.0 million of imports covered by countertrade arrangements between 1985 and 1991 (GATT Secretariat, 1991). *See Law 21.101, article 11 and details in decree 176/85*

7.1.3 Drivers and motivations

Countertrade represents a way of structuring international sales when conventional means of payment are difficult, costly or non-existent (Hill, 2011). Countertrade is particularly attractive when trading with countries exhibiting high debt, currency shortages, restricted currency acceptance, international trade bans, trade restrictions or deficient banking or institutional arrangements, including uncertainties in contract and tax enforcement (Hill, 2011; Auboin and Meier-Ewert, 2003: 2; Llanes, 1998).

A company's attitude to countertrade will ultimately be influenced by top-management or decision-makers' perceptions and expectations of the advantages and disadvantages of countertrade, as well as by commitment both at a personal and company level (Llanes, 1998) to go through with such lengthy and complex contractual arrangements. In addition to creating opportunities for export and market expansion where cash-based exchange is hindered, countertrade can also serve as a way to source capital goods and technology while stimulating domestic industries in buying countries by tying their imports to exports. From the perspective of the selling country, countertrade is often a way to source raw materials in exchange for the disposal of obsolete goods that are otherwise unsellable (e.g. due

to upgrade in production equipment or technology) (Carter, 1997; CIPS, n.d.; Palich *et al*, 2001).

7.1.4 Criticisms of asserted benefits of countertrade

Economists have long debated the positive and negative aspects of countertrade, particularly its effect on international trade. On the one hand, countertrade is seen as a way to expand export opportunities and alleviate foreign exchanges deficits; on the other, countertrade practices are seen as "an archaic form of trade that reduces efficiency by moving away from free allocation of resources" (Yavas and Freed, 2001: 127) and are often criticised for lacking transparency and even encouraging corruption. Countertrade is also blamed for price distortions and lowering the quality of traded goods. While it remains difficult to prove quantitatively the extent of the benefits from countertrade, not least because of the lack of systematic recording of transactions, some economists have acknowledged the potential for countertrade to increase trade efficiency and create added value in instances of market failure, constrained liquidity and persistent principal-agent problems (Yavas and Freed, 2001).

There is broad consensus in the literature that countertrade is complex to undertake. Countertrade has often been criticised for disguising the true proceeds and costs of the goods traded, leading to problems concerning their quality, pricing, delivery and specification. Equally, countertrade agreements are often perceived as lacking flexibility and entailing complex and time-consuming negotiations, which ultimately can result in significant transaction costs, risks and uncertainties (see, for example, Sercu, 1990; CIPS, n.d.; Llanes, 1998; Carter, 1997; Aggarwal, 1989). Problems of countertrade complexity were echoed by some respondents to this project with experience of countertrade. They highlighted the need for in-house knowledge and expertise of such trading practices and the risks and uncertainties associated with the complexity of countertrade agreements. In a survey of Australian firms (Palia and Liesch, 1997), respondents indicated that countertrade allowed companies to increase sales volume, enter difficult markets, overcome credit difficulties, increase competitiveness and make better use of capacity. However, they equally highlighted a number of impediments discouraging countertrade including the difficulty of re-selling countertrade goods especially when not needed in-house; the lack of knowledge around countertrade; the complexity and length of negotiations; and increased uncertainty around the trading itself (Palia and Liesch, 1997).

There is no prohibition of countertrade in international law, yet the legality of countertrade has long been debated, especially after a surge in countertrade practice among communist countries during the 1980-90s. Based on GATT and subsequent WTO agreements, countertrade legality has primarily been contested on the grounds of transparency; violation of the 'most-favoured nation' principle by imposing a condition on imports that is likely to be met only by suppliers from certain countries and not others; and as a form of restriction on imports and exports which are prohibited by WTO members. However, in a recent analysis of such claims, Howse (2010) concludes that "governments as well as private parties may well engage in barter and countertrade transactions for reasons that are consistent with the spirit and the letter of the multilateral trading system" (Howse, 2010: 39).

7.1.5 Current and future prospects

Anecdotal evidence may indicate a rise in countertrade practices in the wake of financial crises, given the resulting lack of access to credit, increasing costs and declining availability of trade finance and other financial instruments used to manage the risks of international commercial transactions (Howse, 2010). In 2009, in the midst of the financial crisis and with rising food prices, a number of countries including Russia, Malaysia, Vietnam and Morocco were reported to be entering inter-government and countertrade deals centring on food commodities (Blas, 2009). These and other examples (see Bozorgmehr *et al*, 2011 or Petignat, 2010) reflect the concerns of some governments about the impact of large transactions on their balance of payments, as well as increasing structural trade deficits in times of slow economic recovery, debt exposure and currency uncertainty. Governments appear to show renewed interest in countertrade, modern financial intermediary firms[33] and electronic marketplaces[34]. Some trade associations, such as the Chartered Institute of Purchasing and Supply, provide guidance on how professionals can assist their organisations in managing countertrade transactions efficiently to the satisfaction of all parties (CIPS, n.d.). There are calls to monitor the incidence and structure of such transactions in order to better appreciate how countertrade might foster international commerce (Howse, 2010).

7.2 Multilateral reciprocal trade - modern and organised forms of barter

Two main models of multilateral reciprocal trade, commonly known as 'organised or modern barter', can be distinguished: *corporate barter* – which involves the exchange of goods or services, frequently based around a core of media and advertising capacity; and *retail barter* – member-based trading networks, primarily involving SMEs, which exchange a range of goods and services with one another. Major differences between the two models relate to the nature of goods and services that can be exchanged, as well as the degree and nature of brokerage, summarised in table 8.5.

Table 8.5 – Simplified typology of organised or modern barter

Sector	Targeted participants	Goods & services exchanged	Payment mechanism	Brokerage type
Corporate barter	Large corporations	Unsold or excess inventory, frequently for media/advertising capacity	Combination of reciprocal trade and cash, usually on a 50-50 basis	Principal
Retail barter	SMEs	All types	Reciprocal trade using a system of mutual credit based on common tender	Agent

Source - Adapted from Cresti, 2005

[33] see for example WalterSolutions - http://www.walterenergy.info/mainframe.php?page=collateral&level=27

[34] see for example Ormita - http://www.ormita.com/

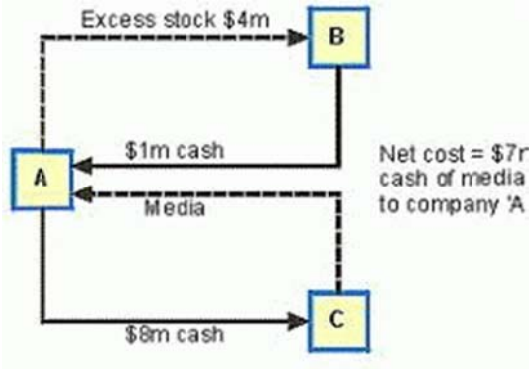
7.2.1 Corporate barter

Corporate barter consists of a third party broker buying media/advertising or travel capacity (which are all highly fungible) with cash, and also buying excess or unsold inventory from a company which is paid in a form of common tender or 'trade credit'. The company then pays the same broker for the media/advertising or travel capacity usually on a 50:50 basis of cash and common tender (Ormita, 2010: 21). Common tender can only ever be used as part payment for the media/advertising or travel services proposed. In this model, the third party is an intermediary who acts as a principal rather than merely as an agent, in that he or she takes a position on the trade by buying the unsold capacity (using common tender) before reselling it. The corporate barter broker directly manages the relationships with the client company that would like to generate revenue out of unsold capacity, as well as the company who ultimately buys the unsold capacity, and the pivotal media/advertising or travel provider.

Originally a US phenomenon, corporate barter companies (as they are commonly known) are present in both developed and emerging countries. In the UK, companies specialising in this type of service include Orion Trading[35], Miroma[36] and Active International[37]. These companies generally operate in more than one country and target large corporations, primarily manufacturers who are likely to have some degree of seasonal unsold or excess capacity and for whom making use of that 'dead capital' at its wholesale or book value is more interesting than over-discounted trade (Barter News, 2011).

Figures 8.1 and 8.2 outline a typical transaction without and with corporate barter. In a typical situation (figure 8.1) a company with unsold stock will want to sell it even at significant discount to avoid paying for storage and in order to generate cash flow to cover some, if not all, the costs of production. Major companies are likely to invest in media or advertising of some form at regular points in time. While these investments are deemed necessary to stay competitive and to attract sales, they do not directly generate revenue and are perceived as costs which require budgeting and affect available cash flow. The company will manage to cover only part of the media expense with the discount sale of excess stock.

Figure 8.1 – Typical transaction without corporate barter

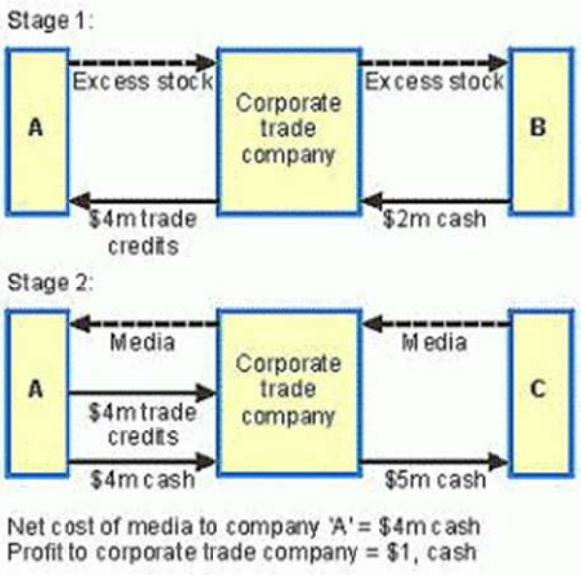


Source – Healey, 2001: 2

[35] Orion Trading – see http://www.oriontradingworldwide.com/WhoWeAre/AboutUs.aspx
[36] Miroma – see http://www.miroma.com/
[37] Active International – see http://www.activeinternational.com/

The value proposition of corporate barter lies in finding a better deal for the unsold capacity of a company; and matching it for advertising and media capacity in a way that is more cost-effective to the company and profitable to the corporate barter company. In figure 8.2 company A sells the same excess stock to the corporate barter company in exchange for US$4 million in trade credits (instead of US$1 million in figure 8.1). This excess capacity is then sold by the corporate barter company to company B in exchange for US$2 million paid in cash (still a better deal than the US$1 million that the company would have found in Figure 8.1). The corporate media company buys media capacity at a competitive cost of US$5 million (instead of the US$8 million that company A would have paid in the situation depicted in figure 8.1) and sells it to company A at a value of US$8 million. Company A pays only half in cash as the other half is paid for with trade credits.

Figure 8.2 – Typical transaction with corporate barter



Source – Healey, 2001: 2

Thus, the net costs of media to company A amount to US$4 million (instead of US$7 million) and the profit to the corporate barter company equals US$1 million in cash. The attractiveness of this offering "stems from either the corporate barter company's 'marketing advantage' – i.e. its ability to realise a better price for excess stock than its clients' ability; or its 'procurement advantage' - i.e. its ability to buy or trade for media and other 'currency' services at lower prices than its clients" (Healey, 2011: 3). While the 'marketing advantage' is attractive in theory, it has been disputed on the grounds that corporate barter traders tend to sell unused stock to discount dealers which compete with company A's existing sales channels. The procurement advantage appears rather fundamental to the value proposition of corporate barter services, otherwise resorting to a middleman would appear unnecessary. It also indirectly relates to the fungible nature of the goods and services obtained, those being media, advertising or travel. Virtually every company requires media, advertising or travel at various points of the business cycle. Further, media, advertising and travel usually have relatively high margins above some minimum capacity threshold. One might conclude that corporate barter firms are monetising media, advertising and travel, largely based on their near-universal use.

7.2.2 Retail barter

The magazine *Exchange and Mart*, devoted partly to barter, has been published in Britain every Thursday since 1868. More modern retail barter, also known as commercial barter, emerged in developed countries around the 1950s and comprises multilateral trade networks, often called trade exchanges or barter clubs. In the UK, such trade exchanges include Bartercard UK[38] and the more recent Trade Cash Network[39]. Retail barter platforms are in fact marketplaces, now increasingly automated, for member SMEs to exchange goods and services with each other using a system of mutual credit based on a common tender such as trade pounds, trade dollars or trade credits (Ormita, 2010: 20). The common tender is used exclusively within the defined marketplace and is usually pegged on a 1:X basis with the sovereign currency of the country where the barter network is located. When member companies sell goods or services they are credited with the value of the sale in the common tender; conversely when they buy goods and services from one another, they are debited the equivalent amount. Thus, trade exchanges should net out at all times as new credits are matched by new debits, enabling the multilateral exchange of goods and services among companies which act as both buyers and sellers (Ormita, 2010: 20).

The value proposition of this model lies with the potential cost efficiencies and competitiveness improvements that members can achieve by sourcing goods and services mutually. By substituting cash with credits, these firms avoid the cost of financing in traditional financial markets, but incur the cost of managing a different type of transaction, as well as any network charges. A fundamental feature of the model is the design of the common tender: it can only be 'spent' on the exchange, it cannot be redeemed for cash and there is no incentive to hold on to it. This design prompts re-participation (or reciprocality) within the system. In this model, the success of the trading network lies in the diversity of goods and services traded, especially those that are highly fungible and needed by many companies regardless of their industry; in the regular flow of trading taking place among participants; and, most importantly, in the credibility of the trade exchange and its operators as well as in the level of the trust participants have in both the exchange's functioning and viability over time. Firms looking to buy might choose this type of trading network over the standard market economy because they are cash constrained and need to use their productive capacity to purchase the goods and services they need.

Retail barter exchanges are often localised, with trade rarely expanding beyond a defined country or region. The platforms are membership-based and are usually operated by private companies which broker trade to varying degrees. Exchange operators attract participants, ensure participants are able to meet their needs through the exchange, provide account keeping services and ensure a balance of credits within the system. In turn, they generate revenue by extracting a membership fee and a fee on transactions. In the US, joining fees can range from US$300 to US$1,100; in the UK, these are substantially higher and range between £500 and £1,500. On top of this, a 10% to 20% fee typically applies on each transaction, usually charged on a 50:50 basis between the seller and the buyer, as

[38] http://www.bartercard.co.uk/
[39] http://www.tradecashnetwork.com/

well as a monthly membership or brokerage fee amounting to US$20 to US$30 (Henricks, 2005).

One of the oldest models of retail barter is the Swiss WIR Bank and WIR multilateral exchange (box 8.1) which was born out of the Great Depression and is still operational today. Box 8.1 provides an overview of the system's main features, evolution and significance to the Swiss economy.

Box 8.1 - WIR Bank and the WIR multilateral exchange

WIR is a cooperative bank facilitating multilateral trading between, and extending credit to, member SMEs. It has been operating for over 75 years and is based in Switzerland. Founded by 16 entrepreneurs in 1934, the WIR *Wirtschaftsring-Genossenschaft* (economic circle cooperative) was set up as a result of the adverse economic and monetary conditions resulting from the Great Depression. It was conceived as a way to stimulate trade and create purchasing power between participants, primarily SMEs, thereby enabling local economic growth and reducing unemployment.

Since its inception, the WIR economic circle has undergone a number of reforms and structural changes and now resembles a commercial bank driven by cooperative interests (favouring SMEs and local/national economic growth and with strong economic foundations). For example, it went from issuing interest-free credit to providing credit lines at advantageous rates compared to market rates (approximately 1.75% for members); and from charging a "demurrage" (or penalty) fee to members holding on to their WIR francs (CHW) to simply not paying interest rates on CHW deposits, thereby encouraging constant money circulation. The organisation has also expanded the range of banking services to include Swiss franc-based services rather than WIR francs alone; and has evolved from a customer base comprising primarily SMEs to opening up to the public in 2000.

WIR Bank performs different and complementary functions. First, it acts as a "**central bank**" issuing its own currency – the WIR franc (CHW), which is pegged to the Swiss franc (CHF) and released to members through loans and mortgages backed by collateral. The WIR franc comes into being on the strength of the contract with the borrower plus the willingness of a community to accept the money as a payment for goods and services, rather than through state/central bank authorisation (Wüthrich, 2004: 1). The bank regulates the amount of WIR francs in circulation - WIR francs accounted for 0.2 % of CHF M1 in 2009[40]; it also defines the rules of participation and the usage of WIR credits - e.g. WIR credit cannot be redeemed for Swiss francs; and sanctions members for illegal behaviour through exclusion - e.g. such as discounted market trading of WIR francs for Swiss francs (WIR Bank, 2011; Wüthrich, 2004).
Second, it acts as a "**commercial bank**" and as such has been subject to relevant banking regulations in Switzerland since 1936 when it was first given the status of a bank. In this capacity, WIR bank provides a range of banking products (including business loans and mortgages) to its clients in Swiss francs, WIR credits or a combination of both. WIR francs are used by participants to exchange goods and services within the WIR exchange. Since every WIR credit is matched by an equal and opposite debit, the system as a whole must net to zero (Stodder, 2009: 82).

[40] In 2009, CHW 876.3 million were in circulation (WIR Bank, 2010). For the same year, the Swiss Central Bank reported M1 amounting to CHF 377,199 million in 2009.

Third, WIR bank acts as a "**trade facilitator**" by providing the WIR platform or system through which WIR members can exchange goods and services with each other using the WIR franc as a partial or full means of payment. In this context, WIR bank also provides a range of marketing and communication services (e.g. web listings, WIR fairs) and advisory services (e.g. workshop, advice on the set-up of a WIR budget) to members to enable them to trade within the system. The WIR system is also supported by independent local members' groups (e.g. Groupement WIR Suisse Romande) that act as local networking and discussion forums throughout Switzerland.

Today, circa **one in five SMEs in Switzerland is a WIR member**[41], resulting in over 60,000 SMEs trading with each other within the WIR system, of which one third are from the construction industry (WIR Bank, 2011). The value of WIR franc-based transactions amounted to CHW 1.627 billion (WIR Bank, 2011) in 2010, representing circa 0.3% of Swiss GDP for the same year[42]. Prices are denominated in Swiss francs and can be paid using WIR credits, Swiss francs or a combination of both. While some participants accept WIR francs as 100% of the payment for their goods and services, the minimum rate of WIR francs for every transaction is 30% up to a value of 3,000 CHF; and subject to agreement between the parties beyond that threshold. The average rate of acceptance is usually between 30% and 40% of the total amount (Wütrich, 2004). Through partial acceptance, participants meet costs and liabilities that cannot be met through WIR credits such as salaries, tax and social contributions. As a result, trading within the WIR system results not only in an increase in turnover in WIR credits but also in Swiss francs (WIR Bank, 2011; Stodder, 2009).

The WIR multilateral exchange is underpinned by a strong feeling of community and trust. An obvious advantage lies in the mutual benefits arising from trading with someone that is part of the system rather than an outsider. Moreover, given its history, it is often seen as a trading mechanism sustaining local economic development and SME growth, especially as SMEs account for 98% of all companies in Switzerland (OFS, 2005).

Researchers have analysed the counter-cyclical nature of the CHW. Using 56 years of WIR data on participants, CHW in circulation, turnover and credit, Stodder (2009) demonstrates the counter-cyclical nature of WIR credit, showing that WIR credits are most likely to be accepted when ordinary money is in short supply and suggesting that the purchasing power created through WIR could become an instrument of effective macroeconomic stabilisation. Recent media pieces (see for example RAI TV, 2010) have explored the relevance of WIR exchange in the recent crisis and highlighted how participants' turnover in CHW in a variety of sectors has remained stable or increased relative to their turnover in CHF (which decreased as a result of the financial crisis).

7.2.3 Current situation

Emerging in the US in the 1950s, multilateral reciprocal trade platforms have now expanded beyond developed countries. Estimates of their exact number, type of participants and volume of trade vary. The International Reciprocal Trade Association (IRTA) indicates that some 700 retail barter exchanges exist globally as of 2009/10. While the majority of exchanges (over 500) are located in North America

[41] Based on 60,000 SME WIR members (WIR Bank, 2011) out of 297,692 SMEs censored in 2005 in Switzerland (OFS, 2005).

[42] In 2010, Swiss GDP amounted to CHF 546.619 billion according to OECD statistics, accessed August 19, 2011, http://stats.oecd.org/index.aspx?queryid=350

and Latin America, approximately 100 such trading platforms are present in Europe and the Middle East, with the remaining 100 in Asia and Australasia (Australia and New Zealand) (IRTA, 2010).

Existing multilateral reciprocal trade platforms vary in terms of membership, scale and scope of their trading opportunities, geographic reach and value of trades. The most enduring retail exchange is the Swiss WIR[43], which has been operational for over 75 years, now comprising over 60,000 member SMEs (1 in 5 in Switzerland) with the value of WIR franc-based transactions amounting to CHW 1.627 billion (WIR 2011) in 2010 and representing circa 0.3% of Swiss GDP for the same year[44].

In order to understand the interplay of the various dimensions that exist in the industry, this project surveyed existing multilateral reciprocal trading networks (see appendix 9 for more information on the survey design and results). 200 multilateral reciprocal trading networks were contacted, of which 26 responded. The survey was designed to explore the geographic reach, membership type, size and volume of transactions and type of services currently offered by the industry. 92% of the exchanges consulted described their services as corresponding to either or both retail barter and corporate barter. It is not uncommon to find exchanges providing retail barter trading opportunities alongside corporate barter services: 38% of the exchanges were proposing two or more types of barter trading opportunities to their members. In most instances, surveyed exchanges were offering retail barter and corporate media barter (35% of total) but some also offer countertrade.

In terms of membership, the majority of exchanges had either between 100 and 500 members (38%) or above 1,000 members (35%). In terms of membership type, 96% of the respondents indicated that SMEs formed the bulk of their membership. 27% also had private individuals as members; and 42% counted some large companies or listed companies in their membership. Only one included government agencies among its members, suggesting that direct government involvement is not yet significant in this industry, except in the context of countertrade.

Regarding the volume and value of trades, most surveyed exchanges use trade credits to facilitate trade between members. 31% said that the value of trading on their exchange ranged between US$-equivalent 1 and 10 million. Of these, half comprise between 100 and 500 members and 25% have over a 1,000 members. Higher value of trades (> US$10 million or equivalent) correlates to a greater number of members.

65% of respondents cover trade in one continent, primarily North America and Europe. Additional research on existing exchanges suggested that corporate barter exchanges are more easily scalable at the international level whereas retail barter tends to be more localised within a country or a region, and scalable through a web of national or localised exchanges. Of the 35% with a presence in more than one continent (in terms either of location of the exchange or geographic scope of trades), half proposed both corporate trade and retail barter opportunities.

[43] WIR Bank, http://www.wir.ch

[44] In 2010, Swiss GDP amounted to CHF 546.619 billion according to OECD statistics, accessed August 19, 2011, http://stats.oecd.org/index.aspx?queryid=350 .

7.2.4 A critical look at risks and opportunities in multilateral reciprocal trade

Multilateral reciprocal trade holds promise for businesses to maximise capacity utilisation, increase output sales and further market penetration by trading goods and services with other businesses using common tender. As one of our respondents stated: "*when a business can convert its capacity into something of value – either expenses already budgeted for, or investments aimed at supporting investment growth – the business will succeed.*"

In addition to the greater flexibility in cash flow management and possible reduction of bad debt or cash credit needs, multilateral reciprocal trade offers an alternative financing channel where interest is close to nil, and loans are provided on the basis of the potential to produce or sell capacity within the marketplace rather than on current turnover.

While the proposition is attractive, the potential for existing barter exchanges to be commercially viable, and for their members to achieve asserted benefits, depends on a number of factors. Credibility of the marketplace and its operators, liquidity within the market and trust are all critical dimensions of a successful multilateral reciprocal trade marketplace.

7.2.4.1 Set up requirements

A significant number of multilateral reciprocal trade platforms have been created in the last two decades. Yet there appear to be a very high number of failures, with one respondent working in the industry citing a figure as low as 2% for exchange success rates. This seems to suggest that there are a number of pre-requisites to establish from the start. Experts indicated that a capacity exchange would require at a minimum the following technology: an e-procurement and marketing workflow layer, a collaborative environment enabling matching of supply and demand through bidding or auction and an integration layer. In 2000, the investment required to set up such an electronic platform was significant, between US$50 million and US$75 million. Technology in 2011 exists more readily, ranging from shareware to off-the-shelf exchanges. Some interviewees believed that US$10,000 might even be a sufficient ICT budget to get started. Certainly, such a budget might support a LETS operation, and multilateral reciprocal trade systems do resemble low-cost software used in numerous e-marketplaces. However, respondents who had built successful exchanges believed that realistic budgets over the first few years for ICT should still range from US$50 million to US$75 million, because expectations are much higher and include 24/7 support, backup and global networks. Adequate capitalisation is essential to avoid early stage failure. Significant signalling of commitment is crucial for attracting mutually-reinforcing participants, ensuring trade fulfilment, managing the issuance of common tender and associated credit lines, developing marketplace liquidity and having sufficient backing for credibility, integrity and longevity.

7.2.4.2 Attracting participants

Respondents from the retail and corporate barter industry suggest that the scale of participation in multilateral reciprocal trade needs to be managed carefully. Conducting business in a cash economy implies that businesses need to conserve cash to meet liabilities relating to taxation and wages among others. Businesses appear to think carefully about how much trade they place through multilateral

reciprocal trade. Depending on the size and type of businesses, trading beyond 5% of turnover through multilateral reciprocal trade can be perceived as risky, especially for SMEs (Henricks, 2005). For example, if a firm commits too much of its trade to multilateral reciprocal trade networks it may struggle to generate cash flows which are necessary to meet sovereign currency liabilities such as tax contributions and employee salaries.

Evidence provided by existing exchanges seems to suggest that local exchanges should target SMEs and start ups as these tend to have a greater need for local goods and services. Targeting localised SMEs reduces credibility issues (participants can "see and visit" one another), and helps to build localised critical mass and balance. While the average value of transactions and the overall volume may be fairly low, localised trades can be frequent. Respondents from the retail and corporate barter industry suggested that the owners of SMEs are fairly easy to access and also faster to convince of the value proposition. Conversely, within large corporations, conflicts of interests may arise between marketing and sales departments who might see multilateral reciprocal trade as positive, and accounting, treasurers and procurement units more likely to perceive it as unusual or a costly way to conduct business. Two interviewees highlighted conflicts between sales people and multilateral reciprocal trade platforms. When payments for sales on these trading platforms were not incorporated into sales commissions, they were seen as reducing opportunities for sales people. Nevertheless, if the value proposition of multilateral reciprocal trade can be made clear, these obstacles should not prove insurmountable.

Proponents of emerging propositions for multilateral reciprocal trade suggest that targeting large corporations may be more effective in the long run. While more efforts may be required to convince early adopters, trade is likely to be more profitable given the relatively higher value of transactions, although these may occur less frequently (since procurement by larger firms tends to be in made greater quantities for longer-term time periods than by smaller firms). Moreover, the prospect to reach out to related industries and the supply chains of big players makes signing up these kind of 'anchor tenants' even more attractive. Large corporations tend to play a 'wait and see' game, especially when confronted with radical and unusual propositions, but if a stake in an exchange that met their needs induced them to participate actively, this could be a promising strategy for a global multilateral capacity exchange.

7.2.4.3 'Tradeables'

Companies producing goods and services which are perishable and/or needed by virtually any business are good candidates for a capacity exchange because of their incentive to maximise the value of their capacity. Suitable capacity includes hotel rooms, airline tickets, media and advertising, restaurant meals and office equipment, among others.

A capacity exchange operator's goal is to get good quality goods and services and to make them available to members as quickly as possible. Issues around the quality of goods and services, as well as their pricing, have been reported on a number of existing exchanges. Quality is central to a credible offer on such an exchange. Some respondents suggested that an escrow agreement (like those used for cash transactions) managed by the operators could incentivise quality and delivery of

the traded goods and services. Ideally, prices operated on a capacity exchange should be equivalent to market prices. Under-pricing usually reflects poor quality goods; overpricing suggests that participants do not trust the exchange or the common tender. Given that the majority of multilateral reciprocal trade platforms price goods and services at market rates, pricing on the exchange can be an important indicator of quality and confidence in the market to the extent that it differs significantly from cash-world prices.

7.2.4.4 Brokerage or automation

Order fulfilment is central to the success of a capacity exchange. The degree to which existing retail and corporate barter trade exchanges can be automated has attracted a lot of attention within and outside the industry. During the internet boom there were a number of well-financed attempts to launch fully automated online trading platforms with no human brokerage. The intention was to emulate eBay in the B2B sector (Barter News Weekly, 2009). A well-known, and often cited, example is BigVine.com, which failed 18 months after being launched despite significant investment from venture capitalists and backing from American Express (Flaherty, 2003). Respondents from the retail barter sector frequently highlighted this example and strongly suggested that is failure was due to the attempt to fully automate capacity exchange trading. The incumbents who engaged with this project insist that the potential for automation of multilateral reciprocal trade is limited.

In line with this assertion, most respondents agreed that agency brokerage is an important feature for multilateral reciprocal trade. Automation only goes so far, particularly with heterogeneous products and services. Most respondents also agreed that a completely automated capacity exchange was possible in theory, but that, until there was a sufficient and sufficiently regular supply of goods and services, it would require brokerage to maintain momentum and to assist members to find trading opportunities. For example, since an exchange may not always be able to offer participants their first choice in terms of desired goods and services, the broker's role is to make sure that they can get other goods and services that they need. Brokers in B2B multilateral reciprocal trade provide important customer services that create and manage expectations; facilitate trade, clearing and settlement; monitor transactions and negative positions; and contribute to building trust on the exchange. While the degree of brokerage may vary over time, most respondents did not believe a capacity exchange could ever become fully automated.

7.2.4.5 Common tender issuance

Trust and liquidity are two key requirements for any means of exchange. Common tender issued by a capacity exchange needs to be widely accepted among participants and trusted to hold value over time. In today's multilateral reciprocal trade industry common tender is theoretically backed by commodities, i.e. the goods and services traded on the exchange. In practice, more often than not, a number of problems arise in relation to the issuance of common tender, suggesting that, as one respondent commented, "*acting as a central bank while not being regulated as one*" can be problematic. To date, operators of retail and corporate barter exchanges are not regulated with respect to the issuance of the common tender, except for the WIR commerce network which has been subject to banking regulation since 1936.

A major issue around common tender today relates to imbalances between the volume issued and the value of goods and services traded within the exchange. Allegations have been made of deficit spending (see for example Think Barter LinkedIn Group, 2011), namely when operators issue common tender that is not backed by goods and services, spending it with participants to generate activity or to attract new participants. This leads to members sitting on positive account positions with limited incentive to trade within the exchange as they have no credit line to repay. Participants tend either to stop trading, to accept the common tender for partial payment of a transaction or to overprice the goods and services in common tender-equivalent compared to cash prices. Such behaviour does not benefit the exchange or its members.

Ultimately, risks around the issuance and management of common tender supply link to the risk of its potential devaluation; and to the fact that operators cannot currently be held accountable in the event of an exchange going bust. Some respondents suggested that the use of a single common tender across several exchanges could be dangerous as "*one weak exchange can bring down the network of exchanges if they're all using the same currency*".

7.2.4.6 Regulation

Regulation of modern and organised barter platforms is limited. While trade associations such as IRTA (international but with only 86 members, out of some estimated 700 to 800 target members) and NATE[45] (North America only) have attempted to develop standards of conduct through certification schemes, their membership is only partly representative of the industry and they lack enforcement tools. While trading standards and the fiscal treatment of retail and corporate barter transactions is set out in most developed countries – see table 8.6 – the issuance of common tender is not.

Table 8.6 – Accounting and tax implications of barter-type transactions

Country	Regulation reference	Description
United States	Tax Equity and Fiscal Responsibility Act (TEFRA) (1982)	Trade exchanges are classified as 'third party record keepers'. As such they are required to report the sales for the year to the Internal Revenue Service (IRS) and to participants on a form (1009B). All tax payments are applicable as if the trade credit revenues and purchases were made in cash.
Canada	IT-490 (1982)	Barter transactions are within the purview of the Income Tax Act and their cash equivalent value must be reported as income. (Canada Revenue Agency, 1982)
Australia	NAT 9748 (2011)	Barter transactions are assessable and deductible for income tax purposes to the same extent as other cash or credit transactions. (Australian Government Taxation Office, n.d.)
United	HMRC guidance	The VAT treatment is the same as for part-

[45] http://www.natebarter.com/

Kingdom	on VAT treatment of barter transactions	exchanges. VAT must be accounted on the amounts that would have been paid for the goods or services if there had been no barter and they had been paid for with cash. (HMRC, n.d.)

Fraud or other confidence issues on one exchange affect the entire industry. Respondents suggested that endorsement of multilateral reciprocal trade platforms or independent third party standards set by governments would add to the credibility of the multilateral reciprocal trade industry as a whole.

7.3 Concluding remarks on existing forms of multilateral reciprocal trade

Multilateral reciprocal trade is not uncommon though precise figures are not available. Current forms of multilateral reciprocal trade include countertrade and organised forms of barter, such as corporate barter and retail barter. Countertrade is a way to structure international sales when conventional means of payment are difficult, costly or nonexistent. Countertrade transactions are usually large volume and large value. There is scope for third party specialists or marketplaces to improve business practices and broker such transactions to the benefit of interested governments, especially in emerging and developing countries.

The multilateral reciprocal trade industry faces challenges. It relies on high degrees of trust, yet is not well understood by outsiders. Allegations of fraud (see, for example, discussions on Think Barter LinkedIn Group, 2011)[46] are associated with some issuers of common tender. The potential for retail and corporate barter exchanges depends on the credibility of the marketplace and its operators, the liquidity within the market and the trust participants place in the common tender and the system. Chapter 9 explores in greater detail the role and design of common tender in multilateral reciprocal trade.

[46] Interviewees active in the corporate and retail barter sector who participated in this research cited anecdotal examples of retail and corporate barter exchanges failing due to deficit spending on the part of the exchange operator, as a result either of ignorance or wilful abuse.

8 Common Tender in Multilateral Reciprocal Trade

This chapter describes how common tender is currently employed in multilateral reciprocal trade and the different types of common tender in existence. It considers the factors necessary for common tender to endure within a trading community and examines the costs, benefits and risks of different approaches to common tender issuance, design and management.

Proponents of multilateral reciprocal trade assert that the issuance of common tender, a means of exchange other than sovereign currency, not only underpins the feasibility of multilateral reciprocal trade but also allows trade participants – and governments – to avoid the credit restrictions of sovereign currencies. During the Great Depression, for example, an enormous variety of scrips and currencies emerged. Harper (cited in Timberlake, 1987a: 987) lists these as:

> "(1) issues by local governments due to decreases in tax revenues; (2) issues by chambers of commerce after local bank failures as a means of "corralling as large a proportion of the depression diminished volume of business as possible for their membership"; (3) issues by "home-owned stores as a weapon against…chain- store competition"; (4) issues by "barter groups as a means by which the unemployed could more conveniently exchange services"; and (5) issues by charitable organizations to needy persons as "commodity orders" for foodstuffs."

During the periods of financial crises since 2008, there has been increased interest in private scrips and currencies, quite similar to Harper's (3) and (4) above. The UK Federation of Small Businesses (2011) states that 73% of small businesses have been paid late in the year and the total amount owed to small businesses is estimated at £24 billion (Financial Management Centre, 2011). If common tender could reduce working capital pressures it could materially improve business fortunes. Taking things a step further, one person remarked that the financial crisis might be due to "having too much of the wrong kind of credit, fiat currency". One of the benefits of capacity exchanges might be the use of previously unpledgeable assets to create more diversity and robustness in the global economy.

8.1 Common tender and trade

The principal value proposition of common tender in multilateral reciprocal trade is that it provides an endogenous source of credit in trade.[47] In order to fulfil its function as a source of credit, it must be designed in such a way as to encourage re-participation, so that every buyer is a future seller and every seller a future buyer. In most instances, common tender used in multilateral reciprocal trade is not convertible to sovereign currency, since this money could then be taken out of the system and used in other markets, or for purposes other than trade (such as salary payment or tax contributions). Common tender is usually restricted to redemption of goods and services within the membership group or community where it is issued. In order to fulfil its function as a means of exchange, the common tender must be legal (i.e. specified in the contract as the means of exchange accepted for

[47] Credit arises when the purchasing power is transferred from present to future. See Wray, 1990. See appendix 18 for an interesting example of credit provision linking multilateral reciprocal trade and Islamic finance.

payment obligations); and trusted (i.e. participants need to have confidence in its future value and usability).

In order to attract participants to a system in which there is no cash-out option, common tender used in multilateral reciprocal trade typically has no interest rate, meaning that members have no incentive to hold on to it and are more likely to trade when they have a surplus. Such a design is intended to keep trading levels high. The purpose of common tender in trade is to store value until a trading partner is found, and not to do so in anticipation of a real or speculative return on capital. Common tender is thus money as a means of exchange, rather than money as a source of capital. Clearly, a business that is not credit constrained would not be particularly attracted to such common tender, if it could sell its goods and services for cash and then earn interest on that money while waiting to buy other goods and services. For those businesses looking for alternative credit sources, however, the design of common tender would presumably be more attractive.

There are practical and computational considerations that argue for the use of common tender in the context of multilateral reciprocal trade. For example, considering a platform with 100 members each trading a different good or service, the existence of means of exchange requires an exchange rate to be agreed for each of the 100 items, whereas without it an exchange rate needs to be agreed for all 4,950 pairings of goods and services (assuming bilateral trades only).

8.2 Common tender and community

The use of common tender as a means of exchange in B2B trade is an investment in the persistence of that trading community. In order for common tender to continue to have value as a means of exchange in B2B trade it is necessary for the community in which that common tender is being used to persist. In order to endure, the community must exhibit the following six attributes:

- common history and purpose: the fundamental reason or passion for joining is clear - increasing trade;
- shared knowledge and culture: there is a common cultural context, principally risks and rewards determining "how we decide to do things around here";
- common practices: there are known procedures and benchmarks for operations and conduct; shared jargon helps common practices proliferate;
- co-location in space and time: there is shared physical and virtual space with known periods of interaction;
- common action: lobbying as a group for their own interests. There is intense lobbying of regulators, governments and trans-national organizations in order to ensure the proper functioning of markets;
- co-created future: communities have shared visions of the way they could work, e.g. the insurance ICT community might envisage an all-electronic world of straight through processing and real-time risk assessment.

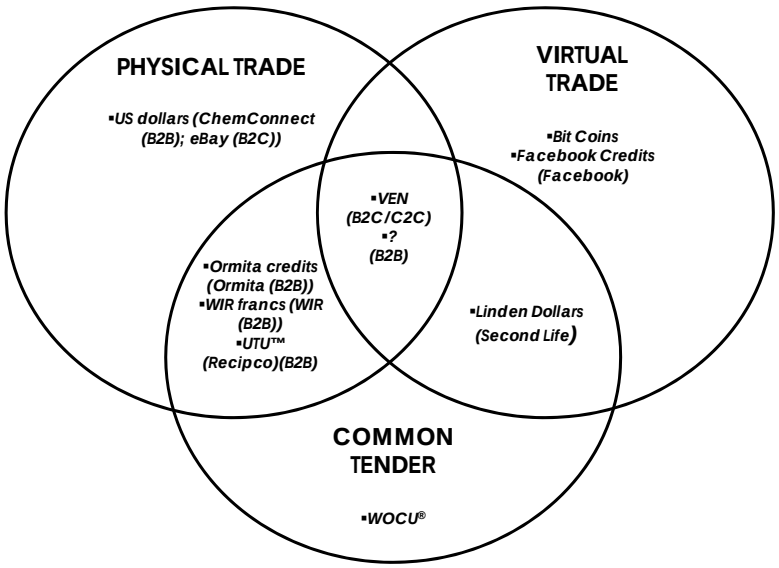
The durability of the community is not sufficient for the survival of the common tender, however; other factors influencing the potential for common tender to be durable within a trading community are explored below.

8.3 Types of common tender

Types of common tender (including those that are not necessarily used to facilitate multilateral reciprocal trade) tend to differ on a number of features including their backing mechanisms; membership; exchange rate; and ratio of cash/common tender acceptance within trading networks. By way of comparison, the UK economy, with a GDP of £1.336 trillion, has approximately £60 billion of notes and coins in circulation, i.e. the economy needs 4.5% of its GDP in notes and coins. Broader measures of money take into account credits and debits, i.e. bank balances; and the comparison between sovereign currencies and common tender in terms of quantity and velocity could use more research. Common tender design parameters can have large impacts. Further, small amounts of common tender in circulation can sustain a significant trading network.

While common tender can be used in open systems - where it can be converted into cash (e.g. Bitcoins and Linden Dollars) – these systems are noticeably not B2B communities. Appendix 10 outlines some examples of common tender distinguishing their key features. To date, most B2B multilateral reciprocal trading networks adopt a common tender design where there is no cash out option and no interest rate. Figure 9.1 illustrates how some of the common tenders detailed in appendix 10 interact with physical and virtual trade in both the B2B and business-to-consumer (B2C) segments. A notable gap is a common tender linking physical and virtual trade and currencies in the B2B segment.

Figure 9.1 – Physical trade, virtual trade and emerging types of money



It should be noted that most of the tenders outside of the physical trade space are still in their youth and their interaction with physical and virtual trade is constantly evolving.

Box 9.1 – Ven digital currency

Ven is a digital P2P currency launched in 2007 by the social network group Hub Culture. It first appeared as an application on the social networking website Facebook.[48] In 2011, Hub Culture released an open API (which facilitates interconnectivity between websites) allowing Ven to move across the web as an open digital payment ecosystem called Ven Money.[49] Ven is traded by members within the Hub Culture network (25,000 people as of September 2011) for "knowledge, goods and services"[50]. It can be used both online or in any of the physical Hub Pavilion locations around the globe.[51] In 2009, Ven was re-structured as a basket of currencies, commodities and carbon futures and, in 2011, became the first digital currency to be used to price a carbon offset trade.[52]

Ven's proponents claim that its basket structure allows it to be used as hedging tool against exchange rate volatility when trading commodities; and as a signal for market-led integrated carbon pricing at the global level.[53]

Since September 2011 Ven is available on Thomson Reuters' global desktops and data terminals meaning that live pricing will be available in the digital currency. It is assumed that this will open a number of avenues for the currency to be used by organisations across the world and greater visibility within markets.[54] Over time Ven is expected to "help link capital market liquidity directly to consumers, opening opportunities for social finance initiatives, micropayments, and capital liquidity access that complement existing structures in partnership with banks, NGOs and financial institutions around the world"[55].

8.4 Backing common tender

The attractiveness of any means of exchange is likely to be enhanced if it is 'backed', i.e. readily convertible. One way of backing money is using a commodity or basket of commodities. The most well known example of a commodity used for backing purposes is gold which, throughout the history of money, has "provided a psychological and material safe haven for people all around the world" (Cooper et al, 1982: page 156). Common tender issued on a capacity exchange is implicitly 'backed' by members. Such backing is contingent, however, not only on the creditworthiness of the participants, but on the wider trust that participants place in the system and its membership – that it will endure over time and that participants will supply the goods and services promised.

In theory, common tender should be less subject to inflation and volatility than a sovereign currency because it is backed by goods and services traded. Such advantages are, of course, tied to the management of the money supply, as in the cash economy, and also the management of the exchange itself, which will ensure that the common tender will actually be convertible into the goods and services

[48] http://www.hubculture.com/groups/237/projects/427/wiki/
[49] http://www.venmoney.net/
[50] http://www.hubculture.com/groups/237/projects/427/wiki/
[51] http://www.hubculture.com/pavilions
[52] http://www.hubculture.com/groups/237/news/562/
[53] http://www.finextra.com/news/fullstory.aspx?newsitemid=22985
[54] http://www.mondovisione.com/media-and-resources/news/hub-culture-launches-ven-digital-currency-calculated-and-distributed-by-thomso/
[55] http://www.mondovisione.com/media-and-resources/news/hub-culture-launches-ven-digital-currency-calculated-and-distributed-by-thomso/

backing it. The practice of pegging the common tender to a sovereign currency introduces exogenous dynamics such as exchange rate volatility and price inflation, thereby contradicting one of the suggested advantages of using a common tender. The extent to which a capacity exchange could provide a market that is separate from such factors depends on both trust and scale. During the research it became clear that capacity exchanges can be largely self-financing, or treated as typical equity start-up ventures or franchises.

One respondent pointed out that murabaha finance was using existing physical transactions on commodity exchanges to cope with the strictures of Islamic finance. For a capacity exchange seeking to grow rapidly, it might be possible to use murabaha finance to back an exchange's common tender (see appendix 18).

8.5 Common tender – acceptance and value over time

The viability of a common tender is conditional on the trust that participants place in it and the prospect of the system underlying the common tender continuing over time. A number of aspects need design and control, including:

- issuance of common tender by the exchange or the operator and the balance of common tender supply with goods and services traded;
- control of credit for new members;
- regular review of negative balance positions of members and of the default rate of participants;
- building confidence in the pricing policies and quality standards of participants to avoid too much discount trading or overpricing in common tender compared to cash.

In the absence of third party oversight of the issuance of common tender, trade exchange operators can build up members' trust in their exchange and in the common tender in various ways, including ostentatious security; possibly backing common tender with commodities or sovereign currencies; mutual insurance, third party assurance, or reinsurance; market makers providing liquidity; and calls on future receivables (Moore, 1984). Another respondent also suggested that common tenders "*could be indexed against each other to reinforce the reputational element that makes them more robust*".

Two features of a common tender deserve particular attention: the value of the common tender, including the exchange rate between the common tender and sovereign currencies; and the appropriate ratio of cash/common tender accepted in trade.

In discussing the value of a common tender and its exchange rate, it is important to remember that common tenders used in organised barter and other forms of multilateral reciprocal trade are normally pegged to the sovereign currency to facilitate valuation, accounting and tax treatment. This does not mean that their value is equal to that of the sovereign currency on a 1:X basis. In fact, the value can actually be significantly lower if, for example, trade exchange operators use deficit spending – the creation of new credits un-backed by goods and services - to attract new members. With common tender, one needs to trust the issuer and the entire issuer's system and community. As a respondent stated, "*the value is dictated by the marketplace so it doesn't really matter how you construct your trade unit (pegged to sovereign currency or otherwise) because its value lies in the demand*

for the goods in the system". Situations where participants overinflate prices in common tender on a capacity exchange compared to cash-world prices are also reflections of the lack of trust in the system by participants and indicate that inflation is possible on a capacity exchange even if separate from the inflationary pressures in the mainstream economy.

The appropriate ratio of cash/common tender to accept on a capacity exchange is disputed. The basic argument is between purists who believe common tender should be used on its own (e.g. IRTA), and those who believe that a mixture of common tender and cash works better (e.g. Swiss WIR). Purists feel that mixing sovereign currency with common tender in transactions leads to variable and uncertain acceptance across the membership, ultimately undermining the confidence participants may have in both the system and the common tender. Proponents of mixed means of exchange believe it helps leverage sales in both common tender and sovereign currency, while simultaneously allowing members some flexibility to manage their common tender budget. The ratio of cash/common tender is part of the design of a capacity exchange. In order to explore further what the optimal ratio might be, and to analyse the impact on a capacity exchange of fluctuations in 'faith' in the means of exchange, a simulation was conducted in association with University College London, details of which are contained in appendix 11.

The simulation experiment provides some initial insight into one element of the design of a capacity exchange. It demonstrates that trade values tend to be stable at extremes (either 100% sovereign currency or 100% common tender); whereas using a combination of common tender and sovereign currency as the means of exchange appears to create a complex relationship between acceptance and faith in common tender and sovereign currency. As evidenced in geographic areas where multiple currencies co-exist, this complexity can be surmounted if the benefits of trade are sufficient. More specifically, as the simulation demonstrates, the ratio of acceptance of cash/common tender is likely to impact significantly on whether the capacity exchange is perceived as a complementary or wholly independent trading avenue for participants.

8.6 Common tender: one or many?

A further question is whether a single universal common tender might be the 'best' option for multilateral reciprocal trade, particularly in the sense of minimising transaction costs; or whether every capacity exchange ought to have its own type of common tender. The former seems simpler: if everyone shared the same currency then participants ought to find it easy to compare value across exchanges and there would be no foreign exchange costs and it would also be easier to arbitrage across capacity exchanges. Conversely, it might be argued that different kinds of capacity exchange should 'float' one against the other so that trades find their proper market value. One key factor in using multiple forms of common tender across multiple exchanges is the potential difficulty in developing membership trust across platforms that possibly have different purposes, members and standards. Whether one common tender or a number of them are used depends to some extent on whether a top-down or bottom-up path is taken.

Through a self-organising, bottom-up, community-based approach a set of markets might emerge that interconnect through a capacity exchange and use a top-down

unit of account to 'keep score' across market boundaries, while all of the in-market transactions result in the exchange of the equivalent of local currencies. In some markets these may have an external reference, such as man-hours or kilowatt-hours, while in others they may have an entirely intrinsic value, rather like virtual gold pieces in computer games. The drivers for these arrangements are transaction costs and stability, and the success of a common tender, or network of common tenders, will depend on the extent to which costs can be reduced and stability can be maintained.

8.7 Concluding remarks

As a means of exchange, rather than a source of capital, common tender has the potential to create an alternative financing route to allow organisations to trade without relying solely on access to traditional forms of credit. The potential for common tender to be successful as a means of exchange lies to a great extent in the trust which participants place in its endurance over time. Since common tender in B2B trade tends to be backed by the goods and services of participants it is clear that the trading community also plays a role in ensuring the viability of the common tender by fulfilling transactions; and equally, the exchange operators must not over-issue common tender credit and inflate prices. The appropriate ratio of cash to common tender to use in multilateral reciprocal trade is not clear. While the simulation carried out for this research appears to indicate the benefit of trade taking place entirely in either cash or common tender – since trade values tend to more stable at the extremes of 100% cash or 100% common tender, the most successful retail barter exchange, the Swiss WIR, operates though a mixture of Swiss Francs and WIR francs. The greatest concern of those in the existing multilateral reciprocal trade industry who engaged with this research is the problem of over-issuance of common tender by exchange operators and the subsequent reputational damage caused. As well as the design of common tender, participants must also consider the structure of the capacity exchange which issues it. Chapter 10 explores the dimensions of capacity exchanges, and the possible models that a capacity exchange might take, in more detail.

9 Capacity Exchange: Options, Feasibility and Potential

This chapter seeks to answer the question of whether there is an optimal model for a capacity exchange. It explores some emerging and innovative propositions for multilateral reciprocal trade and also examines key factors influencing the development of capacity exchanges such as industry type, participant size, addressable market, geographic extent and the nature of goods and services.

9.1 Innovative proposals in multilateral reciprocal trade

In the last 15 years, a number of new proposals for multilateral reciprocal trade have emerged with prospects for international scale and, in some instances, expanding across existing exchanges. Many of these architectures are based on new ideas for how common tender in multilateral reciprocal trade can be designed and used.

9.1.1 Universal Currency[56]

Universal Currency (UC) is 'a trade exchange for trade exchanges' where members comprise existing trade exchanges that can trade with each other using a unique common tender accepted across multiple exchanges. It was established by the International Reciprocal Trade Association (IRTA[57]) in 1997[58]. Universal Currency currently has 100 member companies, 86 of which are also members of IRTA. It is overseen by a UC Committee formed of eight trade exchanges which meet regularly to review new member applications, credit line requests, the status of member accounts and ideas to promote additional trading.[59]

Every existing trade exchange normally issues and uses its own common tender as a way to facilitate trade within the exchange and to retain participation. While some exchanges, especially in the US, have concluded agreements for mutual acceptance of their respective common tender in order to increase the goods and services available to members, the Universal Currency attempts to further increase the efficiency of multilateral reciprocal trade, acting as a 'third party central accounting centre'[60] for its corporate and retail barter member companies. The benefits put forward include the possibility of expanding trading opportunities.

The innovative value proposition of the Universal Currency lies in the attempt to gradually evolve from a start-up retail barter exchange towards an internal monetary system where the common tender used to facilitate trade becomes universal in terms of acceptance, credibility and use.

9.1.2 Ormita Commerce Network[61]

Established in 2001, Ormita was originally a software provider for corporate and retail barter trade platforms around the world. It has subsequently acquired some of those platforms in its own right and now operates a franchise model allowing members to trade across an international network of exchange platforms. Ormita acts primarily as an agency broker, and sometimes as a principal broker, between its members.

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[56] For more information, see http://www.ucci.biz/
[57] International Reciprocal Trade Association, http://www.irta.com/
[58] The website indicates that UC was created in 1988. However, interviews with IRTA representatives in the media and for this report confirm 1997 as the establishment date.
[59] "About UC"- http://www.ucci.biz/
[60] "About UC"- http://www.ucci.biz/
[61] For more information, see http://www.ormita.com/

Ormita helps companies to leverage existing assets to create new income, investments and other benefits. Ormita claims to be the second largest privately held barter exchange operation by international trade volume. Its worldwide network handled annual transactions worth over US$2.6 billion in 2010, with a presence in over 54 countries and offices in 24 countries. Ormita uses a very broad definition of barter, claiming that the top spot is held by Deutsche Bank's countertrade desk in London.

Ormita works with governments, state owned enterprises, Fortune 500 companies, publicly listed companies and a handful of carefully selected private corporations. As of July 2011, Ormita counted over 218,700 members, of which government organisations account for 15%, media companies for 20% and other corporate entities for 65%. Although government organisations form the smallest part of the network's membership, they make 63% of transactions. The large government volume is due to Ormita providing countertrade services. Trades involve commodities primarily but rarely services, apart from media, as these are difficult to value, especially across borders. Trading is not automated; every transaction is brokered. Ormita's business proposition is intended to be complimentary to existing trading mechanisms and focuses on an end-to-end supply chain.

The innovative value proposition of Ormita lies in both its business model and the range of services it offers. This strategy – a variation of the franchise model – allows Ormita to develop an international network of exchange platforms. Ormita thus secures local partners with experience of doing businesses in their respective country's legal and socio-economic frameworks and offers them and their members trading opportunities at the international level. Brokerage efforts are significant. For example, one trade between a manufacturer of televisions in China and a Middle Eastern bank used advertising space that the bank owned to pay for the television screens it required. In turn the television manufacturer in China was able to source LCD screens with the credit it had earned by supplying the television to the bank in the Middle East. Offering wide-ranging trading opportunities and support services, including hospitality and travel, alternative funding for start-ups, commodity import offers, export assistance and countertrade, in addition to conventional corporate and retail barter, Ormita appears equipped to meet a large portion of the various demands in the multilateral reciprocal trade industry.

9.1.3 Recipco™[62]

Recipco™ proposes an alternative market discovery and transaction solution for non-monetary trade enabling participating organisations, including governments, corporations, non-governmental organisations and international organisations, to increase sales, reduce expenses and reduce dependence on cash and credit (Recipco, n.d.a). Their solution comprises a global electronic marketplace – Recipco™ Capacity Exchange; a common tender – the Universal Trading Unit (UTU™); and a member-backed facility – RecipcoClear – which ensures the integrity and liquidity of the UTU™ with the available capacity of its members. With a first official transaction in 2010 involving an international hotel group in China (Recipco, 2010), Recipco™ is in the process of developing activities worldwide and has recently established its headquarters in London (UK).

[62] Recipco™ is a sponsor of this report - for more information see http://www.recipco.com/

Recipco™'s offering differs from conventional retail and corporate barter in that it focuses on what they term 'global non-monetary trade', with the aim of attracting Fortune 500 companies. Recipco™ proposes trade in a way that provides members with a new, direct source of working capital from their available capacity; leverages different contribution margins with a view to lowering operating costs and increasing revenue through the acquisition and sale of goods and services; and enhances margins for high liquidity producers by using their common tender – the UTU™ – to sell to, and procure from, high margin producers. In other words, a producer from a high-margin sector can maintain or improve profitability even while reducing margins when there is an increase in capacity utilisation beyond that corresponding to a determined price. Conversely, a producer from a high-liquidity, low-margin sector can improve its margin by shifting part of its production from the very tight cash market to the Recipco Capacity Exchange™ where it can sell at a premium using UTU™ (Recipco, n.d.a). Equally, as member companies of RecipcoClear have a direct stake in the success and continuity of the Recipco Capacity Exchange™, they are inclined to ensure continuous trading.

Recipco™ offers an opportunity for companies to access alternative sources of financing or credit by converting available capacity into a means of procurement (Recipco, n.d.b). Trading through the Recipco Capacity Exchange™ enables the exploitation of margin differentials. Unlike most common tender in the retail and corporate barter industry, the UTU™ is not simply defined by the cash-equivalent value of the goods and services traded but by an algorithm taking into account weightings of major sovereign currencies. As trade volume increases and participation expands, it is anticipated that the value of the UTU™ will be defined by the purchasing power of members of RecipcoClear. In addition to benefits relating to increased sales, capacity utilisation improvements, operational cost reduction and market share gains, Recipco™ claims to offer an innovative solution for capacity management for both high-margin and low-margin producers (Recipco, n.d.a).

9.2 Towards an optimal capacity exchange model: dimensions and options

Table 10.1 outlines the critical dimensions for the design and operation of a capacity exchange. The discussion which follows considers the options identified for each dimension.

Table 10.1 – Trading capacity: dimensions and options

Dimensions	Options
Industry type	High-margin
	Low-margin
Participants	Listed companies and multinational organisations
	Small and medium sized enterprises (SMEs)
	Government departments
Addressable market for capacity	Excess/unused capacity
	Available capacity
	Excess/unused capacity and available capacity
Range of goods & services	Homogeneous
	Heterogeneous
Scope	Cross-industry

	Industry specific
Geographic reach	Local
	National
	International
Trading model	Directed trades (brokers/ market makers)
	Automated trades
	Trade brokerage combined with degree of automation

9.2.1 Industry participation – market structure, margin profiles and appetite

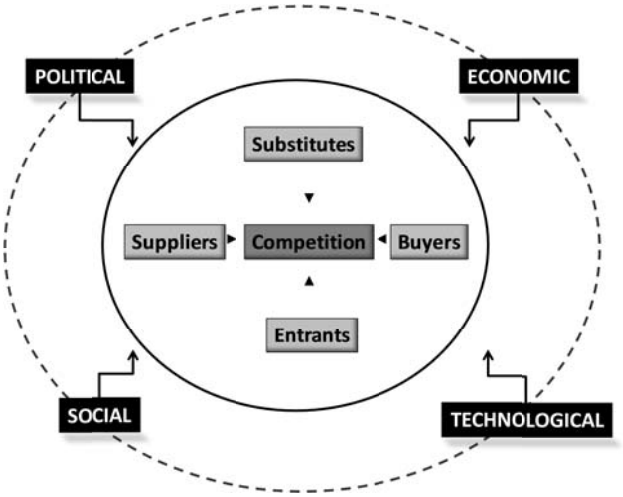
The value proposition of a capacity exchange is likely to depend most on three elements:

- the market structure – monopoly, oligopoly or near-perfect competition among multiple players;
- the margin profile – low or high depending on the profit margin compared to costs and revenue;
- the nature of goods and services – highly fungible, standardised, perishable, bespoke.

9.2.1.1 Market structure

Following Porter (1985) the competitive intensity of a market may be defined by examining five forces – the entry of new competitors, the threat of substitutes, the bargaining power of buyers, the bargaining power of suppliers and rivalry among existing competitors. A wider context is provided by considering the political, economic, social and technological (PEST) environment. Figure 10.1 provides a stylised representation of market structure.

Figure 10.1 – PEST and Five Forces



Source - adapted from Porter, 1985

The relationship between the five forces and the market structure of an industry is likely to influence the appeal of a capacity exchange to that industry. Markets have many imperfections (see appendix 12), most notably for this discussion, monopoly and oligopoly. A monopolistic market structure is characterised by having a single producer or seller of a product. Barriers to entry in such a market are

usually very high and include prohibitive costs. Other restrictions could include government intervention to control the market, patent restrictions or even social restrictions such as "water cannot be privatised". The absence of competition implies that prices are determined by the producer but are constrained by the market demand for the product at that price. For them, the appeal of a capacity exchange is limited.

Oligopolistic markets comprise a limited number of organisations and, like monopolies, have high barriers to entry. With little differentiation among products, participants must maintain similar prices in order to remain competitive. For a capacity exchange to be attractive for such industries it would need to attract the participation of all the dominant industry players.

The relationship between market structure and excess capacity provides an indication of the extent to which certain industries would be inclined to participate on a capacity exchange. For example, firms with a monopoly can "adjust their capacity to the expected long run equilibrium price" (Esposito and Esposito, 1974: 188) in which case excess capacity does not develop. Since entry is effectively blockaded, the capacity output defined by the monopolist is left undisturbed (Esposito and Esposito, 1974). Even if the monopolist finds a way to exploit excess capacity to its own advantage, for example to provide a barrier to entry, it is unlikely that trading it on a capacity exchange would be part of the strategy to deter potential participants.

The theoretical opposite to a monopoly is perfect competition where there are many buyers and sellers, products are similar with many substitutes, information is perfect and few or no barriers to entry exist. Prices are therefore determined by supply and demand. While such markets do not exist in a pure form, many markets approach perfect competition. Given adequate competition among existing participants, easy entry for new participants and a variety of substitutes for products, participants in such a market are likely to look actively for new sales channels. A capacity exchange is therefore likely to be attractive to the extent that it provides participants with a competitive edge.

Further, competitive markets "experience the entry of new firms and the overexpansion of existing firms because the elasticity of price expectation of each firm is one. Consequently, the expanded industry capacity output exceeds quantity demanded at the long-run equilibrium price and aggregate industry capacity is underutilised" (Esposito and Esposito, 1974: 188). In other words, competitive markets have excess capacity. Capacity exchanges seem likely to appeal most in competitive markets and to have limited appeal for monopolistic industries.

9.2.1.2 Margin profiles

The commercial attractiveness of a capacity exchange is likely to depend on the marginal costs of different industry participants for every extra unit sold. A company's profit margin can be defined as *(sales revenue - cost of goods sold)/sales revenue* (Min and Wolfinbarger, 2005). A high margin industry implies greater profit compared to costs, while a low margin industry will exhibit low profit compared to costs for an extra unit sold. Many factors, beside production costs, will affect the profit margin of an industry. These include investment requirements,

product pricing, type of market, market share of the company and conditions of production.

Figure 10.2 is an attempt to identify potential industry participants, based on the nature of their products (high, discrete or low perishability) and their margin levels (high, medium or low). The buyer/seller matrix indicates the potential interest of each sector in the goods and services of the other, given that on a capacity exchange all participants are buyers and sellers. It seems essential therefore that a buyer's goods should be in demand by other participants and vice-versa.

Figure 10.2 – Buyer/Seller matrix

					BUYER							
	COMPANY	Nature of capacity	Perishability (supply/ demand)	Margin	Airline	Shipping	Media/publishing	Telecommunications	Power generator	Paper	Printer	Infrastructure/ construction
SELLER	Airline	Seats	H	H		√	√	√	√	√	√	√
	Shipping	Containers/ block cargo	H	M/H					√	√	√√	√√
	Media/publisher	Advertising	H	H	√	√		√				
	Telecommunications	Network bandwidth	C	H	√	√	√√		√	√	√	√
	Power generator	Electricity	C	M						√√	√√	√
	Paper manufacturer	Paper	D	L/M							√	
	Printer	Printing services	D	L/M	√	√	√√	√				
	Infrastructure/ construction	People and tools	D	L		√		√√	√√	√√	√	

Key:

- **Perishability**: the speed with which the product or service 'perishes'; and at which demand for those products and services 'perishes'.
  - High (H): the value collapses to (near) zero close at a natural expiry point;
  - Continuous (C): a product or service that delivers continuously with continuous 'expiration';
  - Discreet (D): products or services delivered in discreet batches but with no natural expiry point.

- **Margin**: the likely gross margin close to expiry.
  - High (H): very low marginal costs;
  - Low (L): higher marginal costs for delivery.

- **Buyer**:
  - [blank cell]: no obvious reasons for continuous material level of transactions;
  - '√': expectation of reasonable levels of transactions;
  - '√√': an obvious high level of continuous demand.

- Shaded areas: higher degrees of compatibility between buyer and seller incentives.

Industry margins are at least as important as perishability. There are numerous correlations between perishability and margin, for example high margin flower sellers whose product deteriorates as they sell it. However, there are many non-perishable items with high margins, such as diamonds. Some ostensibly perishable items, such as foie gras or caviar, retain high margins as preservation techniques afford them low perishability. While many 'perishable' suppliers have great bargaining power, as long as they are prepared for the 'nuclear option', i.e. destroying or pulping their left-over product, many time-based high margin businesses have weak bargaining power. Airlines and shipping companies are particularly good examples of businesses that have high perishability (a flight seat foregone or a voyage missed have perished) but low bargaining power. Potential buyers are able to game these suppliers up until the last minute and beyond, i.e. if the buyers miss a purchase in many cases an equal purchase is available reasonably soon thereafter. This is a characteristic of competitive markets noted early, excess capacity.

9.2.2 Industry and type of product

The dynamics of multilateral reciprocal trade – where all participants are ultimately both buyers and sellers – would tend to favour industries that combine highly fungible products with low barriers to entry for two reasons: a highly competitive industry is likely to be actively inclined to pursue new trading channels; and trading highly fungible products (that would be in demand across a range of industries) increases the likelihood of participants being able to find something to buy once they have transacted a sale.

9.2.2.1 Air travel and hospitality

The travel and hospitality industry (including airlines and hotels) is characterised by perishable products; finite selling horizons; and price sensitive and unpredictable demand (relative to supply constraints). Currently the industry as a whole exhibits low profit margins – 2.7% in 2010 and predicted to be 1.5% in 2011 (Pearson, 2010) - given its large fixed costs (although variable costs are small in the short run). While sophisticated capacity and revenue management strategies have been developed since the 1980s (see appendix 13), the underlying models still have to contend with issues of pricing, inventory control, demand forecasting and overbooking, especially regarding last minute surplus inventory. A capacity exchange could offer an attractive channel to trade excess airlines seats depending on the trading model and degree of transparency within the marketplace. In 2010 the occupancy rate for the aviation sector was 78.4% (IATA, n.d.), an improvement from the figure quoted in 2008 of 73.3% (EEA, 2010). The increase indicates that there is potential for further improvements in capacity usage. In discussion, airline industry people indicated that headline capacity is not representative of actual foregone capacity. They pointed out that staff travel, staff family travel, existing reciprocal deals (for example, with charities) or pensioner travel, meant that their headline capacity was often absorbed by existing obligations. In addition, a capacity exchange would have to prove as or more effective than existing last-minute online cash-based platforms such as Expedia and Lastminute to attract participants from these sectors (see appendix 14). A firm will decide whether to use a capacity exchange by comparing the costs, benefits and risks of doing so to the available alternatives.

Logistics, transport and shipping

Logistics, transport and shipping are subject to capacity fluctuations (Zerby and Conlon, 2002). Marketing mechanisms (e.g. pricing) and operational mechanisms (e.g. remote processing, automated technology) are used to manage and stabilise aspects of demand and thereby manage capacity. Large scale probabilistic optimisation heuristics, which consider both marketing and operational price variables and resemble revenue management in airlines, are used in price adjustments (Verma, 2011: 288). Logistics, taken broadly, could be an attractive industry on a capacity exchange based on its 'sector neutrality' - most companies need logistics. Logistics of roughly comparable degrees is needed among different industries, e.g. pharmaceuticals and beverages.

Container transport (shipping and trucking) is often cited as an industry which could further develop capacity management given that numerous goods tend to be delivered one way only, implying an empty return leg. While contract pricing partly compensates for that 'unused capacity', logistics providers would be interested in finding ways to optimise capacity utilisation, provided that these techniques are fully tailored to their specific needs and distinguish between sub-sectors (e.g. bulk shipping, liner shipping). Shipping is an industry actively seeking to reduce trade friction. Bolero.net is an initiative started in 1995 by logistics firms and banks to dematerialise cross border trade processes such as import and export letters of credit, guarantees, documentary collections and supply chain finance. The resulting ICT network forms a platform for e-commerce throughout the shipping and wider logistics community. Yet Bolero.net has not been widely adopted. The complexity of commercial arrangements in shipping has not permitted high levels of automation.

Construction

In Europe, the construction sector has been particularly affected by the recent financial crises and ensuing downturn, following a period of net expansion during 1998 to 2008 (Callow, 2010). The industry has substantial excess capacity. While the construction industry has been looking for additional sales channels, evidence from the Swiss WIR system suggests that sustainable motivation to participate on a capacity exchange would lie in longer-term sourcing of materials and accessing alternative financing. Respondents from WIR indicate that the significant involvement of the construction industry – accounting for over 30% of WIR membership – was historically motivated by cheap credit 10 to 15 years ago when market rates were at 7% to 8% compared to the WIR's 1% at the time. Construction would seem an attractive, but not essential, sector for a capacity exchange.

Energy

Trade in the energy sector is both specialist and expensive. Productive capacity tends to be added at large scale and significant cost – for example, the building of a new energy plant – which requires long-term planning and significant upfront investment. The incentive to build additional infrastructure depends on demand forecasts and the ability, ultimately, to produce at lower marginal cost than competitors. As outlined in box 10.1, capacity management in this sector is highly complex and sophisticated. Online monitoring and trading systems have been

developed.[63] Electricity, for example, is not storable, so peak demand must be satisfied by production from generators that are used as little as 1% of the time. This implies that infrastructure needs to be available even if not fully utilised (SMOR Chamber of Commerce, 2007). Given the complexity of contract and security issues around supply and delivery, energy trading requires sophisticated and tailored solutions in terms of operational capacity management, delivery and data around transactions. Recent developments in energy markets, such as tagging energy supply as renewable or 'green', might lead to new opportunities for product differentiation and long-term contracts, e.g. providing a middle England cooperative with renewable tidal energy from the Channel Islands or Scotland regardless of the exact current price of energy.

Box 10.1 – Energy: industry structure and capacity management

Energy as a product has many characteristics that make it an attractive prospect for capacity exchanges: installation and infrastructure are necessarily large scale and capital intensive, with low marginal costs of production; the product is generally crucial to customers and difficult to store. A degree of spare capacity in the energy industry motivates producers to find more ways to make use of that capacity. At the same time, it seems reasonable to assume there are consumers with flexibility regarding their use of energy. The combination of spare capacity and flexible consumers should encourage capacity exchanges.

The energy industry has long looked to trading markets to address the issue of optimal capacity utilisation. Beginning with crude oil markets in the 1970s, and now encompassing products as diverse as natural gas (especially in North America), electric power (North America, regions in Europe, Australia, etc), refined oil products such as gasoline (petrol), kerosene (jet fuel), diesel, and fuel oil, and most recently LNG (liquefied natural gas), energy markets have played a major role in driving up average capacity utilisation across the industry. Productive assets from oil producing platforms to refineries and blending facilities to storage tanks for end-user products are all relentlessly optimised by the major energy companies, independent traders and the trading arms of commercial and investment banks.

Markets have also evolved specialised transactions around capacity utilisation, and around the price and volume risks inherent in owning and operating power plants, refineries etc. Tolling agreements for power plants, where the owner of a facility sells the right to deliver fuel and take off electric power and so is limited to earning a fee for the processing, are common and similar structures have been used around blending facilities and refineries. Take-or-pay agreements similarly insulate the owner of capacity from price risk and from fluctuations in capacity utilisation. Long-term supply and off-take agreements, increasingly involving national governments, also remove capacity from the potential target market for a capacity exchange.

[63] For example, Interconnector, which operates a sub-sea pipeline connecting the UK and continental Europe that it rents to gas shippers, has developed an online trading system which allows them to manage their capacity by tracking the position of each shipper, providing information updates and matching delivery trades at either end of the pipeline. The information it provides to users includes daily and capacity summaries, historical flows and a bulletin board of offers. See Interconnector Media Release, 22 May 2000, accessed September 20, 2011, http://www.interconnector.com/PDF/PressRelease220500.pdf

The nature of energy installations is such that regular and unplanned maintenance and operational fluctuations occur which mean that there may be a market for very short-term opportunistic trading of capacity in a standardised form which is quick to execute. Such incidents tend to be associated with periods of very high volatility and therefore attract traders, but a capacity exchange may be able to open up this area to more participants by offering standard terms and conditions and clearing services to manage credit risk.

Media/Publishing

The media industry is already significantly involved in existing forms of multilateral reciprocal trade (for example, corporate barter). As virtually every company needs or desires some form of advertising and marketing, demand for this type of service is high. Budgets are, however, not high and depend on revenue stream fluctuations and transient circumstances, e.g. sports opportunities or a competitor's advertising campaign. Given the high degree of perishability, fungibility and margin, media and publishers would be ideal early adopters of a capacity exchange.

9.2.3 Participants: size matters

The question of who would be the early adopters of a capacity exchange is of fundamental significance to its chances of success and its ability to scale. The profile of the early adopters is likely to influence a number of variables including entry requirements such as company size and annual turnover; and the frequency and volume of trades required over a period of time. The capacity exchange design and operation will also depend on the extent to which organisations can be incentivised through the types, conditions and benefits of membership; as well as through the structure of the exchange itself, including its policies on data transparency and the possibility of cashing-out of the system.

9.2.3.1 Listed companies and multinationals

The principal incentives for a capacity exchange to target listed companies and large corporations include the lower, easier-to-evaluate credit risk; increased name recognition for other participants; and, through their large and extensive supply chains, the potential to expand scale and membership of the exchange quickly. One respondent suggested that "*those who will take advantage of new opportunities are those with resources, experience and cash*". Through large multinationals, a capacity exchange could potentially evolve horizontally as a channel for capacity swaps, or vertically as a means of sourcing throughputs and improving supply-chain efficiency.

As one respondent indicated "*No one in any Fortune 500 company that we know of has a unified barter strategy*". Some respondents indicated that a minority of Fortune 500 companies occasionally do barter though not necessarily in their core markets where it could endanger the marketability of their brand or product(s).

Moreover, the participation of large companies is likely to be conditional on the ability of the exchange to offer goods and services specific to their requirements and standards. Transactions would presumably be high value but low frequency initially, presenting a possible obstacle to achieving critical mass in trading volumes. As levels of trading directly affect liquidity, listed companies and multinationals may not trade sufficiently often for a high liquidity capacity exchange. For a

multinational, deciding to join a capacity exchange is likely to be lengthy and complex given the unusual proposition that a capacity exchange offers compared to existing sales channels. In conversation, participants noted possible conflicts between internal departments and the reluctance of company boards to commit to joining before any demonstration of the specific benefits. Capacity exchange operators would have to invest significant resources and time to attract large corporate members.

9.2.3.2 Small and medium sized enterprises (SMEs)

SMEs are attractive participants for a capacity exchange aiming to secure membership and frequency of trade fast, especially as SMEs outnumber large companies in any economy and the key decision-makers are more easily accessible. SMEs are likely to be more inclined than larger companies to finance existing expenses in highly fungible goods and services that meet their needs (such as travel, media, entertainment, printing capacity, etc.) with their own goods and services, rather than using cash or sovereign currency-based credit channels. SMEs tend to present a higher credit risk compared to large companies, although large companies can also present a credit risk and the credit implications in the event of a large corporation going bankrupt can be enormous. Appropriate credit check procedures and monitoring of negative balance positions can reduce the default risk, but have costs.

SMEs are also likely to benefit the most from participation on a capacity exchange whose value proposition is based on "*funding expenses with new sales*" and "*access to credit*", provided that they keep a balance with cash-based trading channels in order to meet their liabilities. SME participation is easier to secure than that of larger firms. Larger firms have direct access to capital markets. SMEs often have restricted access to traditional finance, i.e. primarily through banking relationships, and can be more open to new forms of credit. Furthermore, SMEs do not benefit from the same ease of access and conditions for financing as larger companies (e.g. SMEs cannot typically issue bonds). Most respondents felt that SMEs were likely to have the most to gain from a capacity exchange, though they questioned the extent to which they would have the resources to be the 'early adopters'.

9.2.3.3 Government agents

Counting government agents among either trade participants or exchange endorsers is very appealing to any capacity exchange as it could significantly raise credibility. As with listed companies and multinationals, the participation of government organisations may act as both an incentive for other participants to join the marketplace, and also as a signal to potential market participants that the exchange is viable and secure.

Participation on a capacity exchange could prove beneficial for governments as a procurement channel to support regional economic development or as a tool to stimulate export opportunities for state-owned or state-controlled companies, as well as wider domestic industry, if the capacity exchange was internationally established. To date, government participation in multilateral reciprocal trade beyond countertrade has been fairly insignificant.

There are potential conflicts of interest should a government choose both to participate (acting as a capacity exchange member) and to endorse a capacity exchange (acting in a public capacity as a regulator). Endorsement should be the result of independent assessment about the benefits to all industries, not just those in which government has a stake, for example to provide countertrade opportunities.

9.2.4 Addressable market for a capacity exchange

The basic functions of a market are to match buyers and sellers; facilitate the exchange of information; and provide an institutional infrastructure (Bakos, 1998). When considering the addressable market for a capacity exchange, a closer look is required at what is traded and how.

9.2.4.1 Capacity traded – excess or available

As detailed in chapter 4, capacity is the capability of a firm to provide goods, services and infrastructure. Capacity therefore refers not only to productive capacity but also, for example, to inventory, marginal production or alternative infrastructure use. Excess or spare capacity is normal for many businesses at points in their business cycle but it is difficult to foresee a 'pure' capacity exchange, i.e. one that only trades excess capacity and not 'business as usual' goods and services. The optimal ratio between capacity traded in existing channels and capacity traded on a capacity exchange will be influenced by the size of the company, the market structure of its industry and by the existing cash-based liabilities that company has to meet.

9.2.5 Standardisation and pricing of tradeables

The degree of heterogeneity between goods, services and infrastructure traded on a capacity exchange affects pricing, competition and quality. Heterogeneous goods "differ significantly from each other and are not easily substitutable" (OECD, 2011c) contrary to homogeneous goods for which "buyers perceive no actual or real differences between the products offered by different firms" (OECD, 2011c). Contrary to a perfect competition market – where no participant has the ability to influence pricing and where the goods and services traded are all substitutes for each other – the heterogeneous nature of both the products and participant industries on a capacity exchange could affect pricing, since prices are influenced by both the characteristics of the different products and the bargaining power of buyers and sellers. In order to trade heterogeneous goods and services on a capacity exchange, where participants are likely to vary in terms of size, location and industry, significant investment is needed to standardise contracts in terms of price, quality and specification for a diverse range of products.

With respect to pricing models, existing forms of multilateral reciprocal trade showcase pricing mechanisms ranging from set prices (pricelists) to negotiated prices, including bidding or auction-based price formation. For trades at an international level involving government participation, prices tend to be negotiated rather than set and these types of trades seem to require significant agency broker activity. At the level of smaller, retail barter exchanges, set prices are more common. Pegging the common tender to the sovereign currency where the exchange is located facilitates valuation at cash-world prices. One benefit of this pricing model as put by a respondent is to "*be able to attribute a value to goods and services in order to allow for account keeping*". The pricing mechanism is also importantly a way to determine the relative value of the goods and services

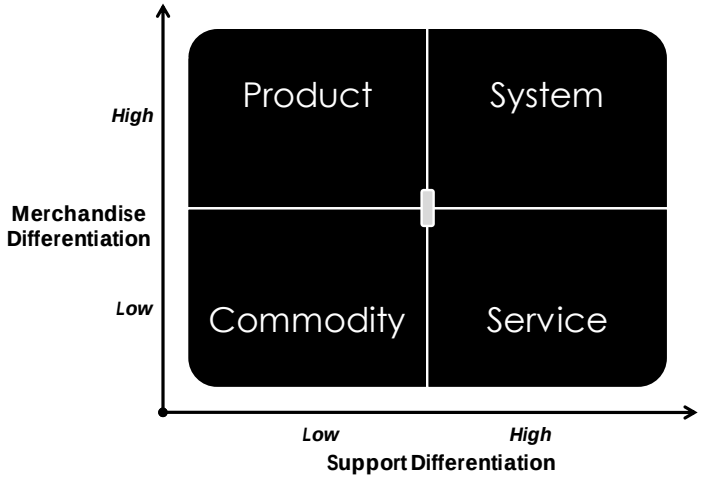
available for sale. It is possible that prices on a capacity exchange may differ from those in the standard market economy, in which case the possibility of arbitrage between the two markets comes to the fore. This is only possible however, if exchanges operate consistent information disclosure policies on pricing. In this respect, a proposal such as Universal Currency may offer an interesting area for further research in order to assess any pricing variations across multiple exchanges trading with the same common tender. Assuming a certain degree of automation, set prices as well as auction and bidding mechanisms are both suitable approaches for a capacity exchange.

9.2.6 Scope and evolution of an exchange – industry-specific or cross industries

The scope of a multilateral capacity exchange refers to its industry focus and has implications in terms of value proposition, marketing to participants and scalability potential.

When examining competitive evolution, it is useful to consider the forces of competition using Professor Shiv Mathur's work (Mathur and Kenyon, 1997). Mathur maps generic competitive strategies by concentrating on the interface between an organisation's offerings and its customers. He sets out a diagram with four competitive strategies – commodity, product, service and system. The four types of strategy are dictated by the amount of 'hard' merchandise and by the amount of 'support' needed. Looking at computers provides an example of the four strategies in action: large scale warehouses sell boxes of personal computers as a commodity; some suppliers try to brand their products so consumers care about the label, e.g. an Apple computer; some local firms providing a new computer network are service-oriented; some of the biggest firms compete in the outsourcing market trying to provide a complete system solution.

Figure 10.3 – Competitive evolution



Source – adapted from Mathur, 1997

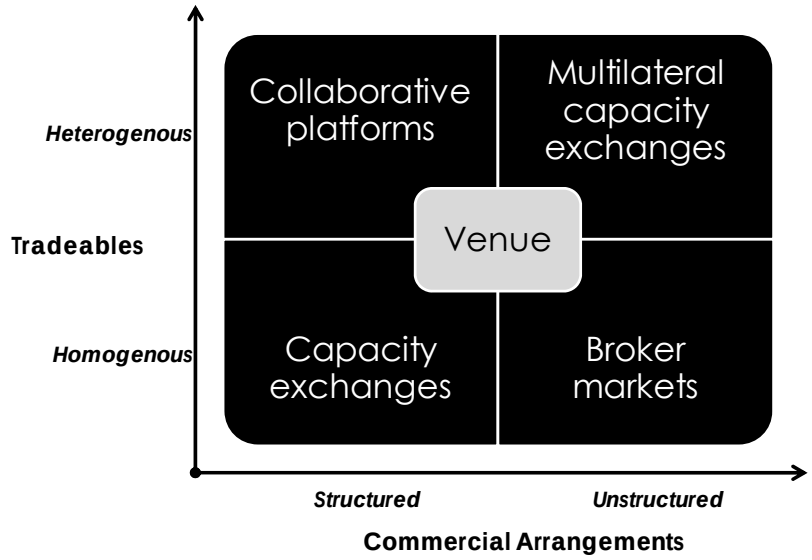
All new offerings start off in the top right box as systems. The first computers, the first automobiles and the first aircraft were all offerings that couldn't just be bought. They needed people who understood precisely how they had been made; people who could repair them at short notice; people who would work with the new owners

on improvements. As competition intensifies, standards emerge, mass production becomes the norm and people are clearer about what they want. Customers want to buy services and products as cheaply as possible. The flow in this diagram is from top-right System box where new complex products emerge to bottom-left in the Commodity box. How do you know you're in the Commodity box? "You're selling a commodity when buyers don't care who you are".

Advertising is a strong sign that people are trying to swim against the tide flowing down towards commoditisation, by emphasising the choices people face, whether real or illusionary. At the same time, people get bored with making obvious decisions. "I just want … a car that gets me from A to B; a piece of software that does what it says; a simple cup of coffee". The evolution of choice is part of the evolution of industries. Advertising in a competitive, innovative market is healthy and shouldn't get out of control because competition will ensure that ineffective advertisers, or those who advertise too much at the expense of profit, will go bust. This surfeit of advertised choice is not a sign of failure, rather a sign of uncertainty about the future choices people may want to make and an effort by firms in competition to evolve to new sets of choices.

The effective way to compete in Mathur's map is to swim against the tide flowing from System to Commodity. Some industries are stuck in the Commodity box with little profit to innovate. To move from the Commodity box, firms have to make people care about who they're buying from. The profits they make, decreasing as firms sink to the bottom left, need to be used to evolve new merchandise and new support. Profit gives firms the ability to evolve. Innovation is needed to swim against the tide successfully. Today, new technology is helping firms to swim against the tide by undermining the efficiency of commoditisation. Industries are successfully moving away from mass-produced commodities and toward personally customised services. Evolution has happened in automobiles. First you could order a model, then a profusion of permutations and now you can, in effect, purchase a long-term transportation provision contract. Hardware and software companies now allow you to specify a customised computer online and have it delivered in days. Airlines let us do things personally that formerly had to be done through agents. Drug companies hope to be able to move from general prescriptions to highly effective, personalised drug combinations specific to just one person's DNA.

Figure 10.4 – Classifying multilateral capacity exchanges



Some capacity exchanges try to differentiate themselves in order to move from commodity trading to being an integrated system with their clients. Efficient existing exchanges trade close-to-commodity tradeables, e.g. equity shares, bonds, commodity lots. Capacity exchanges can work close to homogenous tradeable goods and services. Multilateral capacity exchanges are seeking to help corporates trade heterogeneous goods and services internationally in less structured environments for commercial arrangements. The market is wide and open, but the heterogeneity of tradeables and unstructured arrangements makes it tough to achieve economies of scope or scale or liquidity.

A number of industries are increasingly focusing on effective supply-chain management, especially in light of increased fragmentation of production processes, growing competitiveness in international trade and rising quality standards worldwide. This focus on supply-chain management fostered private e-marketplaces during the dot.com boom where dominant players in industries like chemicals set up vertical trading platforms to source better quality and more competitive inputs. Industry-specific capacity exchanges can be attractive propositions. For this type of capacity exchange to take off, it would have to bring on board the industry's dominant players, especially in 'conservative' industries such as energy and shipping where dominant players have been in the market for a significant time and retain some control over its functioning. In some 'conservative' industries, a capacity exchange is nothing new - consider the Baltic Exchange where shipbrokers, shipowners and charterers arrange for the ocean transportation of industrial bulk commodities from producer to end user. As one respondent said "*if the capacity exchange is industry-specific, key players (anchor tenants) will need to be on board through an equity stake to ensure some level of minimum commitment*". An industry-specific capacity exchange will have to tailor its offering in terms of brokerage, trading and clearing services to meet an industry's specific requirements. Over time, and depending on the levels of participation and the corresponding size of the market, one potential outcome of an industry-specific capacity exchange is that other firms within that industry could be compelled to join in order to stay competitive.

At the other end of the spectrum, a multilateral cross-industry capacity exchange (MegaCapEx – see box 10.2) might be an attractive proposition when it features a wide range of fungible goods and services needed by most businesses, and offers additional sales channels. While attractive in principle, respondents wondered how such a capacity exchange differed from the 'wider market' of goods and services accessible via the internet. Most doubted that such an exchange would be able to offer wanted goods and services for participants of each industry in the quantity and time-scales that they were required[64], especially when targeting large companies at an international level. Respondents from the existing barter industry suggested that brokerage is particularly important as, while an exchange may not have the first product choice of every single participant, it is likely to be able to match preferences between the second and sixth item on a list of desired products. A broker who 'hustles' can often create deals and the capacity exchange is a mechanism that helps reveal a starting list of preferences. This implies that a capacity exchange offering heterogeneous products may have an advantage over a single-product exchange.

Respondents questioned the ambition of a cross-industry capacity exchange, suggesting that diverse industries behave differently and have different requirements and that it will be difficult to get acceptance for a 'generalised' capacity exchange. Several financial exchange experts remarked that a cross-industry capacity exchange would be "*attempting to operate on a multitude of dimensions; a more sound approach to building the exchange would be to start with a couple of dimensions, create liquidity and then scale up*".

A middle-way or intermediary step towards a global cross-industry capacity exchange would be to set up a cluster or hub of industry-specific exchanges (HubEx – see box 10.2). Most clusters, whether in finance, technology or trade, rely on three fundamental inputs: industry-centred complexes, agglomeration and social networks or clubs (Cooper, 2011: 47). For instance, a mechanism which allows for trading within one industry might be established as one node of a wider network which could connect with other industry-specific capacity exchanges.

Box 10.2 – One large capacity exchange versus a hub of capacity exchanges

When considering the characteristics and relative desirability of a single major capacity exchange (MegaCapEx) versus a hub of capacity exchanges (HubEx) the following aspects deserve particular attention: the challenge in building a community and therefore traction in the marketplace; the operational issues relating to each proposition; and the likely attractiveness of each model to both owners and market users.

[64] Regardless of whether the common tender is perceived to be a store of value or not, if a company needs a certain quantity of goods by a certain time they will want to source them from a market where they are guaranteed to be able to do so.

	MEGACAPEX MODEL	HUBEX MODEL
Community	Developing a broad community for a genuinely heterogeneous set of tradeables is likely to be lengthy and prove challenging.	Potentially faster development of homogeneous markets and smaller, deeper pools.
Operational issues	By attempting to deal with a heterogeneous set of tradeables MegaCapEx is more likely to create a platform that can be genuinely reciprocal.	Problems in extending across multiple tradeable categories will be compounded by multiple rule books and technical platforms trading within a hub.
Key attractiveness to users	Wide-ranging scope and scale, but less compelling need to participate – though the scale of credit provision, if sustainable, could be a focal need.	Specialisation and professionalism.
Attractiveness to owners	If community is not created for a broad set of tradeables, ultimately the mega-capacity exchange concept is invalid.	When specialisation no longer guarantees profits and scale becomes attractive – either further integrate with other members of Hubex and acquire new specialists, or transform to MegaCapEx model.

Likely success (over time) of the MegaCapEx Model

As noted elsewhere, 'capacity exchange' is a complex concept to sell. The larger and more heterogeneous its scope and its geography, the more difficult it will be to gain momentum. It is conceivable, however, that, if successful, the MegaCapEx model could deliver significant returns. Conversely the more homogeneous and limited the scope the easier it should be to get going faster. A network of capacity exchanges around a "hub" may be easier to sell.

The prospect of getting value from "dead capital" or "unsellable product" in fungible goods is highly alluring to businesses. Greater operational efficiency for HubEx members derives from a narrow scope. The paradox is that increasing size and scale of a successful HubEx network induces it to move towards the MegaCapEx model. It may be that it is via the HubEx model that the MegaCapEx Model is achieved fastest, if the capacity exchange concept gains momentum.

9.2.7 Geographic reach and scalability of a capacity exchange

If primary participants are large corporations and multinationals, they are likely to trade at an international scale either to source production inputs or infrastructure and to sell their products meaning that the exchange on which they would participate would need to operate at the global level immediately. They are likely to expect to be able to trade at an international level on any type of trading platform. This suggests that if capacity exchanges want to attract listed and other large companies as participants they will need to be able to satisfy trading requirements internationally as well as to propose goods and services coming from

different countries and satisfying specific requirements on the exchange. On the contrary, SMEs are assumed, by and large, to have more localised or national interests, as they engage less frequently in international trade.[65] This is illustrated by the number of existing retail exchanges which are primarily country- based and tend to target SMEs in a local radius.

A capacity exchange could, in principle, scale up to the international level in different ways. First it could join a network of distinct exchanges using the same common tender (e.g. Universal Currency), through which it could trade with other exchanges and allow its members to trade within/with other exchanges. Second, a local capacity exchange could be assimilated in a network or franchise (e.g. Ormita) and act as the local partner representing the network. Third, the capacity exchange could operate at the international level based on either a network of industry-specific exchanges (HubEx model – see box 10.2) or a centralised structure which retains control and decision-making and eventually relies on fully-owned subsidiaries or branches (MegaCapEx model – see box 10.2).

9.2.8 Trading model and technological infrastructure

A capacity exchange can facilitate multilateral reciprocal trade between participants in various ways: acting as an intermediary agent to direct trade, resorting to a fully-automated platform or combining these two options.

As an intermediary agent to direct trade, the capacity exchange is likely to require brokers to mediate trade between participants. Relying on brokerage to conclude such trades is likely to be time-consuming and resource-intensive. Moreover, participants are likely to want access to real time information regarding their trades and their balance positions. A market-making model, where someone injects capital to support buying and selling for particular products or services, is an alternative model. Market-making is a tried approach in financial markets (see box 10.3). However, the exchange must have a strong market position to attract market makers.

Although the need for brokerage and market-making could be reduced through automation, the extent to which a capacity exchange could rely purely on automation is questionable. Most respondents did not believe that a capacity exchange could ever become fully automated, though they recognise that the degree of brokerage may vary over time. Indeed, a capacity exchange that is functioning at scale, has achieved critical mass and represents a liquid marketplace is likely to function on a high tech/low people ratio. To establish such a capacity exchange, however, is likely to require the reverse ratio – greater human resource costs than technology costs, where the focus would be on educating businesses about the benefits of the capacity exchange value proposition, marketing and business development.

Box 10.3 – Market making

Leon Walras (Walras, 1874) conceptualised a process called "tâtonnement" to describe how markets reach equilibrium. Tâtonnement (French for 'trial and error') involved an auctioneer gathering market participants together, where he would announce a start price and participants would declare their interest at that price.

[65] For example, in 2006, UK SMEs' share of exports was around 30%, see OECD, 2009.

The resulting total supply and demand would be added up and the process would be repeated with different prices until the price cleared the market. Some markets do work in that way at least partially – the London gold fix is an example – and most stock exchanges now have an opening auction process to start the day.

But tâtonnement is not a feasible way of running many markets, mainly because participants want to trade at different times of the day. There are also potential problems with gaming and information leakage especially if the order sizes of different participants vary considerably. Most trading in organised markets (such as stock exchanges) and unorganised markets (such as housing) is on a continuous basis – meaning trades can take place at any time.

In very active markets where there is a standardised asset – such as the markets for major currencies – there is always likely to be many orders in the market so a normal order is likely to find a counterpart quickly (often assisted by an electronic display of orders). Furthermore, competition in the crowd is likely to result in a price which is 'fair' or 'right'. In less active markets with no continuous crowd there may be market makers to bridge the time gap or to handle unusually large orders. They will add to their inventory or reduce their inventory to allow other participants to execute their orders.

A market maker incurs costs in performing this role, most importantly the cost of bearing the risk that the value of his inventory will move against him. Market makers typically charge a spread – at any time the price at which they will buy is less than the price at which they will sell so sellers face a discount and buyers pay a premium. For less actively traded assets the risk to the market maker is larger and so the spread will be correspondingly larger. In some assets the economic spread for the market maker will be unacceptably large for the participants. Therefore, some types of less-liquid assets will be traded in markets with market makers (used cars for example) and other will not (used houses for example).

Markets where the spread would be too wide tend to become brokered markets. Brokers will seek out counter-orders on behalf of their clients and negotiate a fair price. The market for houses has been mentioned and the markets for many less liquid stocks are of this type. Often these markets will have some mechanism for displaying orders but, unlike the crowd market, the orders displayed will form a basis for negotiation rather than a firm commitment.

Capacity exchanges are the same as other markets in this respect - if there is abundant, two-way activity in homogeneous goods then a continuous crowd will successfully match orders. If there is less activity then market makers will have a role. But if the goods traded are too variable and orders are too infrequent then a brokered market is the most likely outcome.

9.2.9 Operational management

The commercial viability and integrity of a capacity exchange depends on its operational design, the way the exchange is managed in relation to its ownership structure, the revenue model, clearing and settlement mechanisms and on the level of transparency in the marketplace.

9.2.9.1 Generating revenue

As in other markets, there are a number of ways in which a capacity exchange might generate revenue. Existing trade exchanges tend to charge transaction fees of between 10% and 20%, usually divided across parties to a transaction; joining fees of between US$500 to US$1,500[66]; and maintenance or membership fees. Revenue generation is critical to the viability of the exchange especially to cover technology and development costs. Not all revenue generation needs to be trade-based. Other community-based revenue streams might include corporate registration and directory entries, premium information access, higher ranking search results, bulletin boards for business exchange, write-place-adjust services, advertising, telephony, diary appointments and third party service promotion.

9.2.9.2 Ownership

Ownership of the exchange could be one way to incentivise potential members to participate. During the dot.com bubble, a number of public e-marketplaces (agent directed models) vanished, while private e-marketplaces set up by dominant industry players remained. This suggests that offering an equity stake to key players may be a way to consolidate their commitment to the commercial viability of the capacity exchange and could provide a governance structure that would influence the success of the exchange. The ownership structure is likely to be influenced by other variables including the backing mechanism of the common tender and the potential endorsement by large players and government agencies. Backing is particularly important for industry-specific exchanges where commitment from the industry's dominant players is critical to the success and traction of the exchange.

9.2.9.3 Clearing and settlement – options and risks

Clearing and settlement on a capacity exchange could be taken on either by a central counterparty or clearing house; or be the responsibility of trading counterparties alone (in which case the exchange ostensibly takes no responsibility). E-marketplaces such as eBay, as well as many existing retail and corporate barter exchanges, leave trading risk to the counterparties themselves, *caveat emptor*. That said, it is in the interest of the exchange to increase trust through providing information, e.g. counterparties can be rated on a scale of reliability, quality or price.

In financial markets, centralised clearing and settlement improve credit quality, reduce settlement risks and increase process efficiency. Clearing and settlement issues attracted significant interest from financial exchange respondents. On the one hand, it was argued that a central counterparty would improve operational efficiency and enhance credit, while a capacity exchange operating without a central counterparty would be perceived as more risky and require specialist contracts. The capacity exchange would need to meet certain conditions in order to set up a central counterparty: the volume of trade would have to be significant for the cost of the service to be worth it and the marketplace would need to be sufficiently liquid. Another consideration for a capacity exchange that decided to run a central counterparty is the need to manage its exposure to risk very tightly. This has proven difficult in liquid financial markets and may prove more so in capacity markets that could be much more illiquid and heterogenous.

[66] This information was provided by the trade exchange operators and owners consulted as part of this research project.

On the other hand, some respondents argued that a capacity exchange would not require a central counterparty: as with most forms of cash-based trade, the counterparty risk lies with participants and could do so on a capacity exchange as well. Running a simple registry to record all the transactions, and giving the registry some legal force, could be sufficient to ensure contractual fulfilment by counterparties. Some respondents went further and pointed out that the heterogeneity of goods and services in the capacity exchange proposition precluded an efficient central counterparty.

9.2.9.4 Information transmission and transparency

Transparency, together with brokerage and visibility, are critical to the fulfilment of any transaction. For a capacity exchange, transparency relates to both operations - the rules of the capacity exchange need to be fully transparent to be enforceable; and transactions - participants need to be confident that each transaction has been recorded.

The degree to which information around transactions should be disclosed is another subject of debate. Transaction information needs safeguarding against free-rider risks (a company joins the exchange but only to get information, not to make bids or conduct transactions). A 2002 study on information transparency in electronic marketplaces found that "information disclosure rules crucially affect firms' incentives to join a B2B exchange. For example, non-restricted data disclosure (such as wide-open public B2B exchange) reduces incentives for firms to join the online exchange. Restricted data disclosure (such as private exchanges) restores those incentives. Equally, information transparency benefits some firms but hurts others; market-share will be *redistributed* from high-cost firms to low-cost firms" (Zhu, 2002: 96). Low-cost suppliers prefer transparency, whereas high-cost participants want a more opaque structure, given their unwillingness to expose costs.

Other possible issues around transparency on a capacity exchange include participants selling goods and services of disputable quality or at an inflated or discounted price, in order to take advantage of a closed membership structure.

9.3 Capacity exchange(s) and multilateral reciprocal trade – current and future prospects

In a world where most trade is done in cash and uses traditional financing channels, it seems that multilateral reciprocal trade is likely to complement other conventional trade avenues rather than replace them. One respondent stated: "*barter trade does not cannibalise existing trading mechanisms, it is complementary to existing trading mechanisms*". On retail barter more specifically, another respondent said: "*trade exchange is by definition a limited marketplace – limited by the scope and breadth of the businesses on the exchange. Successful exchanges are those that manage those limits well*".

Despite some ups and downs, the trend has been for trade to increase. To some extent, reciprocal trade is a paradox. Participants gain extra credit based on being part of a 'club' where members will favour each other over outsiders; but this leads to isolation from wider suppliers and customers who could provide challenges to price and quality. Many industries already have sophisticated capacity management and trading mechanisms with respect to available, and sometimes

excess, capacity. As an energy sector expert confirmed: "*core commodity industries have efficient mechanisms to trade capacity; a capacity exchange would therefore be playing on the fringes*". As companies face significant liabilities in sovereign currencies, most notably corporate tax, wages and labour contributions, it seems unlikely that they would be able to generate the majority of their turnover in common tender without a cash-out option. In fact many trading platform operators (including WIR, IRTA and Ormita) advise their members on how to balance their capacity exchange sales in common tender with other regular trading channels, so as to manage their cash flow in order to meet their liabilities.

A further prospect for the multilateral reciprocal trade industry might be the development of 'hybrid banks'. In discussions with UK bankers, awareness of trade credit and alternative currencies was low. However, some bankers believed that their existing infrastructure for trust and payment could work equally well with common tenders as with sovereign currency. A common tender would simply be another currency in their multi-currency systems. They did realise that there would be more complexity, but the idea of basing local economic communities around banks was, they claimed, attractive in principle. The term 'hybrid banks' has been used by financial commentators, such as Chris Skinner, to classify banks that manage "virtual and real monetary exchanges" (Skinner, 2011). A banking approach is at the centre of the WIR system, and a mutual approach is at the centre of LETS systems, so a transition to hybrid banking is theoretically interesting.

9.3.1 Capacity exchange evolution – possible options

In light of both the diversity and breadth of existing forms of reciprocal trade, and the complex relationship between the multiple dimensions of a capacity exchange, there is no 'optimal model' for a capacity exchange. Three options for the evolution of capacity exchanges, and the multilateral reciprocal trade sector, can nevertheless be distinguished.

First, a few capacity exchange start-ups could emerge competing to attract participation and to develop the playing field for multilateral reciprocal trade at a country or regional level. This reflects to some extent the existing state of multilateral reciprocal trade in countries like the UK.

Second, and more gradually, a leading national capacity exchange – such as the WIR multilateral trade network in Switzerland – could emerge, with sizeable membership, especially of SMEs. Trading at a national scale would contribute to the national economy and strengthen local socio-economic development.

Third, one to several multilateral capacity exchanges could concentrate in a country or a megacity – possibly the UK, possibly London, but would trade internationally. Such capacity exchanges would operate at an international level, eventually achieving more significant trades and attracting a more diverse membership which could potentially include large and listed companies, their related supply-chains, SMEs participating in international trade and government agencies. In this scenario, capacity exchanges could be industry-focused, thereby providing tailored services; trade across industries; or do both.

While some evidence supports the first two scenarios, the third scenario is largely supposition. A few capacity exchanges are evolving at the international level;

others are attempting to establish a multilateral capacity exchange operating at the international level and targeting large multinationals in multiple industries where margin differentials could be best exploited through multilateral reciprocal trade.

10 Possible Benefits and Costs

This chapter outlines the benefits put forward by proponents of multilateral reciprocal trade and considers the extent to which these are being, or could be, realised through different types of capacity exchanges. Direct potential benefits include reduced currency volatility, inflation protection and increased trade and employment. An attempt is made to quantify these benefits according to three different capacity exchange models. The possible costs and constraints to participation are then explored, as is the potential for multilateral reciprocal trade to foster wider sustainability by reducing wastage, improving in-kind donation efficiency in the charitable sector, reducing fraud and reducing volatility.

A range of socio-economic benefits from multilateral reciprocal trade are proposed by proponents of the sector, including that it:

- improves cash flow and preserves working capital;
- helps businesses expand or maintain market share;
- increases sales and addresses liquidity problems;
- offers a source of interest free credit;
- helps beat inflation;
- reduces storage and waste by moving excess inventory;
- provides new sales channels.[67]

The extent to which these economic benefits can be achieved is contingent on the design, operation and integrity of the exchange. It is more difficult to assess and quantify possible social and wider sustainability benefits within existing B2B multilateral reciprocal trade. Nevertheless, potential social benefits cited include the ability to:

- foster the participation in the wider global economy of emerging countries which may face restricted trade opportunities due to exchange rate or other currency risks;
- support local or country-wide economic development if the exchange is established at a local or national scale;
- contain job losses in times of economic recession;
- reduce fraud through transparency;
- provide an efficient source of donation capital for development or disaster relief agencies (Recipco, n.d.b).

In order to assess the potential economic and social costs and benefits of establishing a capacity exchange, or hub of capacity exchanges, in the UK interviewees were asked to comment on a range of possible benefits from, and constraints to, participation depending on the possible forms the exchange might take (see appendices 4 and 5). Views varied quite widely between respondents from various sectors, but those who are currently involved in the existing multilateral reciprocal trade industry were generally the most positive about the potential for capacity exchanges to offer economic and social benefits. Industry and financial

[67] See for example "Ormita's Hidden Benefits" - http://www.ormita.co.uk/hidden-benefits.html; Bartercard - http://www.bartercard.co.uk/benefits; Active International - http://www.activeinternational.com.au/

services respondents were more cautious, although almost all respondents agreed that there was some level of benefit to be gained by finding new ways to trade.

10.1 Potential direct benefits

The direct benefits of multilateral reciprocal trade are considered to be primarily economic. Most respondents agreed that, in the case of SMEs, a capacity exchange would be likely to increase liquidity by allowing businesses to conserve cash while still being able to trade using available or excess productive capacity or inventory. Liquidity levels would depend on the volume and velocity of trading and it was generally agreed that SMEs would trade more often, if in smaller volumes, than listed or multinational organisations.

It was assumed that a capacity exchange would help businesses to address short-term capacity fluctuations, since it would provide a market where an unpredicted excess of capacity might be readily traded for other goods and services required, while conserving cash. Similarly, most respondents agreed that a capacity exchange could offer increased market penetration and additional distributions channels, but that these would be marginal benefits and would only ever be complementary to existing trading routes and markets.

Respondents were divided about the extent to which a capacity exchange would improve the competitiveness of participating organisations. Should a capacity exchange reach a critical mass, then it may be the case that certain types of early adopters on the exchange could attain an initial competitive advantage if they were able to access additional distribution channels. This would most likely apply to participants operating in industries with a high number of competitors and substitute products. Respondents agreed that if excess capacity was being absorbed at market prices, participants would have less need to discount any remaining unsold capacity, which would allow them to remain competitive, without necessarily making them more so.

It was generally agreed that capacity exchanges could potentially play a role where there is no established market for a particular good or service or where the market is saturated and there is a surplus of capacity. If capacity exchanges could create a market or a supplementary market in such instances this should have beneficial effects on the market as a whole.

In the discussion of direct economic benefits, the most significant disparity in views arose on the question of whether multilateral reciprocal trade with common tender would be a means of reducing currency volatility and/or 'beating' inflation. The following discussion presents an initial, and necessarily simplistic due to data constraints, analysis of how capacity exchanges might possibly impact on macroeconomic variables, although it is understood that in order to do so, such an exchange would need to play more than a complementary role in an economy.

10.1.1 Currency volatility

Sovereign countries have the right to follow their own monetary policy. In the wake of market liberalisation, and the expansion of international trade and investment in foreign markets, the monetary policy that each country chooses to pursue is likely to affect its trading partners. Since 1945 the world has been on the 'dollar standard' with the US$ as the world's reserve currency. USA monetary policy decisions

therefore have a more significant impact on the wider global economy than those of any other sovereign state. Although the dollar standard appears robust (McKinnon, 2011), financial crises since 2008 have raised significant concerns about the extent to which the current monetary economy is a contributor to the economic, and associated social, tensions and problems that the world is witnessing today. Changes in monetary regimes tend to be swift, e.g. the world leaving the British pound or the gold standard, followed by long periods of stability.

The connection between exchange rate or currency volatility and economic crises at a macroeconomic level is related to balance sheets of financial and business organisations and private individuals: "with sound balance sheets of banks, firms and households, exchange rate or financial shocks do not translate into a deep, financially caused recessions (sic). Weak balance sheets are vulnerable to loss and can be translated into large output losses" (Semmler, 2000: 151). The effect of exchange rate shocks on companies is two-fold: "when an exchange rate shock occurs, the debt denominated in foreign currency rises, the debt service obligation of firms, households and banks rise and – due to loss of collaterals – they receive less credit" (Semmler, 2000: 151).

Should a capacity exchange allow companies with foreign currency-denominated debt to reduce their borrowing (credit) needs – by enabling them to source goods and services for other goods and services, and therefore conserve cash reserves – they will be less likely to need to access foreign debt markets, and would therefore be able to withstand exchange rate shocks to a greater extent. Respondents agreed that, for companies involved in cross-border trading, common tender issued by a capacity exchange could contribute to the reduction of exchange rate risk, since the transaction would not involve conversion to or from another sovereign currency. Should a capacity exchange strengthen balance sheets by providing an opportunity to pledge future capacity against common tender and thus increase diversity of funding, then theoretically there is some potential for a capacity exchange to contribute to reducing the effects of currency exchange. In turn, should exchange rate volatility lead to a wider economic crisis, the balance sheet of the organisation would also be more robust and therefore, potentially, more likely to see that business through the crisis period.

Nevertheless, it is likely, in the event of exchange rate shocks, that the relative prices of foreign and domestic goods will not remain consistent, since one or other producer of those goods will be at a disadvantage which is probably not sustainable and certainly not profitable. If prices on a capacity exchange are, therefore, altered in response to such a shock, the argument that trading in common tender on a capacity exchange would provide protection against exchange rate shocks is less convincing.

10.1.2 Inflation

Inflation is generally controlled through money supply and the setting of interest rates by central banks. Since inflation negatively affects the purchasing power of a particular currency it is ideally kept low and stable; the inflation target for the UK for example is 2.0% on average (Bank of England, n.d.). Businesses that trade using sovereign currencies are affected by the inflationary and deflationary pressures on that currency. Relative currency pressures affect imports and exports and, in turn, trade flows.

Existing retail and corporate barter exchanges maintain parity between the common tender issued by the exchange and the sovereign currency of the country in which it is established. This suggests that the common tender would be subject to the same inflationary and volatility pressures experienced by sovereign currencies in the mainstream monetary economy. Some respondents, however, argued that a capacity exchange could allow participating organisations to avoid inflationary pressures if the common tender were decoupled from the sovereign currency, as it would then operate independently of the amount of money circulating in the mainstream sovereign currency economy (Ormita, n.d.). Equally, it is suggested that, although pegged to a sovereign currency in order to enable pricing of goods and services, the actual purchasing power of the common tender (trade dollar, trade pound etc.) is derived by the nature of the market within the exchange – including the frequency of trading and the associated liquidity of the currency – and does not necessarily reflect the purchasing power of its sovereign equivalent.

Most respondents, however, suggested that until the common tender achieved sufficient liquidity, inflation was actually a highly likely result of multilateral reciprocal trade. This concern has been borne out to some extent in existing retail barter exchanges. For example, one customer on retail barter exchange discovered that a plasma TV screen retailing at £3,000 to £4,000 would cost him the equivalent of £17,000 on the exchange (Ellson, 2004).

The only existing common tender for which stabilising properties on the economy have been studied is the WIR franc. Using 56 years of WIR data on participants, WIR francs in circulation, turnover and credit, Stodder (2009) has demonstrated the counter-cyclical nature of the WIR franc, showing that WIR are most likely to be accepted when ordinary money is in short supply and suggesting that the purchasing power created through WIR could become an instrument of effective macroeconomic stabilisation. This counter-cyclical effect is supported by recent anecdotal evidence (see RAI TV, 2010) which explores the relevance of the WIR exchange in the recent crises and highlights how participants' turnover in WIR francs in a variety of sectors has remained stable or increased relative to their turnover in Swiss francs (which decreased as a result of the financial crisis). It should be noted however that the WIR is a unique platform – it has been in existence for over 75 years, in a single country, Switzerland; its operator, WIR Bank, has been subject to banking regulation since 1936; and its common tender is used in combination with Swiss francs (see box 8.1).

10.1.3 Money, trade and employment

Proponents of capacity exchanges and innovative forms of multilateral reciprocal trade assert that they could play a role in the prevention of job losses during periods of economic crisis. In classical economic theory it is argued that unemployment is the result of market imperfection, resulting from the high cost of labour which in turn causes a supply of labour that is in excess of demand. Market forces of supply and demand should redress this problem as labour costs would be reduced to the point where there is demand for labour at that price and market equilibrium is re-established. Taking such an approach, a capacity exchange should have no particular impact on employment levels. Two further relationships link money, trade and employment: employment levels and the rates of growth of nominal national income and the quantity of money; and employment levels and levels of trade.

A number of experts have commented on the potential for Basel III regulations, which require the capital/asset ratio of banks to rise, to impede growth since "the growth of assets – and hence the growth of balance sheet totals and deposits – is likely to be held back" (Congdon, 2011). One corresponding effect could be a period "of nil or low growth of the quantity of money, and hence of nil or low growth of nominal national income" (Congdon, 2011). It has been suggested that the inadequate growth of money is the "most compelling explanation for the persistence of high unemployment" (Congdon, 2011). While it does not rely on sovereign currency, the extent to which a capacity exchange could counteract this trend would depend on its ability to achieve critical mass and maintain liquidity at scale through the use of common tender. The potential for common tender to counteract sovereign currency shortage through its own credit issuance is difficult to analyse given the lack of accurate data relating to existing forms of multilateral reciprocal trade.

The suggestion that a capacity exchange could prevent job losses during periods of recession is linked to claims that it could improve, or maintain, levels of B2B trade. Trade theory "often relies on the assumption of long-run full-employment implying that, while trade can affect wage rates and the sectoral distribution of employment it has no effect on the overall level of employment" (OECD *et al*, 2010: 9). Although trade economists do not consider trade to be a determining factor in the causes of unemployment there is "a small but growing literature on the relationship between trade and unemployment" (Dutt *et al*, 2009: 33). The researchers who highlight this link also note a need "not only for theoretical work but also rigorous empirical work investigating the effects of trade on unemployment" (Dutt *et al*, 2009: 33). At scale, it could be possible for a capacity exchange that generates significant additional trade to lower the non-accelerating inflation rate of unemployment, i.e. more jobs and greater price stability, for wider benefit. Should a stronger relationship between trade and unemployment be established it would be of use in assessing the potential contributions that a capacity exchange could make on this particular issue.

At a more simplistic level, should a capacity exchange allow a company to maintain a level of commercial efficiency which it is not able to do in the mainstream economy, and which prevents it from going bust, then clearly this would have positive implications for employment. Most respondents suggested that if a company is not able to maintain its competitiveness without recourse to multilateral reciprocal trade than perhaps that company is ultimately likely to fail because of more competitive players. A capacity exchange would not necessarily be sufficient to prevent this.

10.2 Quantifying the potential benefits of capacity exchanges

The diversity in scope and breadth of existing forms of multilateral reciprocal trade, and the lack of systematic and comparable data on volume, value, and credit extended through such trade, make attempts to quantify direct economic and wider socio-economic benefits a difficult task. Moreover, the degree to which capacity exchange could benefit society in terms of job creation, increased credit supply and economic growth is likely to depend on the particular design and operation of the exchange as well as its integrity and the trust participants place on its continuity.

Table 11.1 outlines possible benefits to the UK – including the potential for job creation and increased sales for participants - that might accrue from three possible capacity exchange options (outlined in chapter 10): Small - several UK exchange start-ups; National – a UK capacity exchange (SME-oriented) similar to the WIR and proportional to the UK economy; Multinational - a few multilateral capacity exchanges (based in the UK with benefits diffused globally). It is important not to overstate the benefits that a capacity exchange could bring, particularly given the lack of consistent data available for any existing multilateral reciprocal trading system apart from the Swiss WIR which, having been operational for over 70 years, represents just 0.3% of Swiss GDP. Nevertheless, the numbers presented here attempt to give some estimate of the ranges which might be achievable.

The direct jobs created by the exchanges would be small. The benefits for trade participants include increased credit, wider markets (where the benefits are based on membership across networks) and capacity utilisation (where the benefits are based on less wastage going through to higher margins). Wider job creation among the trade participants is estimated in line with increased turnover of the firms. Currency hedging costs are assumed to decrease when using a common tender internationally that is based on a basket approach, e.g. SDRs, WOCU® or UTU™. In-kind donation effectiveness is a proposed benefit that proved difficult to quantify, as was reduced wastage and storage. Finally, a less volatile, more counter-cyclical economy is tough to value, but some indicative calculations are presented based on a mid-range implied GDP volatility reduction valued using a standard option pricing model.

Table 11.1 – Benefits estimates summary

	Option 1 Small - several UK exchange start-ups	Option 2 National - UK capacity exchange (SME-oriented)	Option 3 Multinational - a few multilateral capacity exchanges (based in the UK, but benefits diffused globally)
Direct benefits			
Job creation through the exchange	25 to 100	70 to 300	200 to 500
Increased credit	£20 million to £164 million to £250 million	£15 billion to £65 billion to £80 billion	£25 billion to £132 billion to £160 billion
Wider markets - increased sales (more competitive & innovative)	£2 million to £16 million to £25 million	£5 billion to £13 billion to £20 billion	£10 billion to £40 billion to £60 billion
Capacity utilisation - higher margins (more	£250 million to £1.4 billion to £3 billion	£8 billion to £14 billion to £20 billion	£50 billion to £110 billion to £200 billion

	Option 1 Small - several UK exchange start-ups	Option 2 National - UK capacity exchange (SME-oriented)	Option 3 Multinational - a few multilateral capacity exchanges (based in the UK, but benefits diffused globally)
competitive & innovative)			
Job creation for participants	100 to 140 to 200	50,000 to 110,000 to 150,000	200,000 to 525,000 to 650,000
Reduced currency hedging costs	nil	nil	£5 million to £18 million to £30 million
Wider benefits			
Improving in-kind donation effectiveness	unlikely	likely, medium & national	likely, low & international
Less volatile, more counter-cyclical economy	nil	£50 million to £300 million to £1 billion	£100 million to £860 million to £2 billion
Sustainability benefits			
Reduced wastage	small	high	high
Reduced storage	nil	small	small

Option 1: several UK exchange start-ups are established in the UK. Several hundred SMEs trade on these exchanges at some frequency. Bottom, likely and top range calculations are based on sample accounts of similar exchange operations[68] and on the turnover, employment and other economic data of UK SMEs (BIS, February 2010). This option has a large ratio of benefits to investment, although relatively few jobs or directly measurable turnover.

Option 2: a leading national capacity exchange emerges in the UK. Assumptions and calculations are based an exchange comparable to the Swiss WIR. The middle range calculations are based on the participation of 1 in 5 UK SMEs, taking into account recent UK GDP and relevant economic data for SMEs (BIS, February and October 2010). If successful, such an exchange could potentially make a tangible contribution to the UK economy and wider society. For a less volatile economy the option inputs centred on assuming UK GDP of £1.336 trillion (2010) reducing its annual volatility by 0.1% from 6.81% to 6.74% on long-term growth rates of 1%. Job creation and benefits are high for the level of investment, principally because small improvements in market access and capacity utilisation have a very high impact. By 2020, such a national capacity exchange could increase credit supply by

[68] Based on annual reports of existing corporate and retail barter exchanges.

between £15 billion and £80 billion, generate between £5 billion and £20 billion of annual increased sales and possibly create between 50,000 and 150,000 jobs.

Option 3: one, but possibly several, multilateral capacity exchanges, based in the UK, operating internationally, with government 'fostering' principally through active oversight. The proposition draws on three models which have been discussed in this report: an exchange operating at a global scale (Ormita); an innovative proposition aiming to target large multinationals and other listed companies (Recipco™); and a 'trade exchange of trade exchanges' using a single common tender across multiple membership bases (Universal Currency). If similar exchanges were successfully established with headquarters in the UK, benefits could potentially be substantial, although many of these would be diffused globally. For a less volatile global economy the option inputs centred on assuming G8 GDP of £22.13 trillion (2010 estimate) reducing its annual volatility by 0.1% from 1.75% to 1.74% on long-term growth rates of 3.79%. This result does not scale linearly with a single nation as the G8 GDP already has lower volatility. Option 3 is neither optimistic nor pessimistic, but a highly optimistic estimate might be that, if a hub of capacity exchanges in London took a 20% share of an assumed £160 billion multi-sector global capacity exchange market, then based on a rough 5% operating cost ratio the hub could comprise operational businesses with turnover of £1.6 billion creating as many as 7,500 jobs to 15,000 jobs.

10.3 Potential Costs and Constraints to Participation

Potential constraints were broadly related either to the operational set-up of the exchange or to the implications that multilateral reciprocal trade may have in terms of accounting, tax and competition.

10.3.1 Operational set-up

Respondents with experience in setting up exchanges indicated that there would be no theoretical problem with trading heterogeneous goods and services for other goods and services. If the exchange were to be fully automated though, the contracts would need to be standardised to the extent that they could be automatically matched without the need for a broker or other third party. Such an exchange could therefore involve a lengthy lead-time before it would be able to launch.

Respondents did not consider that clearing, settlement or delivery risks would be a constraint to participation, as long as sufficient guarantees (such as escrows) were in place within the contracts and with the exchange to ensure that the failure to fulfil a trade would be unlikely. Some respondents suggested that the membership dynamic of a capacity exchange would be likely to influence participants' behaviour positively: as long as they saw a benefit to being within that membership group they would be unlikely to conduct themselves in a way that would deter other members from trading with them. On the other hand, affinity fraud – undertaken by individuals with a close affinity to other individuals – might equally be an outcome of such a membership system, using the trust which underpins it as the very cover for perpetrating the fraud.

A number of respondents were concerned that multilateral reciprocal trade would pose a problem both for accounting departments and for taxation purposes. In the UK, current accounting standards are sufficient to account for such trades as long as

their equivalent value in sovereign currency can be calculated (see table 8.6). Likewise, companies must declare this value for the purposes of corporate tax, which is applied on barter transactions as it is on cash-based transactions. It is likely that concerns relating to tax and accounting pose problems that are more perceived than real. Potential participants would need to be reassured that issues relating to accounting and taxation of goods and services traded on the exchange would not negate other potential benefits and discourage their participation.

Governance of the exchange was highlighted by a number of respondents as a key factor in making it attractive to potential participants. The exchange would need to demonstrate that it can be trusted not to over-issue common tender (e.g. deficit spending) and to act to prevent corruption or fraud that may arise through the issuance of credit.

The significance of competition rules (see appendix 15) is also important for a capacity exchange. Although most respondents did not think that they would pose a serious constraint to participation, for example if membership of the exchange was open, a capacity exchange would need to ensure that it was compliant with relevant competition law.

10.4 Potential for wider sustainability

Theoretically, it is assumed that increased levels of trade contribute to wider macroeconomic stability by improving the gains of consumers in individual households. An assessment of the quantitative impact of increased trade in this respect reveals some interesting figures for the USA where researchers estimated that "the expanded availability of imported goods and services from increased trade has had a cumulative aggregate benefit to U.S. consumers" amounting to approximately US$2.3 trillion over 1992-2002 (in 2002 dollars), approximately 2.5% of the total inflation-adjusted ('real') GDP over the same period (Langenfeld and Nieberding, 2005). "The contribution of trade to consumer welfare has grown as trade has increased. The real gains from trade to U.S. consumers in 2002 were almost six percent of 2002 U.S. household real median income (US$42,409), or about US$2,500 per household" (Langenfeld and Nieberding, 2005). The United States is the largest trading nation in the world, with US$1.3 trillion in exports and US$1.9 trillion in imports (Greyhill Advisors, n.d.). In order to grow the GDP of a country by even a small percentage, a capacity exchange might need to be trading very significant sums, which has not been the case to date.

The extent to which capacity exchanges could contribute in other ways – such as helping to reduce wastage and storage, and to co-ordinate in-kind donations to charitable organisations – was also explored with interviewees. Most agreed that an increase in the trade of unused or excess capacity would contribute to reduced wastage. Respondents were more cautious about the benefit of reduced storage. One respondent noted that, although this may be an end result of significant levels of trade on a capacity exchange – if goods were in demand to the extent that they could be traded before they were stored, for example, – the closure of storage warehouses which might usually have stored these goods would result in job losses, and could not therefore be seen as an unqualified benefit.

If capacity exchanges were able to materially contribute to increases in trade, or allow companies to maintain trading levels in times of crisis, they might be seen to

contribute to wider growth and macroeconomic stability. Some respondents raised the idea of capacity exchanges building social capital, harking back to an earlier point that trade is often related to a sense of community. By increasing credit, trust and employment, a more cohesive society would develop which has significant value, though it seems impossible to provide a quantitative estimate of such value.

10.4.1 Procurement and donation source for charitable sector

Respondents working in the charitable sector responded positively, in theory, to the potential for a capacity exchange not only to enable the efficient provision of in-kind donations but possibly to be a source of procurement, in particular for disaster relief. Capacity exchanges were thought to be of less potential use to development aid organisations, unless they were established at a local level and with local connections in areas of need; however, it was agreed that capacity exchanges could potentially be of use in sourcing stock from warehouses that store equipment which is often in demand at very short-notice for disaster relief.

The provision of in-kind donations tends to be the result of a long-term relationship between a charitable organisation and its corporate donor team, so it was thought possibly unlikely that an 'impersonal' forum such as an electronic B2B exchange would be a source of such donations. Nonetheless, respondents were "very open" to its potential as a source of donation capital, particularly as this might prove to be a more efficient way of receiving such donations. Data collected by the Committee Encouraging Corporate Philanthropy (CECP) indicates that, in the USA, corporate non-cash (i.e. in-kind) donations increased by 16% over the year 2008-2009 (CEPC, 2010: 12). Yet charities often cannot make use of the particular goods and services on offer, making in-kind donations less useful (McCaffrey, 2011). Were a capacity exchange to be established at sufficient scale, it could offer a solution to this problem by allowing companies to donate the common tender that they receive for the goods and services that they would have donated, and allow the organisation to spend that credit within the exchange for goods and services that they could actually use.

Conversely, "in other instances, businesses that do not belong to a trade exchange may donate product directly to a charity. Often the charity has to refuse the donation as they have no use for the goods or services on offer. 'Barter savvy' charities will generally accept the item and sell it into their trade exchange for barter dollars. They will then use the barter dollars to offset their regular case expenses" (Barter is Back, 2010).

10.4.2 Fraud

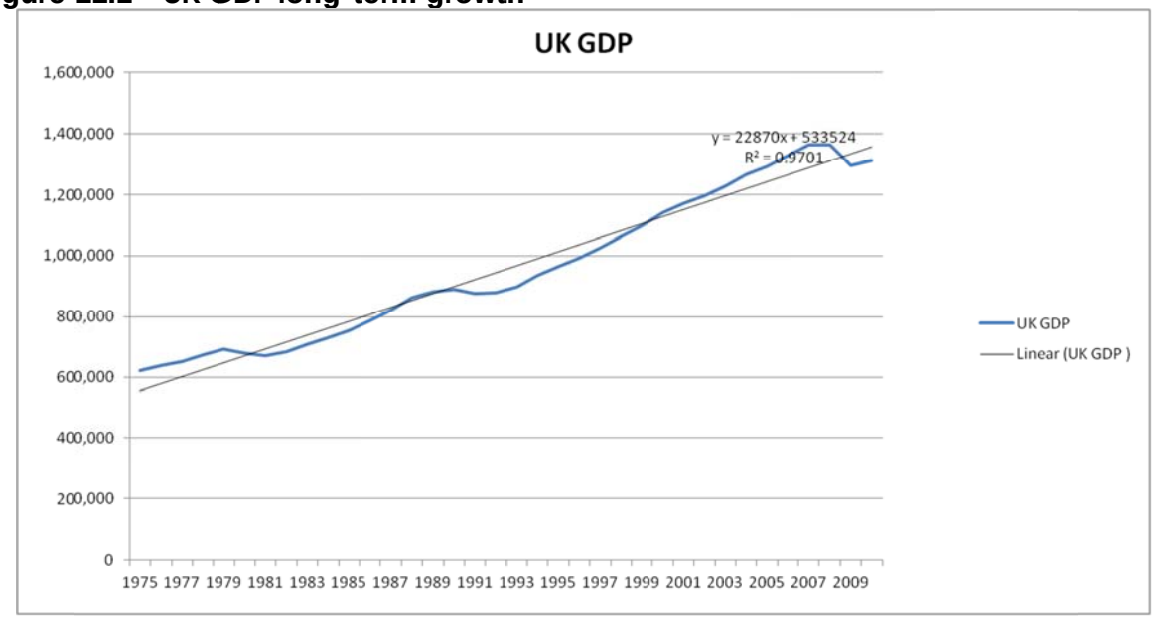
Respondents were divided about the possibility for a capacity exchange to reduce fraud, or at least to do so more effectively than any other trading mechanism currently does. While it is likely that capacity exchange as envisaged in chapter 10 would reduce instances of fraud within the multilateral reciprocal trade industry as it exists today, by increasing transparency and accountability and encouraging 'best practice' among competitors, a number of respondents suggested that, as with any new trading mechanism, fraud could potentially be more of a cost than a benefit, at least in the early phase of establishing an electronic platform for a capacity exchange. The recent example of the cyber attacks on the EU Emissions Trading Scheme (ETS), where hackers accessed the registry system and illegally transferred emissions allowances between accounts, was frequently cited (Europe, 2010).

Government policy on cyber-terrorism and cyber-crime could aid the formation of capacity exchanges, but doesn't seem a material gap at the moment.

10.4.3 Volatility reduction

One potential method for estimating the benefits of volatility reduction in GDP growth is to use 'real' or 'risk/reward' options. This approach is in its infancy, but has been used from time to time to estimate the benefits of reduced volatility at social or whole economy levels (The Economist, 2001). The long term growth of 35 years of UK GDP in thousands of £ adjusted for inflation (Office for National Statistics, 2010) is set out in figure 11.1, beginning at £621 billion in 1975 and ending at £1.313 trillion in 2010.

Figure 11.1 – UK GDP long-term growth



Compound UK growth over the period has been 1% per annum. A simple linear regression (origin £533,524 billion) provides a slope with a growth rate of £22.870 billion per annum. The standard deviation of growth against the trendline has been 6.81%. Using a basic Black-Scholes equation (setting the stock price as £1.313 trillion and the strike price as £1.336 trillion), an annual option value guaranteeing trendline growth would be in the order of £41 billion. This use of an option is a crude estimate of the cost of volatility for 'investors', treating the UK as 'UK plc'. If a capacity exchange of some significance was able to reduce that standard deviation by 1%, i.e. to 6.74%, then the option value is in the order of £40 billion. In real option theory reducing volatility by 0.1% has an annual value of some £1 billion. For a flavour of the sensitivity, at a reduction in the deviation of growth by 10%, i.e. to 6.13%, the option value declines to £37 billion and the annual value of reducing volatility rises to £4 billion. These are 'heroic' calculations, but represent an attempt to gauge the gains from small reductions in volatility through better capacity usage. £4 billion constitutes significant 'wider' benefits on an annual basis, but is based on national capacity exchange of some significance.

10.5 Consensus on the potential benefits of a multilateral capacity exchange

Given the lack of data for the existing multilateral reciprocal trade industry, the analysis presented here has relied on estimates drawn from the views of the experts and sector participants consulted for this project. Most respondents agreed that, given appropriate regulatory structures and good governance, a capacity exchange could offer some potential benefits, in terms of both trade gains and increased wider sustainability. Not all respondents agreed that multilateral reciprocal trade would operate very differently from traditional trading channels, however, and suggested benefits of reduced currency volatility or lower inflation were unlikely to materialise. A significant number of participants suggested that capacity exchanges could only ever be complementary to existing trading channels, a few percentage points of overall trade, suggesting that their potential to fulfil the asserted wider benefits may be restricted.

11 Policy Implications

This chapter outlines the potential implications of multilateral reciprocal trade for policy makers. It looks specifically at the possible need for regulation of both capacity exchanges and common tender. It considers what regulation is already in place that may encourage or deter capacity exchanges from the UK, and examines the relevance of three possible regulatory models. The chapter highlights the importance of reputational integrity and governance of the multilateral reciprocal trade industry and goes on to assess the particular attributes of the UK that make it a potential host country. It concludes by offering some guidance and recommendations to UK policy-makers.

The policy implications of capacity exchanges are likely to vary according to their design and the scale at which they operate. At an international level there will possibly be issues relating to the interaction of capacity exchanges with different national regulatory frameworks. Much will depend on the membership structure and the scope of the capacity exchange as well as the regulatory framework applying to transactions. If operating at an international level, the capacity exchange and its members would have to consider relevant trade liberalisation agreements such as the WTO and GATT (General Agreement on Tariffs and Trade) agreements.[69]

During the research, somewhat oddly in today's 'too much regulation' environment, there were calls for regulation of both capacity exchanges and common tender. Regulation, whether voluntary or mandatory, could strengthen the operational integrity and credibility of capacity exchanges and to some extent act as legal reference to prospective members. Regulation could cover exchanges in general (possibly unnecessary), or common tender (possibly very useful). Numerous respondents, from existing exchanges to potential customers welcomed the idea of regulation. One large procurement specialist said, "*I like the idea of regulation of [common tender] and it might make us feel warmer to what are, in appearance, fringe operations with funny money*". Given the findings of a recent report by Transparency International, indicating that "although corruption may not be widely prevalent in the UK, there is a disturbing state of complacency, and even denial, about the existence of the problem in key UK institutions and sectors" (Krishnan and Barrington, 2011: 8), it is appropriate in the current environment to consider the possible role for regulation of this sector.

Prior to the global financial crisis of 2008, the dominant paradigm was "based on the optimality of free markets, checked by minimal regulation aimed at countering inefficiencies due to externalities and imperfect information" (Davis, n.d.: 2). In the wake of recent financial crises, "there is a sense that regulation needs to be founded on a different (but not yet well developed) paradigm regarding the compatibility of unregulated operations of financial markets with financial stability" (Davis, n.d.: 3) As concerns to maintain financial stability are still very much in the foreground of discussions about the role of financial markets and the behaviour of the organisations that constitute them, it might be counter-productive to put capacity exchanges under financial regulation (which is still fighting past battles and possibly not conducive to a forward-looking industry).

[69] http://www.wto.org/english/docs_e/docs_e.htm

11.1 Regulatory models

11.1.1 Existing regulation of potential relevance

Specific aspects of current FSA regulation that are of potential relevance to capacity exchanges issuing common tender include both regulation of e-commerce and regulation of payment services. Electronic money normally refers to deposits of sovereign currency held electronically. As capacity exchanges are likely to facilitate and hold some sovereign currency electronically, it is possible that a capacity exchange operating on a web-enabled platform may be deemed to be issuing electronic money. Electronic money is defined as:

"monetary value as represented by a claim on the issuer which is:
(i) stored on an electronic device;
(ii) issued on receipt of funds of an amount not less in value than the monetary value issued;
(iii) accepted as means of payment by undertakings other than the issuer" (EU Directive 2000/46/EC).

Of significance to a capacity exchange would be the definition of "funds" which is defined in the same article as banknotes and coins, scriptural money and electronic money (EU Directive 2000/46/EC). Should a capacity exchange issue credit or common tender as an accounting unit only, then it may be outside of the scope of existing regulation.

Queries directed to the FSA about whether current regulation covers the issuance of credit or common tender through a capacity exchange suggested that this would possibly be covered by Article 4 of the Payments Services Directive (PSD) (EU Directive 2007/64/EC). Annex 3, Schedule 1, Part 2 of the PSD identifies activities which do not currently constitute payment services. These include services based on instruments that can be used to acquire goods or services only "under a commercial agreement with the issuer, either within a limited network of service providers or for a limited range of goods or services, and for these purposes the "issuer" is the person who issues the instrument in question" (FSA, 2009). Further correspondence on this topic suggested that, should common tender issued by a capacity exchange become "a medium which, by practise, freely passes through the community in final discharge of debts and full payment for goods and services, being accepted equally without reference to the character or credit of the person who offers it and who in turn can tender it to others in discharge of debts or payment for goods or services, even though it may not be legal tender", then the exchange operator may be obliged to seek authorisation to operate from the FSA[70] . Regulation of the issuance of common tender could therefore fall under financial services regulation although it currently appears not to.

There are three regulatory models which could be applied to a capacity exchange, or hub of exchanges, were these to be established in the UK: self-regulation, government (probably financial services) regulation and standards regulation, such as an ISO-style accreditation/certification market using certifying bodies. The options are outlined in table 12.1 according to criteria of governance, monitoring, feed-back, feed-forward, process and quality.

[70] Email from FSA, September 13, 2011.

Table 12.1 – Regulatory models

	Self-regulation	Government regulation	Standards regulation
Governance	Membership	Government	Stakeholders
Monitoring	Variable	Inspection	Regular
Feed-back	Conformist	Sanction	Reputation
Feed-forward	Reactionary	Political	Evolutionary
Process	Minimal	Inquisitory/Adversarial	Service purchase
Quality	Asserted	Budgetary	Published
Costs	Subscription	Levy	Market

11.1.2 Self-regulation

The broad objectives of regulation are to preserve market integrity (fair, efficient and transparent markets), to preserve financial integrity (reduce systemic risk) and to protect investors, with the understanding that specific elements should be tailored for the regimes of particular markets (IOSCO, 2007: 2). The 2007 report by International Organization of Securities and Commissions (IOSCO) highlights the benefits of self-regulation but also states that "where its role is significant, it almost invariably derives from a long track record of responsible behaviour, under the oversight of statutory regulators" (IOSCO, 2007: 1). Although self-regulation is an option for a capacity exchange, given the IOSCO comments and the relatively immature nature of the majority of the multilateral reciprocal trade sector, self-regulation seems unlikely to be considered sufficiently robust to attract participants at scale.

The existing retail barter industry is currently attempting to self-regulate through membership of trade associations such as IRTA and NATE. IRTA's mission is to provide "an ethically based global organization" which advances the industry "through the use of education, selfregulation, high standards and government relations"[71]. Part of its role includes lobbying for legislation related to the retail barter industry, including requests for legislation to legitimise it. Both IRTA and NATE offer a Registered Trade Broker (RTB) certification and a Certified Trade Broker (CTB) certification; NATE's website states that "every leader of a trade exchange should be a CTB without exception". The RTB programme was established as recently as September 2010 "to offer much needed education for individuals who are new to the Modern Trade and Barter Industry"[72]; and IRTA has also recently approved and adopted a new Ethics and Conduct Code, violation of which could result in suspension or a 5 year ban for member exchanges.

The extent to which the actions of NATE and IRTA are having positive effects is difficult to assess, but anecdotal evidence from respondents in the sector indicated that trade associations had little impact on behaviour across the industry as a whole, even if their own members abided by guidelines and codes of best practice. IRTA counts 86 members in an industry for which population estimates range from 700 to

[71] http://www.irta.com/about-irta.html
[72] http://www.irta.com/certification.html; http://www.natebarter.com/certified-trade-brokers

800. The proportion of the industry which IRTA claims to influence is approximately 11%. Anecdotal evidence from IRTA also suggests that they are struggling to make an impact on behaviour, with 185 out of 300 retail barter exchanges apparently known not to be reporting transaction volumes to the Inland Revenue Service (IRS) in the United States.

11.1.3 Government regulation

Were a capacity exchange to be regulated by government this could be within the context of financial services regulation, particularly since a capacity exchange may be issuing its own currency. At an international level, the UK bodies represented on the Financial Stability Board (FSB) are the Financial Services Authority (FSA), the Bank of England and HM Revenue and Customs.[73] The role of the FSB is to coordinate at an international level the work "of national financial authorities and international standard setting bodies and to develop and promote the implementation of effective regulatory, supervisory and other financial sector policies."[74] FSB regulation could become relevant if capacity exchange activity achieves traction at an international level. Yet, for a largely ill-formed, nascent industry with a dubious reputation, it may be too early for direct government regulation. A more appropriate approach would seem to be to build the need for capacity exchanges first and then to consider whether there is a role for government regulation.

11.1.4 Standards market regulation

A third option is standards market regulation using accreditation and conformity assessment.[75] Used in a number of areas (e.g. shipping, fire safety, airlines, automotives, railways, electricity, food safety and health) this model encourages open standards where development of the standard is a structured, inclusive process involving interested stakeholders.

Standards can be developed either through an authorised and independent accrediting body for certification agencies such as the United Kingdom Accreditation Service (UKAS); or with industry mutuals such as the Programme for the Endorsement of Forest Certification (PEFC) for sustainable forestry. UKAS is the independent UK body that assesses organisations which provide certification, inspection, testing and calibration services.[76] UKAS 'accredits' 'certification bodies' who inspect willing customers. Accreditors regulate the market and ensure the separation of standards development from the commercial elements of implementation and review. Certification bodies (such as the British Standards Institute, Lloyd's Register, Det Norske Verita) normally inspect or certify against a standard, often a standard managed by the International Standards Organisation (ISO) which comprises a network of national standards institutes in 162 countries and develops and publishes international standards.

Standards markets are a free market response to regulation. If the certification bodies are too hard, they get no clients. If the certification bodies are too soft, their brands suffer and they may lose their accreditation. The standards market

[73] http://www.financialstabilityboard.org/members/links.htm
[74] http://www.financialstabilityboard.org/about/overview.htm
[75] Declaration: one of the report authors is a non-executive director of United Kingdom Accreditation Service (UKAS), the UK's national sole accreditation body for certification, testing, inspection and calibration services, effectively the UK regulator.
[76] http://www.ukas.com/about-accreditation/about-ukas/

regulation model is used in finance, e.g. ISO 22222 (personal financial planning) and AS3806 (financial services compliance); various IT standards such as ISO 27000 (information systems security); and by firms which obtain ISO 9000 (quality management) or ISO 14000 (environmental management), though certainly not as widely as in other industries.

11.2 Reputational integrity and governance

The importance of governance is highlighted by the OECD as playing "a vital role in underpinning the integrity and efficiency of financial markets. Poor corporate governance weakens a company's potential and at worst can pave the way for financial difficulties and even fraud. If companies are well governed, they will usually outperform other companies and will be able to attract investors whose support can help to finance further growth" (OECD, 2011b: 1).

The reputation and integrity of a capacity exchange are two key factors which will make or break its acceptance, especially in its initial phase, by potential participants and other relevant parties (such as tax and accounting authorities), and its long-term success. One of the potential obstacles to the establishment of a capacity exchange, or hub of exchanges, will be that the concept is unfamiliar. The responses of our interviewees highlighted the extent to which new concepts may be slow to get off the ground due to a lack of understanding or unfamiliarity.

A solid reputation and governance structure would help to alleviate some of the potential issues concerning capacity exchanges, in particular the issuance of credit. Educational outreach to prospective corporate members and government agents might equally assist in promoting capacity exchanges.

11.3 Location: London's potential to host a capacity exchange or hub

London is the world's leading global financial centre in terms of indicators which include business environment, people, taxation and infrastructure (Yeandle, 2011).

London is a leading source of capital and expertise in legal and accounting services and dispute resolution (Europe Economics, 2001: 6). The legal jurisdiction for international trade was raised by respondents as a key advantage for London. Home to the London Court of International Arbitration[77], London is a globally recognised arbitration centre, suggesting that it provides efficient and cost-effective commercial dispute resolution mechanisms. English common law is one of the major factors identified in assessments of London's attractiveness for financial services and other businesses to establish themselves there (see for example Europe Economics, 2011: 4; Clarke MP, 2011).

The City UK produces a monthly City Indicators Bulletin with indicators including job vacancies, the office market, volume of UK business, newly authorised FSA firms, new employment of FSA authorised people and a range of financial market indicators (The City UK, 2011). London-based, and particularly City-based, firms can count on a large pool of employees looking to work in the financial services sector who could be assumed to be particularly suitable candidates to contribute to the establishment of a capacity exchange market.

[77] http://www.lcia.org/Default.aspx

Given the concept of multilateral reciprocal trade, one possible approach to the establishment of a capacity exchange industry would involve UK trade, regulation and tax authorities developing a comprehensive approach to multilateral reciprocal trade. This would include developing an environment in which such trade could be carried out with sufficient guidelines and oversight to make it a competitive and attractive market. The particular aspects that would need to be considered include:

11.3.1 Immigration

Should a capacity exchange want to establish headquarters or branches in the UK, a number of considerations would need to be taken into account, especially when employing non-European Economic Area (EEA) staff. This is of particular relevance to existing exchanges with international ambitions most of which originate in Australasia or North America. First the exchange would be likely to require an Employer Sponsorship License (see UK Visa Bureau, n.d.) in order to set up a business in the UK and employ non EEA nationals. Second, such citizens would be required to apply for the points based system (PBS), a sometimes quite lengthy and complex process designed to filter migration according to the UK's priorities and needs (see Business Link, n.d.). It is likely that the Home Office and other relevant bodies such as the UK Border Agency and the UK Visa Bureau would have to clarify specific requirements, if any, that potential exchanges must meet.

11.3.2 Support from UK government bodies

Given the nature of the multilateral reciprocal trade industry to date, which is not treated formally by bodies such as the WTO (see Howse, 2010), trade participants will need to be reassured about the extent to which they can rely on long-term support. For example, should the economic climate improve, it is possible that governments may be less inclined to foster emerging architectures of trade within an industry which, as yet, does not have a particularly 'solid' grounding at the national or international level or formal support from trade bodies and government agencies. Industry bodies could have an important role in providing that support.

11.3.3 Openness to trade in a globalised world

"The UK economy is built on trade and openness" (BERR and DFID, 2009: 4). Through active participation at the international level, such as the WTO, the European Union and other multilateral and bilateral fora, the UK is in a position to promote trade opportunities and support economic growth. The extent to which a capacity exchange host country is connected to international regulatory forums and takes a proactive stance towards promoting business and trade can contribute positively to its attractiveness as a place to conduct business. In 2011, the UK ranked 4th out of 183 countries in the 'ease of doing business' rankings, investigating regulations that enhance business activity and those that constrain it, compiled by the International Bank for Reconstruction and Development (IBRD) and World Bank (IBRD and World Bank, 2011).

11.3.4 Procurement opportunities and impacts for Governments

The UK Government's role in assisting capacity management and competition within markets in which it has significant purchasing power was the subject of a review in 2002 by the Office of Government Commerce (OGC), commissioned by the Chancellor of the Exchequer. Recommendations included "a more systematic and strategic approach" to the markets in which the public sector operates, which does

not focus solely on individual procurements" (OGC, 2003). Since government actions "can either help or hinder the ability of suppliers to undertake effective capacity planning and, in areas where public sector business accounts for a sizeable chunk of overall demand, can have a significant impact on the market's shape" (OGC, 2003), government involvement in the early stages of a capacity exchange could significantly impact on how that market develops.

The recent response of the UK Government to the European Commission Green paper on the modernisation of EU public procurement policy identifies its aspiration to award 25% of government contracts to SMEs (UK Government, 2011). Were SMEs to form a significant part of a capacity exchange membership this may present a possible avenue for government to achieve part of that goal.

11.4 Guidance and recommendations to UK policy-makers

This chapter has discussed the existing regulatory environment which may have implications for the multilateral reciprocal trade sector, and has also considered how the sector might be helped to improve and to attract participation through the development of standards marker regulation. Taking into account the potential benefits such an industry could bring to the UK (including jobs and tax receipts as well as increased trade activity and credit supply), the novelty of the capacity exchange value proposition and possible gaps in existing regulation, five overarching recommendations are to:

- improve the understanding of multilateral reciprocal trade;
- consider the scope for regulating common tenders;
- consider the scope for regulating capacity exchanges;
- consider establishing a centre of excellence through an 'office of capacity exchanges'; and
- consider the opportunity to integrate capacity exchange policies with wider government policies.

These recommendations can be considered in relation both to how beneficial multilateral reciprocal trade is perceived to be (see chapter 11) and how high up it could feature on the policy agenda in the near future. Table 12.2 lays out the regulatory options for each recommendation as well as the outcomes sought.

Table 12.2 – Policy recommendations and options summary

Policy recommendations	Options	Desired outcomes
1. Improve understanding of multilateral reciprocal trade **HIGH importance**	**Government monitoring and information disclosure through:** ♦ HMRC tax filing; ♦ Office of National Statistics; ♦ annual survey of capacity exchanges, corporate participants.	♦ further understanding of capacity exchanges, related risks and opportunities; ♦ improve data monitoring, consistency and disclosure; ♦ monitor evolution of capacity exchanges; ♦ monitor impact on

Policy recommendations	Options	Desired outcomes
		wider economy.
2. Regulation – common tender **HIGH importance**	**Government regulation options via:** ♦ FSA and e-commerce or payment mechanisms; ♦ Bank of England and supervision of credit institutions. **Standards market regulation options via:** ♦ accreditation and third party certification/standard bodies; ♦ indemnification via insurance or re-insurance. **Self-regulation options via:** ♦ industry trade body.	♦ build confidence in the market through government support; ♦ prevent fraud (e.g. deficit spending); ♦ oversee volume of issuance and backing mechanisms; ♦ provide a legal reference for potential users/ members.
3. Regulation – capacity exchange **MEDIUM importance**	**Government regulation options via:** ♦ FSA and e-commerce or payment mechanisms; ♦ Bank of England and supervision of credit institutions; ♦ trading standards. **Standards market regulation options via:** ♦ accreditation and third party certification/standard bodies. **Self-regulation options via:** ♦ industry trade body.	♦ improve credibility and integrity of the industry; ♦ develop standards of business conduct; ♦ advise on tax treatment and obligations.
4. Establish a centre of excellence through an 'office of capacity exchanges' **MEDIUM importance**	**Provide support by**: ♦ establishing a business network for capacity exchanges; ♦ promoting dialogue with relevant government bodies and officials; ♦ promoting cooperative indemnity vehicles, e.g. mutual insurance, indemnity insurance; ♦ promoting research into the economics and technology of capacity exchanges; ♦ encouraging discussion of the emergence of common tender at a time of likely shifts in international monetary systems; ♦ developing adequate education programmes for trade and procurement professionals. **Provide guidance on key issues including**: ♦ insolvency and wind-up arrangements; ♦ client asset protection rules; ♦ taxation; ♦ compliance with anti-money laundering regulations; ♦ anti-counterfeiting and grey market	♦ build confidence in capacity exchanges; ♦ encourage participation; ♦ provide reassurance to current and prospective participants; ♦ improve visibility and credibility of the industry

Policy recommendations	Options	Desired outcomes
	problems; ♦ credit and Basel III implications; ♦ best execution requirements; ♦ links with other UK e-commerce initiatives on payment.	
5. Integrate capacity exchange hub policies with wider government policies **MEDIUM importance**	**Integration with:** ♦ procurement in general – all government procurement department functions and agencies; ♦ promotion – UK Trade & Investment; ♦ innovation and research – BIS; ♦ technology – Technology Strategy Board; ♦ immigration – Home Office, UK Border Agency, UK Visa Bureau; ♦ competition – Office of Fair Trading.	♦ increase attractiveness of capacity exchanges for existing organisations with international operations.

The first policy recommendation **– "improving the understanding of multilateral reciprocal trade"** – is deemed necessary in light of the novelty perceived complexity of capacity exchange operations. By providing guidance, government agencies could further the understanding of multilateral reciprocal trade, the associated risks and opportunities and requirements for participants. By monitoring and requiring consistent disclosure on such trade, government could get a clearer picture of the evolution of capacity exchanges and monitor periodically the actual impact on the wider economy.

Should the UK see sizeable prospects for economic growth and job creation through multilateral reciprocal trade, it could support regulation of either common tender or capacity exchanges. At a time of growing interest in monetary policies, sovereign currency stability and emerging propositions for alternatives to sovereign currencies (e.g. LETS, digital currencies and other common tenders used in trade), the second policy recommendation **- "regulation of common tender"** - in particular its issuance and liquidity management, could help to prevent fraud and inform the monitoring of common tender supply and backing mechanisms.

Given the diversity in scope and breadth of existing and emerging forms of multilateral reciprocal trade, the third policy recommendation - **"regulation of capacity exchanges" -** could be seen as a desirable step towards supporting their development at scale and harmonising practice across the industry. Again, regulation could be mandatory or voluntary. In light of low membership levels in existing industry bodies, standard market regulation through accreditation might be more effective in encouraging take-up and steering practice.

Should capacity exchanges develop at scale in the UK and globally, government may see an opportunity to take the lead in supporting multilateral reciprocal trade by **"establishing a centre of excellence through an 'office of capacity exchanges'.** Such an office could take the form of an independent body whose activities could encompass both support – establishing a network for capacity exchanges, steering dialogue with government agencies, promoting best practice and advocacy, and

developing training and other capacity-building efforts; and guidance on critical issues – including on taxation, compliance, credit and Basel III implications and linking with other UK e-commerce initiatives.

Over time, and as the industry follows, government could progressively **"integrate capacity exchange regulatory initiatives"** with wider government policies to maximise efficiencies. Relevant government arms could include UK Trade & Investment (UKTI), the Department for Business Innovation and Skills (BIS), the Technology Strategy Board, the Home Office, UK Border Agency and the Office of Fair Trading.

11.5 Conclusion and areas for further research

Multilateral reciprocal trade is an emerging sector that has the potential to create complementary credit systems alongside traditional financial credit. Capacity exchanges are clearly at an early stage of development, with diversity in approaches, participants, industries and scale. Capacity exchanges appear to have the potential to increase trade and growth, and to provide other economic and social benefits. It is clear that such potential is tied to the faith participants place in the exchange model and in common tender, as well as levels of liquidity. If capacity exchanges were formally recognised, a more solid regulatory framework might encourage more rapid development.

Policy makers are generally unfamiliar with multilateral reciprocal trade. This research has identified significant gaps in data and understanding. UK academics pointed out that most existing research ignores or misses multilateral reciprocal trade. Equally, export and other economic statistics fail to provide a fair account of existing multilateral reciprocal trade in terms of type, volume, scale and value. These gaps in understanding are partly explained by the lack of definition, the variety of forms of multilateral reciprocal trade and the difficulties of acquiring statistical data. A barter deal between two corporations might only appear in trade statistics as shipping tonnage. A barter deal between two corporations within a country might not appear in official statistics at all.

Suggestions for further research will depend to a great extent on the efforts put into improving data sources for further analysis, particularly in order to model the issuance and performance of common tender, levels of liquidity on a capacity exchange and any counter-cyclical impact in relation to the mainstream monetary economy. Some useful further research might cover:

- possible applications of peer-to-peer currencies in B2B environments;
- consistent and systematic data collection on countertrade and multilateral reciprocal trade;
- behavioural trade decisions and perceptions of multilateral reciprocal trade value;
- stability and volatility of common tender compared to sovereign currencies under different conditions (e.g. one common tender, multiple sovereign currencies; multiple common tender, multiple sovereign currencies);
- modelling of socio-economic benefits of multilateral reciprocal trade, especially in relation to economic growth;
- modelling optimal pricing for capacity exchanges;
- better dynamic economic models of capacity, trade, credit and money.

12 Appendices

12.1 Appendix 1 – City of London Corporation

The City of London Corporation is a uniquely diverse organisation. It supports and promotes the City as the world leader in international finance and business services and provides local services and policing for those working in, living in and visiting the Square Mile. It also provides valued services to London and the nation. These include the Barbican Centre and the Guildhall School of Music & Drama; the Guildhall Library and Art Gallery and London Metropolitan Archive; a range of education provision (including three City Academies); five Thames bridges (including Tower Bridge and the Millennium Bridge); the Central Criminal Court at Old Bailey; over 10,000 acres of open spaces (including Hampstead Heath and Epping Forest), and three wholesale food markets.

It is also London's Port Health Authority and runs the Animal Reception Centre at Heathrow. It works in partnership with neighbouring boroughs on the regeneration of surrounding areas and the City Bridge Trust, which it oversees, donates more than £15m to charity annually.

12.2 Appendix 2 – Economic and Social Research Council

The Economic and Social Research Council (ESRC) funds research into major social and economic questions. We also develop and train the UK's future social scientists.

We are an independent organisation, but receive most of our £203 million funding (2011/12) through the Department for Business Innovation and Skills. We are one of the UK's seven research councils and work closely together with them under a framework provided by Research Councils UK (RCUK).

We value: Quality - Rigorous standards are applied to all the research and training we support. Our research often involves multidisciplinary teams, collaboration with other Councils, and frequently takes a long-term view. Our datasets, longitudinal and panel studies are internationally-acclaimed resources; Impact - Our research makes a difference: it shapes public policies and makes businesses, voluntary bodies and other organisations more effective as well as shaping wider society. Our knowledge exchange schemes are carefully devised to maximise the economic and social impacts of the research that we fund; Independence - Although publicly funded, our Royal Charter emphasises the importance of independence and impartial research.

Our activities are focusing on three priority areas which will be crucial to the economy and society over the coming years. This will ensure that the ESRC continues to apply the best social science research to the most important challenges facing the UK.

The three priorities are:

- Economic Performance and Sustainable Growth – to enable the development of robust government and private sector strategies to ensure the sustainable growth of the UK economy.
- Influencing Behaviour and Informing Interventions – to create a better understanding of how and why people and organisations make decisions, and how these can be managed or influenced.
- A Vibrant and Fair Society – to develop ways to enhance the role and contributions of citizens, voluntary sector organisations and social enterprises to create a vibrant national and global society.

12.3 Appendix 3 – Recipco™ Holdings

Recipco™ is the catalyst behind a global private-public sector collaboration to advance innovation in economic trade theory and monetary practice. It is the architect of a new capacity trading exchange (the Recipco Capacity Exchange™) designed to improve economic and social conditions worldwide.

The exchange serves as an international marketplace and transaction facilitator using a global trading currency, based on rigorous and accepted economic modeling, and backed in ways designed to inspire trust and confidence while contributing to a more inclusive, fair and just economy.

The Recipco Capacity Exchange™ provides a novel and efficient transaction mechanism for trade discovery and settlement that allows participants to profit by creating value from their unused and available capacity.

It is a non-cash trading platform that uses a *Universal Trading Unit*™ or *UTU*™ as the medium of exchange. The *UTU*™ is an independently administered, non-sovereign credit supply valued on the basis of trade flow between the organizations participating in the exchange. This special purpose trading currency can be used at any time to purchase capacity from others on the exchange. It is a system impervious to unpredictable monetary policies, exchange rate fluctuations and other constraints of the current economic system.

Although initially introduced to facilitate inter-party trade of untapped and available capacity between large well-respected organizations that bring trust and liquidity, it is equally applicable to all commercial and non-profit organizations without regard to size, credit status or geography. The efficient trading of such capacities brings participants increased revenue and operating margins, new sources of working capital and reduces an organization's dependence on traditional cash and credit.

The Recipco Capacity Exchange™ is a timely economic solution for the mobilization and exchange of value that advances common practices in economics, trade, money and governance to introduce a more inclusive and trustworthy mechanism of exchange. Timing for the introduction of Recipco™'s alternative and parallel market solution has never been more relevant, in large part due to the recent global economic crises, liquidity contagion, credit famine and the evident weaknesses of the world's current financial architecture.

If you don't have access to money, credit or liquidity it is very difficult to mobilise your capacity to trade and promote equitable wealth creation and distribution.

The Recipco Capacity Exchange™ offers a tangible solution with a solid business model, highly credible people and a clear path to a paradigm shifting economic architecture with the potential to improve economic and social conditions.

In order to realise this ambitious goal, Recipco™ has spent the past decade fostering relationships with a global community of thought leaders from the private and public sectors that bring their varied expertise to the development of this innovative approach to global economics. The Company is now preparing to introduce and scale this economic enterprise from its London base.

12.4 Appendix 4 – Acknowledgements

Many people contributed to this report which has been produced in collaboration with an inter-disciplinary, multi-national team of experts. The researchers are grateful for the assistance of the wider team, but any mistakes are the researchers' own. The research has also benefitted from the support and input of an Advisory Board. The researchers thank them for their time and valuable guidance. Finally, the researchers appreciate immensely the enthusiastic engagement of numerous interviewees whose contributions are noted throughout this report.

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12.5 Appendix 5 – Sample interview template

1. **Introduction and background to the research project**
2. **Your role and expertise**
    - Please describe briefly your current role and expertise;
    - Please describe briefly your organisation and the industry to which it pertains.
3. **Framework of assumptions – general discussion questions**
    - To what extent does your organisation have unused/excess capacity on an annual basis? If so, how does this impact on your company turnover?
    - To what extent is your company subject to short-term demand shocks? if so, how does your company address these fluctuations to meet demand?
    - To what extent would your organisation be interested in business-to-business exchange platforms either to source extra capacity or to sell/exchange excess capacity?
    - Considering the framework of assumptions (*please refer to the framework of assumptions*) to what extent do you agree/disagree with the assertions?
4. **Business capacity and credit – your organisation**
    - Has your organisation ever been involved in any non-monetary capacity exchange transaction with other companies?
    - To what extent could a multilateral capacity exchange be relevant in your industry? And within the markets within which you operate?
    - To what extent could participation on a capacity exchange affect branding (and reputation) as well as pricing models?
    - To what extent has your organisation ever used non-fiat currencies to facilitate transactions?
    - To what extent would the use of non-fiat currency on an exchange open up access to credit?
    - Under what circumstances you could imagine your organisation engaging in this type of transaction?
5. **Benefits from, and constraints to, participation on a capacity exchange**
    - What obstacles do you see to your organisation participating in a capacity exchange? *Please refer to "Constraints to participation".*
    - What benefits could participation in a capacity exchange generate for your organisation, your industry sector and wider society? *Please refer to "Benefits from participation".*
6. **Other issues and ideas**
    - Are there any other questions or aspects that have not emerged yet?
    - What is the major outcome from this study that you are looking for?
    - Do you have any suggestions of further research materials?

7. **Next steps**

12.6 Appendix 6 – Interview Table 1 "Framework of Assumptions"

	Assumptions	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
1	Companies have unused capacity in the form of goods, services & infrastructure					
2	Finding a way to trade this excess/unused capacity would be a big win					
3	Access to credit would help reduce excess capacity					
4	Access to credit is constrained in the current economic climate					
5	Constrained/limited access to credit is a recurrent problem beyond the current economic climate					
6	Business to business trade is impeded by a lack of access to credit					
7	Existing business to business exchanges are incapable or insufficient to address the excess capacity problem					
8	A generalised capacity exchange could help address these issues					
9	In business-to-business trade a private currency is as effective as, or more effective than, fiat currency					

12.7 Appendix 7 – Interview Table 2 "Benefits from participation"

	Not at all	Unlikely	Likely	Very likely
LEGAL				
Reduced fraud				
Other (please specify)				
SOCIAL & ENVIRONMENTAL				
Job creation				
Reduced waste				
Reduced storage				
Transfer of resources (e.g. humanitarian aid)				
TECHNOLOGICAL				
Innovation				
Other (please specify)				
ECONOMIC				
Increased liquidity				
Easier to address short-term capacity fluctuations				
Reduced currency volatility (if using non-fiat currency)				
Increased market penetration				
Additional distribution channels				
Improved competitiveness				
Other (please specify)				

12.8 Appendix 8 – Interview Table 3 "Constraints to participation"

	Not at all	Unlikely	Likely	Certainly
LEGAL				
Fraud (gaming)				
Enforcement & redress (e.g. due to bankruptcy)				
Other (please specify)				
POLITICAL/REGULATORY				
Clearing & settlement issues				
Tax liability (e.g. VAT)				
Governance of the exchange				
Accounting standards				
Auditing				
Other (please specify)				
TECHNOLOGICAL				
Scalability				
Logistics (e.g. delivery)				
Timings (e.g. expiry dates)				
Security				
Other (please specify)				
ECONOMIC				
Valuation of excess goods and services at any point in time				
Credit risk				
Transaction costs				
Money supply / currency issuance				
Competition				
Counterparty risk				
Other (please specify)				

12.9 Appendix 9 - Capacity exchange online survey results

The project team compiled a short online survey which was sent out via email to 200 retail and corporate barter exchanges in 59 countries. Of the exchanges contacted, 17 were based in the UK. The survey was designed to explore the geographic reach, membership type, size and volume of transactions and type of services currently offered by this industry, as well as the extent to which key industry sectors (such as media or telecommunications) feature on these exchanges.

26 organisations completed the survey, a response rate of 3%. Nine of the 26 respondents are members of the International Reciprocal Trade Association (IRTA). The responsive exchanges are based in the following countries:

Country	Number of respondents
Canada	4
Italy	2
New Zealand	1
Philippines	1
Puerto Rico	1
Spain	1
Switzerland	1
United Kingdom	1
United States of America	14
TOTAL	26

Analysis

- The vast majority of respondents identified media (including marketing and advertising), travel and transport and professional services as the key products traded over their exchange. Unsurprisingly, these were also identified as the industries of most financial value to the exchanges.
- While 95% of respondents identified the energy sector as an infrequent player on the exchange, 36% of respondents went on to highlight that transactions in this area nevertheless are of high financial value to their exchange.
- The telecommunications and logistics industries were identified as regular players of medium financial value to the majority of exchanges.
- The majority of respondents are based in the United States; correspondingly, this is also the country with the most coverage. The area with least coverage is Latin America, while one third of the exchanges cover Europe.
- Small and medium-sized enterprises comprise the majority of the membership while government agencies play a role on only two of the responding exchanges.
- Just over one third of respondents claimed that the value of trade on the exchange was worth between US$1 million and US$10 million; only two exchanges claimed that the value of trade on the exchange was greater than US$1 billion.

The results of the survey are detailed below.

Q1. Please describe the type of services that your exchange offers. (Select all that apply).

Response	All	
	Number	% of respondents
Corporate or media barter	14	54%
Retail barter	18	69%
Counter-trade (including offsets, counter-purchases etc)	2	8%
Other – barter exchange software	4	15%

Q2. Please specify the geographic reach of your exchange. (Select all that apply).

Response	All	
	Number	% of respondents
North America	19	76%
Latin America (central and south America)	4	16%
Europe	9	36%
Asia	7	28%
Australia and New Zealand	5	20%

Q3. Please specify the type of members that trade on your exchange. (Select all that apply).

Response	All	
	Number	% of respondents
Small and medium sized enterprises	25	96%
Large companies	14	54%
Companies listed on a stock exchange	9	35%
Private individuals	7	27%
Government agencies	2	8%

Q4. Please indicate how many members/clients traded on your exchange in 2010.

Response	All	
	Number	% of respondents
Between 1 and 100	5	19%
Between 100 and 500	10	38%
Between 500 and 1,000	2	8%
Above 1,000	9	35%

Q5. Please indicate the annual total value of transactions on your exchange.

Response	All	
	Number	% of respondents
Between US$1 and US$100,000	4	15%
Between US$100,001 and US$500,000	3	12%
Between US$500,001 and US$1,000,000	2	8%
Between US$1 million and US$10 million	9	35%
Between US$10 million and US$100 million	3	12%
Between US$100 million and US$1 billion	3	12%
Above US$1 billion	2	8%

Q6. Do you use trade credits on your exchange?

Response	All	
	Number	% of respondents
Yes	24	92%
No	2	8%

Q7a. Please define the level of participation of the following industries on your exchange.

Sector	Regular	Intermittent	Infrequent
	Number		
Energy	0	1	20
Travel and tourism	19	3	1
Paper and packaging	3	11	7
Media (including marketing, advertising)	22	1	0
Telecommunications	6	8	8
Logistics	2	8	10
Professional services (e.g. accounting, legal)	19	1	2

Sector	Regular	Intermittent	Infrequent
	% of respondents		
Energy	0	5	95
Travel and tourism	83	13	4
Paper and packaging	14	52	33
Media (including marketing, advertising)	96	4	0
Telecommunications	27	36	36
Logistics	10	40	50
Professional services (e.g. accounting, legal)	86	5	9

Q7b. Please define the value to your business of the following industries.

Sector	High	Medium	Low
	Number		
Energy	8	3	11
Travel and tourism	21	3	0
Paper and packaging	11	6	5
Media (incl. marketing, advertising)	21	2	1
Telecommunications	10	10	3
Logistics	8	5	9
Professional services (e.g. accounting, legal)	19	3	2

Sector	High	Medium	Low
	% of respondents		
Energy	36	14	50
Travel and tourism	88	13	0
Paper and packaging	50	27	23
Media (incl. marketing, advertising)	88	8	4
Telecommunications	43	43	13
Logistics	36	23	41
Professional services (e.g. accounting, legal)	79	13	8

List of countries in which the surveyed exchanges operate:

Argentina
Australia
Austria
Belgium
Brazil
Canada
Chile
China
Croatia
Cyprus
Czech Republic
Denmark
France
Germany
Greece
Hong Kong
Hungary
Iceland
India
Iran
Ireland
Israel
Italy
Jamaica
Kenya
Latvia
Lebanon
Malaysia
Mexico
Netherlands
New Caledonia
New Zealand
Nigeria
Norway
Ontario
Panama
Philippines
Poland
Portugal
Puerto Rico
Romania
Russia
Singapore
Slovakia
Slovenia
South Africa
Spain
Sweden
Switzerland
Thailand
Turkey
Ukraine
United Arab Emirates
United Kingdom
United States of America
Uruguay
Vietnam
West Indies
Zimbabwe

12.10 Appendix 10 – Examples of common tender used in trade

Type	Description	Backing	Users	Exchange rate? Convertible?	Ratio of acceptance
WIR francs (CHW)	Trade credits used within a trade exchange (retail barter) in this case the WIR multilateral commerce network. CHW are centrally issued by WIR Bank. In 2010, 1.627 billion worth of transactions made in CHW (WIR Bank, 2011).	Goods and services traded Loans issued.	B2B – over 60,000 SMEs in Switzerland	1 CHW = 1 CHF CHF can be converted into CHW but not the reverse.	Users define the ratio of acceptance of CHW for goods and services.
Linden dollars (L$)	Virtual currency used within a virtual economy and society online – Second Life.[78] Linden dollars are issued by the Linden Lab. Linden dollars in circulation were said to be "worth more than $165 million (US$) in its economy"[79] at the end of 2010.	Economic activity generated in the virtual world.	C2C, B2C – in Q4 2010 alone, over 750,000 unique users from around the globe spent more than 105 million hours experiencing Second Life.[80]	Exchange rate in US$ varies and seems to be a function of the willingness to pay for the currency by a potential buyer, the willingness to sell of a potential seller as well as transaction fees. Convertible both ways.	Mandated 100% acceptance as all payments on Second Life are made in Linden Dollars exclusively.
Ithaca Hours[81]	Local currency used within a B2C network of businesses and community	Strength of relationships within the community.	B2C – over 900 participants publicly accept	1 Ithaca HOUR = 10 US$ Not	Users define the rate of acceptance of Ithaca HOURS for

[78] http://secondlife.com/
[79] http://lindenlab.com/about
[80] http://lindenlab.com/about
[81] http://www.ithacahours.org/

Type	Description	Backing	Users	Exchange rate? Convertible?	Ratio of acceptance
	members in Ithaca, NY to foster local economic development. Over $100,000 worth of HOURS in circulation.		Ithaca HOURS for goods and services	convertible in US$	goods and services.
Universal Trading Units (UTUs™)[82]	Common tender proposed to facilitate trade within the Recipco™ multilateral capacity exchange. UTUs™ will be centrally issued by RecipcoClear.	Proposed backing by potential capacity of member companies of Recipco Clear.	B2B – targeted users include companies, government entities, not-for-profit organisations and international organisations.	N/A Presumably not convertible into sovereign currencies.	100% mandated acceptance within the Recipco Capacity Exchange™.
Bitcoins[83]	Experimental digital currency that enables instant payments, using peer-to-peer technology. Transactions and issuance management are carried out collectively by the network. As of May 2011, over 6 million of Bitcoins were in existence and the size of the Bitcoin economy was estimated at US$40 million. The	Price tags of merchants[84] – a price tag is a promise to exchange goods for a specified amount of currency.	N/A	As of May 2011, Bitcoins trade at US$ 6.70. The exchange rate seems to be a factor of users in terms of willingness to pay/to sell. Exchange rate varies across formal currencies	N/A

[82] http://www.recipco.com/
[83] http://bitcoin.org/
[84] A price tag is a promise to exchange goods for a specified amount of currency – as defined by Bitcoin FAQs
https://en.bitcoin.it/wiki/FAQ#What.27s_the_current_total_number_of_Bitcoins_in_existence.3F

Type	Description	Backing	Users	Exchange rate? Convertible?	Ratio of acceptance
	volume of Bitcoins issuable is capped at 21 million by the year 2140 (LAUNCH Blog, 2011).			and local and online exchanges.[85] Convertible both ways.	
VEN (see box 9.1)	Digital currency launched by Hub Culture social network – listed on Reuters currency trading screens	By Hub Culture which issues Ven at market rates and holds the value in reserve.	Members of the Hub Culture network.	As of September 2011, US$ 1 was trading for 9.35 Ven, and 1 Euro would buy 13.35 Ven (McCabe, 2011). Ven is not convertible to sovereign currencies.	N/A
Facebook Credits[86]	A virtual currency used by members of Facebook to purchase virtual goods related to Facebook applications (games) (Miemis, 2011). Credits can be purchased with sovereign currency or 'earned' by users.	N/A	Members of Facebook and third party developers.	1 credit is valued at US$ 0.1. Credits are not convertible to sovereign currencies.[87]	N/A

[85] For more information, see http://bitcoincharts.com/markets/
[86] http://developers.facebook.com/credits/
[87] The policy on converting Facebook credits does not appear to be discussed on their website. This information was retrieved at http://www.quora.com/Can-I-convert-my-Facebook-Credits-back-to-cash-If-so-how-Are-there-limits

12.11 Appendix 11 - Simulation: implications for commerce and money

Systems of commerce involving pure barter, and the role of money in transactions, have been the subject of intense study for some considerable time (von Mises, 1912; Walras, 1886), and the mixing of money and credit in consideration for a received good or service has also received some attention (Lacker and Schreft, 1996; Dykema, 2003; Evans, 2009). However, there appears to be little or no research as yet on a particular issue of practical concern for capacity trade and credit - namely, in a system that might support payment in a mixture of sovereign money and common tender, what is the consequential effect on overall trade if there were to be a drop in faith in the underlying value of the common tender portion of a transaction?

Consider a commercial system where goods and services could be purchased for a mixture of (i) fiat money and (ii) common tender (such as the approach of the WIR or Ithaca HOURS). Common tender received is credit that can be used as part of future payments within the same system. Assume that the ratio of money to common tender used in purchases is the same for all trades, and is determined by a central body. The following questions arise naturally:

- what happens when traders' faith in common tender drops?
- how does this affect the total value of all conducted trade?
- does loss of faith have any affect at all?
- is there a simple relationship between the two or is the relationship complex?
- does the effect on trade depend on the ratio of money to common tender used in transactions?

To begin to explore these questions, a simulated commercial system consisting of a single exchange that traded a single instrument (which might correspond to a good or service) and eighteen traders was constructed. There were traders comprising six different behavioural types (three intermediaries, three high frequency traders, two fundamental buyers, two fundamental sellers, four small traders and four opportunistic traders).

Simulated trade

Traders observe the limit order book and generate orders according to the coded behaviour of the six different trader types. These behaviours incorporate a degree of verisimilitude and complexity, but are nevertheless simple compared to live trader behaviour.

The limit order book receives two types of orders from traders - limit orders and market orders. Limit orders are expressions of interest to trade a stated volume at a stated (or better) price; expressions of interest to buy are called "Bids", and expressions of interest to sell are called "Offers" (sometimes also known as "Asks"). The limit order book stores these Bids and Offers, grouped according to the stated price for the expression of interest to trade. A Bid expresses an interest to buy at the stated price or any lower price: an Offer expresses an interest to sell at the stated price or any higher price. Normally, the lowest-priced Offer (the Best Offer) states a higher price than the highest-priced Bid (the Best Bid). The difference between the Best Bid and Best Offer prices is known as the "spread". Market orders are requests to buy (known as a "Buy" order) or sell (known as a "Sell" order) immediately at the best available price; an incoming Buy (Sell) is matched against the Best Offer (Best Bid) and a trade is executed. If there are several limit orders at the best price, the market order is usually matched against the limit order that has been on the order

book for the longest time. If the market order is for a smaller amount than the matched limit order, the limit order remains on the book with an adjusted (reduced) volume. If the market order is for a larger amount than the marched limit order, the size of the market order is reduced according to the executed trade and then the revised market order is once again matched against the limit orders on the order book. If the order book receives a Bid (Offer) that overlaps existing Offers (Bids) on the order book, then the limit order book will execute one or more trades as though a market order had just arrived.

The components of an order are therefore its type (Buy, Sell, Bid, or Offer), its price (for Bids and Offers only), and its size (or "volume"). All orders are immortal and there are no order cancellations. All large orders, and all orders from Small traders, are submitted as market orders (i.e. Buys or Sells); otherwise, orders are placed on the book as limit orders (Bids or Offers).

The price of an order is based on various factors: (i) the order type, (ii) the underlying current value of the instrument being traded, (iii) the best bid and best offer prices, (iv) the order size, and (v) the depth of orders near the top of the book. The size of an order is determined according to whether the trader is primarily driven by inventory or profit. For example, fundamental buyers have a constant demand and are driven by the need to fill their inventory requirements. Intermediaries are driven by the need that their inventory should not exceed a certain maximum level. Opportunistic traders are driven by profit.

Behavioural response to reduced faith in common tender

What happens when there is a drop in traders' faith in the underlying value of the common tender received in part payment for goods and services? For the purposes of this simulation, the assumption was that they will modify the prices and sizes of their orders as follows:

- Since the perceived value of common tender has dropped (equivalent to an increase in the cost of trading), traders will require that spreads (the difference between the price paid to buy and the price received when selling) must increase - thus, the prices quoted for Offers will rise. Bids however are unlikely to drop since faith applies to common tender received, not given. In this simulation the drop in faith is applied equally to all traders and therefore this price modification is applied equally to all traders. If faith in common tender is modeled as a percentage then an Offer price might become ((2 - faith)*offerprice) where "offerprice" is the price at which the trader would normally offer to sell, and "faith" is a percentage - thus if there were 100% faith the Offer price would remain "offerprice", but if faith drops to 0% then the trader will want to receive twice the price for the same trade. The choice of "twice as much" is of course an estimation of trader behaviour and is a parameter of the simulation. However, we must also consider that low faith in common tender is only relevant where (and to the extent that) payment is partly in common tender. Thus, the final price modification is:

  $$new\_offerprice = (cashpercentage*offerprice) + ((1-cashpercentage)*(2-faith)*offerprice)$$

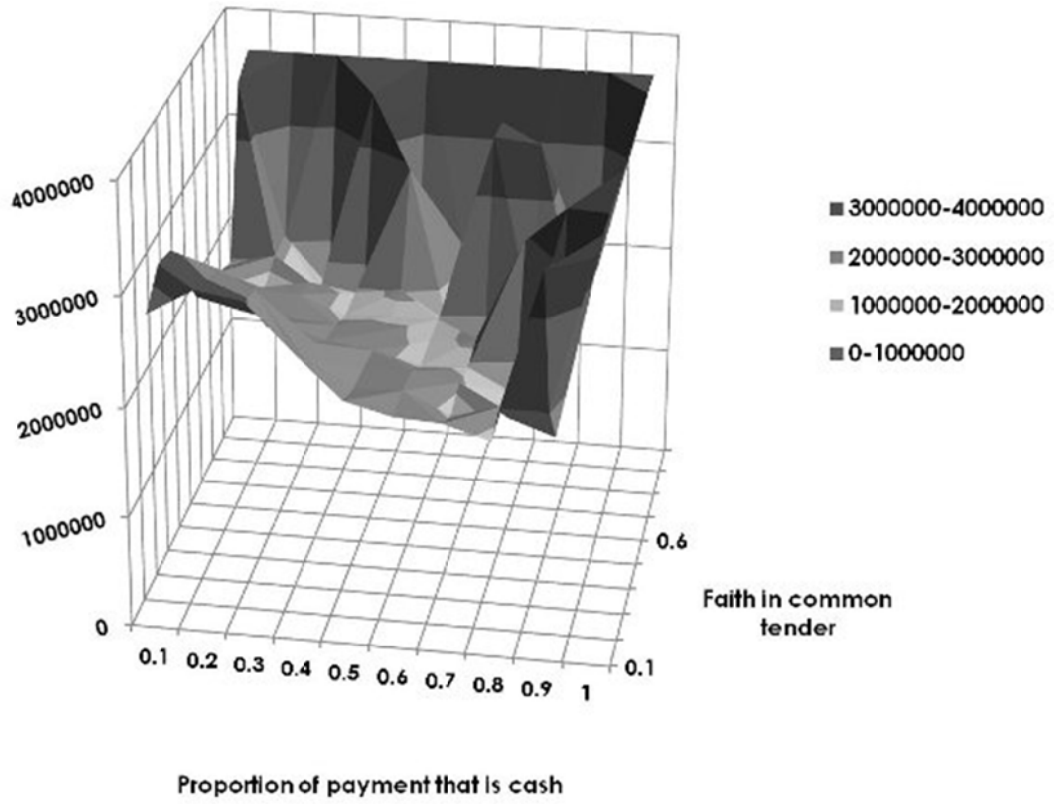
- In the above expression, "cashpercentage" is the percentage of the price paid by the buyer to the seller that is in cash, and (1-cashpercentage) is the percentage of the price paid by the buyer to the seller that is in common tender. The increased cost of trade shown in the above expression will act to depress trade; this is modeled by decreasing the sizes of all orders. However, the amount of decrease in trade size will depend on a trader's profits and thus the modification to trade size is given by the following expression (where "size" is the size at which the trader would normally have traded, "moneyprofit" is the absolute value of a trader's profit that is in cash, and "commontenderprofit" is the absolute value of the same trader's profit that is in common tender):

  *new_size = ((moneyprofit + (commontenderprofit * faith)) / (moneyprofit + commontenderprofit)) * size*

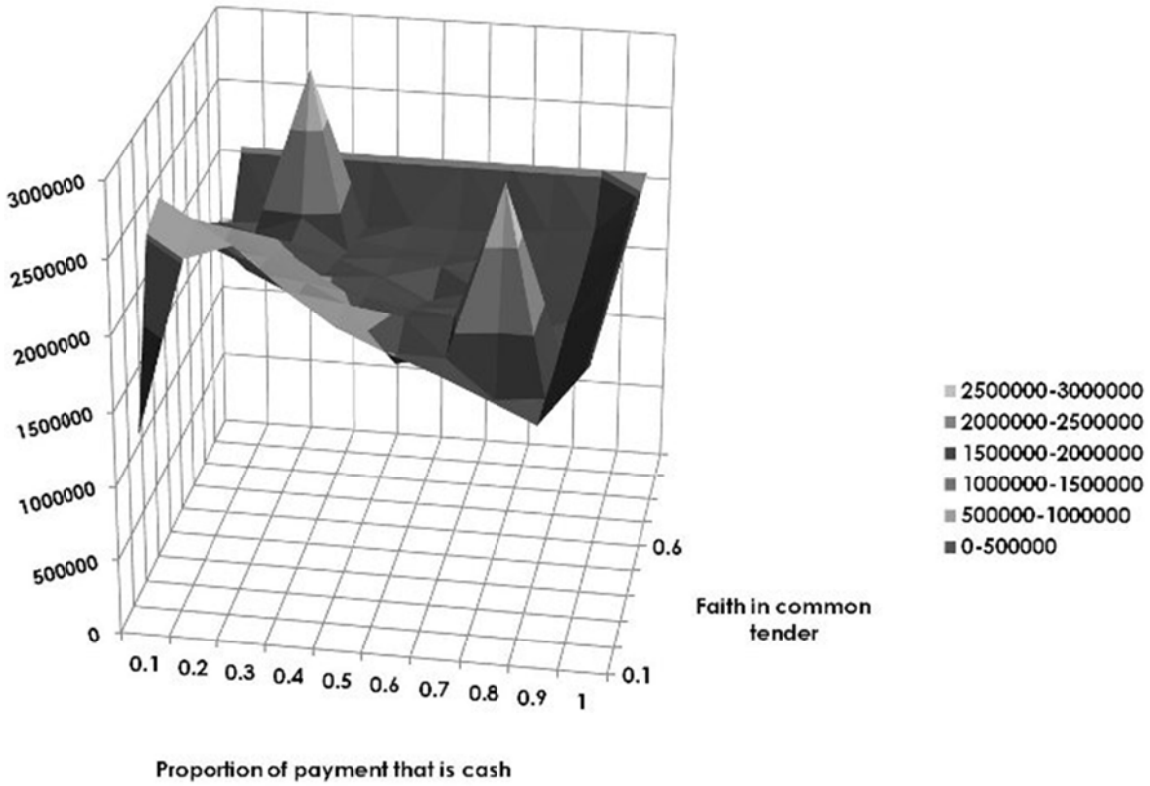
Simulation results

Given the behavioural responses outlined above, how will a drop in faith affect the overall value of trade in the system (assuming that the drop in faith is unjustified and therefore giving full value to common tender)? The simulation ran under two market scenarios: (i) where market value for the traded instrument was static, and (ii) where market value for the traded instrument changed linearly (modelled as a slow downward ramp). The cumulative value of all trades executed within a set period was recorded for differing values of (i) percentage of payment that is cash, and (ii) percentage faith in the value of the received common tender. The results are shown in figures 9.2 and 9.3.

Total trade value (static market)



Total traded value (ramping market)



Discussion

The results for both static and ramping markets are stable at the two limits (100% cash and 100% faith in common tender). However, below the limits the surfaces are, in both cases, unexpectedly complex. In particular, it is not clear why a combination of payment entirely in common tender and very low faith in common tender should lead to a high value of total traded value. Nor is it clear why certain combinations of percentage cash and percentage faith should lead to peaks in total traded value. This simulation leads to the following observations for the simple capacity exchange characterised here:

- Trading with common tender is more complex than trading with sovereign money alone. The simulation illustrates this for the case where traders lose faith in common tender to the same degree. We may expect that more complexity will arise if traders lose faith to differing degrees.
- We don't yet fully understand the causes of such complexity, because they arise from the detailed dynamic interactions between the traders via the exchange. Such interactions are difficult to capture analytically, but can be explored systematically in simulation.
- Loss of faith in common tender can be contagious, leading us to conjecture that a market based on either full or partial payment in common tender may be vulnerable to higher systemic risk than a market that uses only sovereign currency for payments. One might also surmise, however, that greater variety in tender might lead to less systemic vulnerability. Remember that people also lose faith in sovereign currencies.
- The simulation assumes that the traded instrument is fungible and simple. If the instrument were to become more complex it would lose fungibility and pricing would become difficult. Thus, it may become difficult to establish a straightforward market via an order book.
- The simulation assumes that the common tender is simple and fungible. However, as common tender becomes more complex (for example, the common tender may be expressed as an undertaking to provide a specific good or service in the future) then both simplicity and fungibility will be eroded. If fungibility of common tender is reduced, then its acceptability as partial or full payment will be reduced; this will inevitably lead to difficulty in establishing "coincidences of want" (i.e. matching buyers and sellers) to the extent that an order-book market will most likely be replaced with an over-the-counter market.

The simulation is entirely deterministic, and these results should be interpreted to mean that, given certain well-defined trader behaviour, it is ***possible*** to generate the reported total traded values. Many open questions remain. For example:

- Is the observed complexity commonplace, or have the coded behaviours in this initial experiment unwittingly discovered an anomaly in an otherwise straightforward response to changes of faith in common tender?
- What are the detailed behavioural interactions that lead to the observed anomalies in overall traded value?
- If the simulation is extended to encompass multiple instruments (multiple order books), where traders operate across multiple markets, does this lead to more volatility or does it provide stabilisation via diversity? What about multiple common tenders and sovereign currencies?

- What is the effect on overall system stability if the traders were to lose faith in common tender to differing degrees, or in sovereign currency to varying degrees?
- What would be the mechanism of contagion amongst traders in terms of communicating loss of faith in common tender, and how could such systemic risk be modelled?
- Does systemic risk increase linearly in relation to the proportion of common tender used in payment, or is the relationship non-linear?
- In practice, is fungibility a binary concept or can we establish degrees of fungibility? How does this analysis of fungibility affect the running of a market where the loss of fungibility applies to (i) the traded good or service, and (ii) the common tender?

12.12 Appendix 12 – Market imperfections in supply and demand

Much of classical economics was based on a premise that markets are efficient - that Adam Smith's invisible hand can set to work to bring markets into equilibrium. Equilibrium in markets means that the marginal buyer is getting just enough utility from the traded item to justify the price paid and the marginal seller is getting just enough to cover the costs of production.

This belief in self-equilibrating markets, permeated classical economics – Leon Walras's theory of general equilibrium (Walras, 1954) (if there are ***n*** markets and ***n-1*** are in equilibrium then the ***nth*** must also be in equilibrium) is characteristic - and one of its most important conclusions was that involuntary employment is not possible (as in a free market the unemployed would price themselves back into jobs).
Economists have long realised that monopolies could interfere with the efficient operation of markets and the economist Ronald Coase identified further two weaknesses in this structure:

- firms and transaction costs (Coase, 1937) – if markets were efficient then "production could be carried on without any organization [that is, firms] at all" - all operations would be contracted out (an example of this is the Birmingham gun industry in the 1860s where individual production tasks were contracted out to micro-producers (Stigler, 1951). Firms came into existence to avoid the transaction costs imposed by the need to continuously renegotiate and monitor contracts;
- externalities (Coase, 1960) – arise where ownership rights are ill-defined and producers can inflict costs on the general population without paying for them – examples include pollution and over-fishing.

Subsequent developments in macro- and micro-economics have identified numerous other examples of market failure – when the uninterrupted interaction of supply and demand does not lead to efficient outcomes. Monopoly, transaction costs and externalities have already been mentioned but others, which could be addressed by capacity exchanges, include:

- information failure – potential buyers and sellers may never be aware of each other and never meet;
- information asymmetry – organised exchanges help to establish trading histories - eBay ratings is one example;
- regulatory barriers – potential buyers and sellers may be excluded from the market by, for example, rules requiring excessively high entry standards or exchange controls which limit cross-border trading;
- credit restrictions – a buyer may require credit from a third party which is not available even though the buyer is credit-worthy;
- poor enforceability of contracts – or doubts as to which legal code is applicable;
- corruption – may misdirect trade or may make trade difficult or mean that payments are diverted;
- lack of risk management tools – prevent potential traders from hedging volatility.

12.13 Appendix 13 – Airline industry and capacity management

Following the deregulation of airline industry in 1978 in the United States, American Airlines was a pioneer in automated reservation systems. It developed the first on-line reservation system. Later on, American Airlines formed SABRE Group to exploit its SABRE (Semi-Automated Business Research Environment) revenue management software that dealt with reservation activity. In 1985 when American Airlines was threatened on its core routes by the low fare carrier People Express Airlines it implemented a program based on differentiating the leisure and business traveller. Optimizing algorithms determined the right number of seats to protect for full fare paying passengers while still accepting early booking low fare passengers. The result was a resounding success for American Airlines and eventually led to the demise of People Express Airlines in 1987. It is now commonly accepted that revenue management systems have led to lower fares for consumers and higher productivity, measured in passenger loads and revenue, for the airlines, though competition is cut-throat.

Revenue Management (RM) has spread out naturally to other industries such as rental car, retailers, hotels, bandwidth and Internet providers, passenger railways, cruise lines, electric power supply and other industries. Although different in many respects, these industries all share the basic properties of the RM problems namely, perishable products, finite selling horizons, and price sensitive and stochastic demand. These industries also have large fixed costs while variable costs are small in the short run.

Despite the extraordinary success of RM, the underlying models still have to contend with issues of pricing, inventory control, demand forecasting and overbooking. In recent years, with the prevalence of the Internet, online auctions have acquired great popularity in selling perishable excess inventory, and researchers have begun to incorporate auctions in revenue management in different industries. An auction approach significantly outperforms a fixed price approach. In comparing the performance of the fixed price and pure auction approaches in disposing of surplus perishable assets at the last minute, where the number of customers interested in the surplus perishable assets could be significantly higher than the number of assets available for sale, auctions perform better. Just as there is significant 'block trading' in shares where broker agents find each other without information leakage, so might a large capacity exchange may allow airlines to sell surplus inventory anonymously.

Broadly speaking, the auction process should converge to equilibrium in which no agent wishes to change its bid. Of course, the speed of this convergence is important, too. A solution of an auction should be stable, so that no subset of agents could have done better by coming to an agreement outside the auction. Mechanism design theory also suggests that optimal auctions should be incentive compatible; i.e. honest reporting of valuations is a Nash-equilibrium. In sum, the rules governing both the capacity exchange and the auction process itself will dictate the likelihood of success.

12.14 Appendix 14 – The evolution of bucket shops

In the 1970s and 1980s budget travellers were aware of 'bucket shops', i.e. semi-legitimate travel agents who seemed to get excess airline capacity, i.e. cheap tickets. In the late nineties with the expansion and increased use of the Internet, airline companies and their supporting ICT firms, such as the travel technology provider Amadeus, realised that they could bypass agents at comparatively low cost through an Internet travel agency website. This would not only give access to new markets but also help sell inventory for low fare classes and 'last minute' seats. Airlines would no longer depend on their own selling agents and travel agents, who worked on a commission basis and restricted hours, to sell their products. With the success of selling airline seats through the internet it was only a matter of time before Amadeus, which already had access to several low cost airlines' data as well as hotel and car rental data (who could not afford their own central reservation systems), started selling more than flights, e.g. holidays, car rentals and accommodation. Opodo which launched in November 2001 is a pan-European enterprise, founded by a consortium of European airlines, including British Airways, Air France, Alitalia, Iberia, KLM, Lufthansa, Aer Lingus, Austrian Airlines and Finnair. Until recently Amadeus owned 99.4% of Opodo before itself being acquired by AXA Private Equity and Permira Funds. Opodo's turnover has exceeded €1.3 billion in gross sales in recent years.

In 1996, a small division within Microsoft launched an online travel booking site Expedia.com® which gave consumers a revolutionary new way to research and book travel. Three years later, Expedia was spun out of Microsoft, becoming a publicly traded company on NASDAQ under the symbol EXPE. Expedia became and remains the world's leading online travel company. By 2001, it had acquired a number of other travel companies and in 2002 InterActiveCorp (IAC) acquired a controlling interest in Expedia. Expedia grew within IAC, and its synergies with its parent company's other travel holdings became more and more salient. In 2005, IAC spun out its travel businesses under the name Expedia, Inc. Today Expedia, Inc. is the parent company to a global portfolio of leading consumer brands. Expedia's success can also be attributed to its vital relationships with hotel and airline partners and other travel suppliers. Expedia's turnover has exceeded $3.35 billion in gross sales in recent years**.**

12.15 Appendix 15 - Capacity exchanges and competition issues

A capacity exchange would be subject to the normal rules on competition which may be national or European depending on its scale of operation. EU and UK competition policy prohibit two main types of anti-competitive activity: anticompetitive agreements and abuse of dominant market position. Competition policy in Europe is governed by Articles 101 to 106 of the Lisbon Treaty. In the UK the law is contained in the Competition Act 1998 and the Enterprise Act 2002. Agreements which are generally prohibited under Article 101 of the Lisbon Treaty and Chapter I of the Enterprise Act include:

- agreements which directly or indirectly fix purchase or selling prices, or any other trading condition;
- agreements which share markets or sources of supply;
- agreements which apply dissimilar conditions to similar transactions, placing other trading parties at a disadvantage.

It is most important to avoid being regarded as a cartel by the relevant competition authority. Cartels are, effectively, closed user groups of traders which regulate prices between themselves in a manner which is less than transparent. In turn, these may adversely affect the retail and consumer markets. A 'hardcore' cartel is one which involves price-fixing, market sharing, bid rigging or limiting the supply or production of goods or services. The fact that an agreement is restrictive of competition does not mean that it is automatically prohibited; it may fall within exemptions from the competition rules.
The size in membership and of the individual member companies, together with their combined market share, will have a bearing on how a capacity exchange is regarded by the relevant competition authorities. If it has a dominant position or a particularly large market share locally, nationally or across Europe, its activities will be scrutinised carefully to determine if its activities are deemed to be anti-competitive. There may also be issues of market distortion if goods or services are exchanged between members at less than the market rate, allowing members to resell them at a price which undercuts competitors.

In the United States, the basic anti-trust law remains the Sherman Act of 1890 which prohibits "(e)very contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce" (15 U.S.C. paragraph 1). Conduct only falls within the scope of this prohibition if some form of agreement or concerted action can be proved. In respect of restraint of trade the Supreme Court has opined that "[t]he true test of legality is whether the restraint imposed is such as merely regulates and perhaps thereby promotes competition or whether it is such as may suppress or even destroy competition" (Board of Trade of the City of Chicago v. United States, 246 US231, 222(1918) ("Chicago Board of Trade").

There is a possibility that a capacity exchange could be regarded as a cartel or as a group of companies which 'fix' prices on surplus capacity. This is easily avoided if members of the exchange are exchanging goods and services which are surplus to requirements on exchange for those being offered by other members; and also if the exchange is set up not as a 'closed shop' but open to all who wish to participate.

12.16 Appendix 16 - Electronic commerce

Electronic commerce (or e-commerce) at its simplest refers to the buying and selling of goods and services over electronic networks such as the internet. More widely, it includes the entire online process of developing, marketing, selling delivering, servicing and paying for them. It has also benefitted from developments in electronic funds transfer (EFT), electronic data exchange (EDI), inventory management systems and automated data collection systems. Electronic commerce which takes place solely between businesses is referred to as B2B; between businesses and government as B2G; and between businesses and consumers as B2C.

Both the UK and the EU are very keen to promote e-commerce and have been doing so since 2000 when European and American businesses began offering their services through the World Wide Web (www). Much public procurement is now undertaken electronically as are a wide variety of transactions such as those over stock exchanges across the world. Companies and individuals rely on being able to transact electronically.

Despite this governmental push across Europe, take-up remains lower than desired for many reasons. One reason is concern regarding the authenticity of the purchaser and seller. This has been and is being addressed though legislation and policy statements on electronic (or digital) signatures.

A digital signature or digital signature scheme is a mathematical scheme for demonstrating the authenticity of a digital message or document. A valid digital signature gives a recipient reason to believe that the message was created by a known sender, and that it was not altered in transit. Digital signatures are commonly used for software distribution, financial transactions, and in other cases where it is important to detect forgery or tampering.

They allow business to sign documents and carry out business transactions electronically through the provision of the assurance that the authors and signatories of documents are who they claim to be. The use of digital, or electronic, signatures has a number of advantages:

- information arrives instantaneously, regardless of distance;
- once set up the cost of sending each item is virtually nothing;
- information can move directly from company to company without any persons being involved;
- information normally arrives uncorrupted, or there is a warning and retransmission follows easily;
- when used properly it is impossible for someone to copy the signature which applies to the whole document (not just the last page where it is signed);
- the data sent can be relied on as not having been changed or maliciously altered;
- the message is time stamped giving proof of its transmission;
- in a contractual dispute the sender cannot deny knowledge of the message which has been sent which provides proof against repudiation;
- there are no re-keying errors which results in correct deliveries and fewer payment disputes.

In Europe the legal position is governed by Directive 1999/93/EC on a Community framework for electronic signatures. A subsequent Action Plan aimed at assisting Member States in implementing mutually recognised and interoperable electronic signatures and e-identification solutions in respect of public services was agreed in 2008 (COM(2008) 798 final.

Under the Electronic Signatures Act 2000 electronic signatures are admissible in evidence about the authenticity of a communication or data in the UK. Similar legislation is in place in the USA (the US ESIGN Act of 2000) and many other countries.

12.17 Appendix 17 - Local Exchange Trading Systems

Local Exchange Trading Systems (LETS) are community-based, not-for-profit networks where members can trade goods and services through a centralised exchange and using a local currency. Michael Linton is credited with developing LETS in Canada in 1983. LETS are designed to complement the existing market economy as opposed to offering an alternative system. The principal behind LETS is socio-economic: they are designed to offer economic opportunities to unemployed or poorer members of society and at the same time to foster trust and strengthen community relationships. By using a local currency which is issued by the members themselves – through the goods and services they offer on the exchange – LETS attempt to create a monetary system that keeps wealth within the community and that exists in sufficient supply to meet the needs of that community (Linton and Soutar, 1994).

Personal money and the market economy

In LETS the unit of measure is convertible to or has the same value as the national currency. "A brief look at the nature of LETSystem currency will show that it is a totally different kind of money from the national currency. Equivalence only means that the value or measure of the two units is the same" (Linton and Soutar, 1994). LETS do not claim to be independent of the mainstream monetary economy and, in fact, "are structurally dependent on the market economy by virtue of their assumption of the national currency as a unit-of-account" (Peacock, 2006). They are intended to be complementary, not wholesale alternatives to, the wider economy.

As with traditional barter systems, LETS appear to flourish in times of economic hardship. An article in the Sunday Times (January 2009) asserted that, in the UK, "as many as 40,000 people belong to Lets (sic) and more are joining all the time" (Flintoff, 2009). Figures from the early days of LETS indicate that between 1991 and 1993 the number of systems in the UK increased from seven to 150, while 70 had been established in New Zealand and 200 in Australia. Today, a website that exists to provide links between LETS communities around the world suggests that there are presently over 1,500 such exchanges in 39 countries.[88]

Examples of LETS include the Talente system in Innsbruck, which has a membership of 120 (Schraven, 2000) and the Brixton Pound in the UK[89], which counts 70 businesses as members.

Community and socio-economic benefits

Community, one of the fundamental LETS concepts, is defined as "a group which relates to itself. In any true community we have a sense of being there for each other and we act in a mutually supportive way… Any self-regarding community can therefore be supported by a LETSystem" (Linton and Soutar, 1994). The incentive to be a part of a LETS group is based as much on social as on economic principles and a desire to foster a sense of community.

Taxation and LETS

According to the Decision Makers Guide issued by the Department for Work and Pension (DWP), credits earned by members on a LETS count as taxable income for

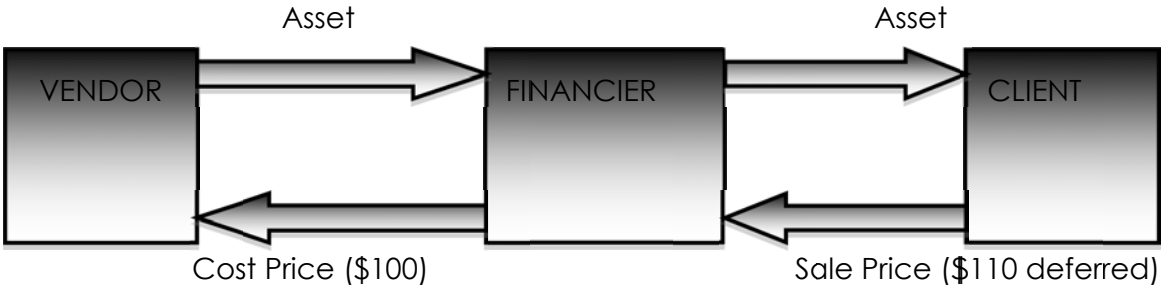
[88] http://www.lets-linkup.com/default.htm
[89] http://brixtonpound.org/about/keyfacts/

Income Tax purposes. The guidelines state that the value of such credits should be determined either by the established exchange rate between the credits and Pounds Sterling, or on a case by case basis using indicators including the purchasing power of the credit within the exchange or the average local rate of pay for the type of work carried out (Department of Work and Pensions, 2011). Anyone who is in employment and who earns credit through a LETS is also liable to make National Insurance Contributions on those earnings (HMRC, n.d.). The same criteria are used to determine the value of the wages earned.

12.18 Appendix 18 – Murabaha finance[90]

A 'murabaha' contract involves the trading of an asset between two parties where the seller of the asset discloses to the buyer the original cost price of the asset. A murabaha contract is usually referred to as a cost plus contract as the seller usually adds a mark up to the sales price. The transfer of the asset must be immediate although the payment by the buyer is usually deferred and thus introduces an element of credit provision into the contracts. It is a very popular form of Islamic short- and medium- term financing.

In Islamic finance, participant must avoid 'riba' or interest. Riba is profit from extra earning obtained free of exchange. The extension of credit may include a mark up to the price to compensate for denying the seller the use of the asset and for allowing the buyer the use of the asset before it has been paid for. The price may also include elements such as administrative costs, compensation for credit risk and any profit mark up. There should not, however, be any time-related payment as this would be considered riba.



Although the sale contract was not originally used as a method of providing finance, murabaha arrangements are perhaps the most widely used Islamic financing technique at the moment (see above). The introduction of deferred payment terms involves the provision of credit, and the profit mark-up of the seller is often benchmarked against a conventional index such as Libor, thus creating a contract very similar in its effect to a conventional loan.

Commodity Murabaha is normally used to affect a loan between financial institutions, and can be used to create the Sharia equivalent of an inter-bank deposit between conventional banks. There are a number of minor variations on the structure but the basic structure is set out below.

Sharia compliant Bank A wishes to place a deposit with Bank B. Bank A purchases commodities from a supplier but does not take delivery of them. Bank B acting as agent for Bank A (without charge) takes the title to the commodities and then sells the commodities immediately to Bank A at a cost plus profit, allowing Bank A to defer payment either over a set period or at a specified future date. In this process, Bank B takes title to the commodities but not delivery. Bank B then immediately sells the commodities at a cost, equivalent to the cost, to an end-purchaser. All this is done simultaneously to avoid the risk of either a rise or fall in the commodity price. The proceeds equivalent to cost of the commodities (i.e. the "deposit") is credited in Bank B's account allows for subsequent use. The profit on sale of the commodity by Bank A to Bank B is Bank B's profit on the transaction, and as stated above is often

[90] This appendix was written in association with Brandon Davies, Gatehouse Bank.

related to a conventional index such as Libor.

In practice commodity murabaha are often used by Islamic banks to facilitate their inter-bank deposit taking and general liquidity management activities. The underlying commodity contract is frequently a metal, such as copper or aluminium, as traded on the London Metal Exchange (LME).

These transactions have caused debate in the industry, not least, because in many of the transactions no commodities actually change ownership. Moreover it can be argued there is an element of pre-determined return and artificial construct in these transactions and that they may be used to fund activities that are not Sharia compliant as the deposit taking bank may not be Sharia compliant.

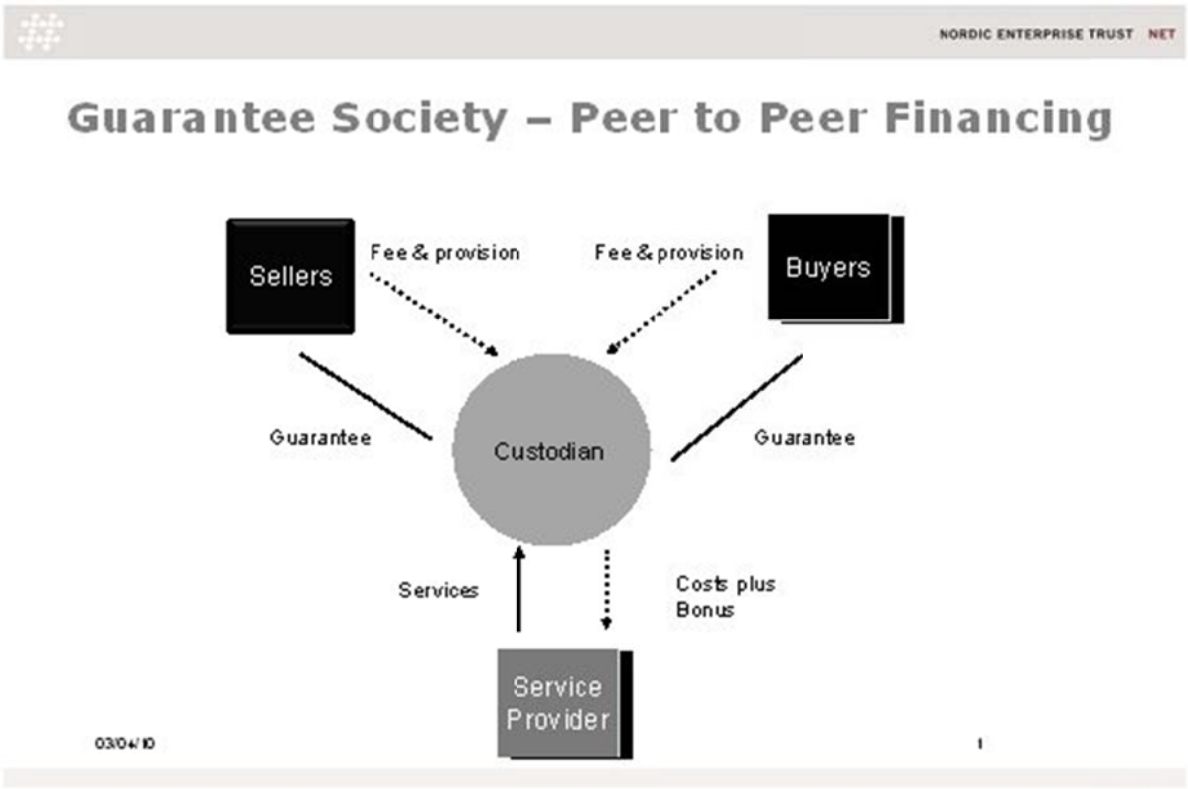
Proponents argue that as a product it is 100% sharia compliant under the concept of Tawarruq Bi-ghairi Munazzam and is unanimously accepted by all Sharia schools of law. Even the Accounting and Auditing Organisation for Islamic Financial Institutions (AAOIFI) says commodity murabaha is not invalid. Whether it is ideal or not is irrelevant as it is Sharia compliant. Its close resemblance to conventional financial instruments is also irrelevant.

A significant financing opportunity exists for multilateral capacity exchanges that can provide access to sharia compliant credit markets. This might take the form of structured tranches of funding for exchange of sharia compliant products and services for specific time periods in the exchange network.

12.19 Appendix 19 - Money 3.0[91]

Money 3.0 suggests new frameworks for the creation and exchange of value enable Transition through 'Peer to Peer' financing, and resolution through 'Peer to Asset' funding.

Guarantee Society



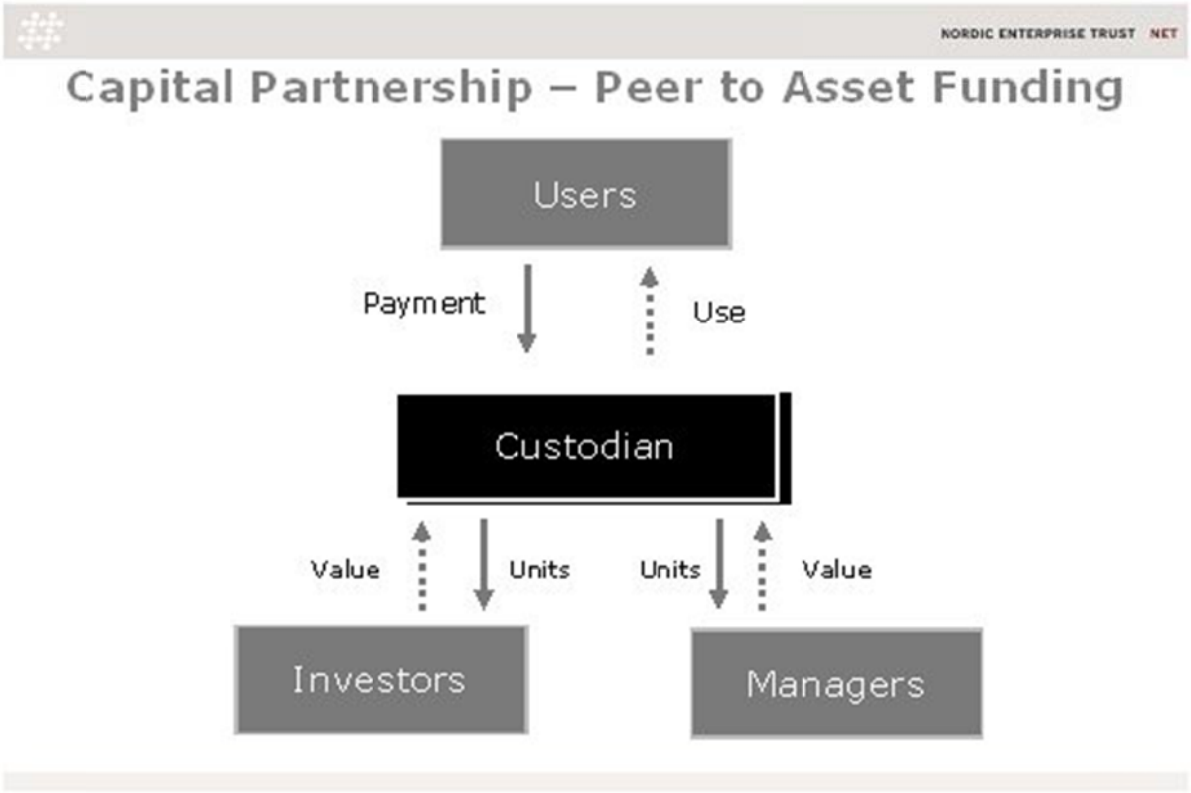
In this 'credit clearing' model, banks become credit service providers who set guarantee limits; manage clearing and settlement; and handle defaults. A service fee or subscription is collected from seller and buyer to cover agreed costs, and a guarantee charge/provision is levied on both buyer and seller in respect of credit and debit balances.

In addition to receiving agreed costs, banks as credit service providers also receive a performance based reward. Any surplus would be distributed as a dividend so that members who contribute to but do not use the guarantee are compensated, in proportion to use, by users of the guarantee.

Such a mutualised approach to risk is not new: for over 130 years shipping and related risks have been mutually insured by P&I Clubs, and for 125 years have been managed by the same service provider.

[91] This appendix was written in association with Chris Cooke, Nordic Enterprise Trust.

Capital Partnership



Productive assets held by a custodian are operated and funded through the issue of Units redeemable in payment for use of the productive value from the asset. Units redeemable in payment for land rental value will enable the resolution of unsustainable debt funding, while units redeemable in payment for energy value will enable the transition to a low carbon economy.

Money 3.0 and the Energy Standard

The Guarantee Society and Capital Partnership are not 'organisations': they do not own anything, do anything, employ anyone or contract with anyone. They are simply consensual framework agreements for individuals and enterprises to self-organise to a common purpose.

Economy 3.0 requires a Unit of Account by reference to which prices may be judged and transactions agreed. This could be an absolute Unit of energy, for example the energy equivalent of 10 Kilo Watt Hours.

Domestic currency units based upon land rental value and international currency units based upon energy value will be priced against this energy unit of account. Transactions will take place within a framework of trust ultimately based upon the infinite value created by human intellect individually and collectively.

Money 3.0 is then the relationship within which value is exchanged by reference to an Energy Standard

13 Figures, tables and boxes (sections 2 to 12)

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14 Glossary

Business-to-business (B2B)
Transactions between businesses.

Business-to-consumer B2C
Transactions between businesses and consumers.

Barter
The direct exchange at one point in time of goods and/or services for other goods and/or services. Barter required double-coincidence of wants. The value of the goods and services exchanged is agreed between the two counterparties.

Capacity Exchange
A membership-based system within which companies can trade available capacity in the form of goods, services and infrastructure within and across industries, using common tender as a medium of exchange.

Central counterparty
An entity that interposes itself between the counterparties to trades, acting as the buyer to every seller and the seller to every buyer.

Common tender
Money commonly accepted as payment of debt without coercion of legal means.

Corporate barter
A three stage transaction process where:
1. A company exchanges unsold or otherwise excess inventory for 'trade credits' on a corporate barter platform through a third party broker.
2. The same broker purchases media or advertising capacity from another source.
3. The company uses a combination of 'trade credits' and cash as payment to the broker for the media or advertising capacity.

Counterparty
A party to a contract.

Countertrade
Cross-border commercial transactions in which provisions are made, in one or a series of related contracts, for payment by delivery of goods and/or services in addition to, or in place of, financial settlement.

Digital money
A form of electronic money that can be used to pay for goods and services, most often on the internet or another electronic medium.

E-commerce
Commercial transactions occurring over open networks, such as the Internet.

Electronic money
Electronic money is defined as monetary value as represented by a claim on the issuer which is: (i) stored on an electronic device; (ii) issued on receipt of funds of an

amount not less in value than the monetary value issued; (iii) accepted as means of payment by undertakings other than the issuer.

Liquidity
In terms of markets, liquidity generally refers to the ability to buy and sell assets quickly and in large volume without substantially affecting the asset's price. In terms of instruments, liquidity generally refers to those assets that can be converted into cash quickly without a significant loss in value.

Local exchange trading systems
LETS are community-based, not-for-profit networks where members can trade goods and services through a centralised exchange and using a local currency.

Modern and organised forms of barter
A form of multilateral reciprocal trade whereby three or more parties trade capacity with each other using a mean of exchange backed by the goods and services traded.

Multilateral reciprocal trade
Trade between three or more participants facilitated by a means of exchange which is backed by the goods and services of the participants and is not convertible to cash.

Output gap
An output gap refers to the difference between actual and potential gross domestic product (GDP) as a per cent of potential GDP.

Peer-to-Peer (P2P)
A communication structure in which individuals interact directly, without going through a centralised system or hierarchy.

Retail barter
B2B trade between companies (typically SMEs) within a membership system where goods and services are exchanged using a system of mutual credit based on a common tender such as trade pounds, trade dollars or trade credits.

SMEs
Small and medium sized enterprises.

Sovereign currency
Currency issued by a sovereign government.

Trade credit
A type of common tender issued by a retail barter or corporate barter platform and used as the means of exchange for goods and services between member organisations.

Working Capital
A broader view of a firm's capital needs that includes both current assets and other non fixed asset investments related to its operations.

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