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Transaction Management: Value Creation by Reducing Transaction Costs

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Tinbergen Institute Discussion Paper

Transaction Management: Value Creation by Reducing Transaction Costs

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Tinbergen Institute

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Transaction management: value creation by reducing transaction costs

Frank A.G. den Butter¹

Abstract

In this era of globalization we see an increase in specialization: the production chain is split up in more and more parts and the production of these parts is outsourced to those places in the world where production is relatively cheapest and most efficient. It implies that transaction costs, associated with the coordination of production and trade in parts and components, become increasingly important. In small open service oriented economies like the Netherlands, transaction costs may amount to up to 50% of total value added. Therefore, the ability and skill to keep transaction costs low is vital for the competitive position of a firm or country. This is what transaction management is about: create value from these transactions by keeping transaction costs as low as possible. Transaction management is based on modern theories of transaction costs economics, institutional economics, industrial organization and international trade. It makes these theories operational for strategic decision making in industry and government. This chapter surveys how transaction management as a practical tool for the organization of production has been inspired by these modern economic theories.

Keywords: transaction costs, outsourcing, trade in tasks, fragmentation of production, make or buy decision, game of trust.

JEL-codes: D23, F2, F43, L23

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1. Introduction

In this era of globalization and computerization the division of labour and specialization in production and services are the main sources of economic prosperity. Specialization uses economies of scale, and skills and tools of others so that total production costs become lower, or that the quality of the product or service is improved. This was already true in the time that Adam Smith wrote about the gains from specialisation in his "Wealth of Nations", but it is much more true in these modern times where production chains are split up further and further so that the fragmentation of production increases. In contrast to a producer who makes all parts and components of the product him- or herself, specialisation in manufacturing of parts and components and in services has become standard. Nowadays there are numerous examples of the outsourcing of tasks, especially outside the core business of the organization (such as catering or maintenance in an office building, or the outsourcing of administrative work). Instead of executing all tasks him- or herself, the producer of a final product or service has become the orchestrator who successfully connects the individual links of the production chain to each other. The focus now has come to lie in the orchestrating function which aims to exploit all advantages of specialization and fragmentation of the production as good as possible. This development is especially relevant for open economies with a tradition as a trading nation, like the Netherlands. Such nations can be characterized as *transaction economies* (or orchestrating economies). Transaction economies focus more and more on the organization of production and on creating value in coordinating the supply chain.

This chapter takes transaction costs as a guiding principle. Apart from comparative advantages in production, transaction costs are the main determinant of (international) trade flows. Similarly, differences in transaction costs are crucial for the location and investment decisions of firms on where to produce, and on where to organize and orchestrate production in their headquarters. So knowledge on transaction costs, and on how to manage these transactions, is vital for these trade and investment decisions. Therefore, efficient *transaction management* which reduces transaction costs, will make existing trade more profitable and will lead to more trade. It strengthens the competitive position of individual firms, and, through spill-over effects, of the whole nation so that it enhances welfare. In this way a reduction of transaction costs creates value for firms and society. The conundrum is that with lower transaction costs total transactions will rise more than proportionally, so that transaction costs will take a larger share of total costs. It enhances the importance and profitability of transaction management. Hence, shortly stated, ***transaction management is the ability to keep the costs of trade transactions as low as possible so that the value creation from these transactions is optimized.***

The more knowledge we have on these aspects, which is partly tacit knowledge, the better we can strengthen our position of managing transactions. In the world of globalisation and global (out)sourcing it is vital for companies to preserve the orchestrating function in the production, and in the demand and supply networks. Major questions in this respect are: where and how can we buy ideas for new products and services, how do we obtain knowledge on making these products and providing these services, where do we find labour, and where and how can we continue and improve selling these products and services at the highest margin? Financing and risk

management are an important part of that management function. It is this new role for the professional traders, which is another focus of transaction management.

The contents of the chapter is as follows. The underlying argument of transaction management is that much of the wealth in the world comes from specialization and division of labour. That is what makes the fragmentation of production of today pay off and that is why the focus of value creation increasingly lies in the efficiency of coordination. This is discussed in section 2.

Section 3 argues that the globalizing world with more and more specialization and an extended division of labour brings about more transactions. Transaction economies should focus continuously on reducing the transaction costs. The economic theory of transaction costs teaches us which types of transaction costs are involved and how transaction costs affect the working of the economy. It appears that transaction management can be, and is to be, applied to a much broader range of 'transactions' than one is initially inclined to think.

A fundamental problem of exchange, that brings about transaction costs, is that most trade transactions are characterized by a difference of timing -being sequential- between the moment of agreement on the transaction and the moment of delivery. A solution to this fundamental problem of exchange is institutionalizing the game of trust. Section 4 extensively discusses this aspect of transaction management.

Thanks to the reduction of transaction costs through good transaction management more parts of the production can be outsourced to suppliers, subcontractors or specialised plants of companies. Sometimes outsourcing is in the home country, but more often it is outsourcing abroad. It implies that outsourcing and offshoring become important strategic decision tools in the transaction management of businesses. As mentioned before, it transforms the internationally operating firms in the home country from a on manufacturing oriented industry to one based on orchestration and transaction management. This transition is very much what we observe in reality in the globalizing world. It is discussed in section 5. Characteristic for this is to let others perform various tasks in the production chain, sometimes within another developed economy but more so in major emerging economies, including the BRIC's, where, for the time being, wages are low.

Finally section 6 summarizes the findings by reviewing the characteristics of transaction management.

2. Specialisation and coordination

Comparative advantages

Most developed countries, especially when they can be characterized as open economies, with a high amount of trade, witness a decline in employment in agriculture and industry, while employment in trade and services shows an increasing trend. This trend has to do with the increasing *division of labour and specialization*, both within national economies and in the world as a whole. Specialization means exploitation of economies of scale and using the diversification of skills and availability of resources in the production of goods and services. Production takes place there, where it is

relatively the cheapest. Availability in a country of raw materials and of capital, both physical capital and human capital, determines what is produced and what is traded. These are the *comparative advantages* of a country in international trade. Traditional trade theory explains the goods and service trade flows from such comparative advantages. A country with rich natural resources has a competitive advantage in that respect and will be able to sell these resources, whether or not processed, profitably in world markets. The same applies to a country where labour is relatively cheap, because of low wages, or to be more precise, where the productivity of labour is high relative to wages. Then exports of labour intensive products and services are relatively profitable.

Yet these differences in available resources between countries - labour, capital and raw materials - only partially explain international trade. When all comparative advantages were fully exploited, world trade flows would be far greater than they actually are (see e.g. Treffer, 1995). The explanatory power of this type of comparative advantages appears limited in a modern economy. In international trade, and especially in those countries where trade and transactions are a driving force in the economy, other aspects play a more important role. Here it is essential to realize that trade is not for free, but brings about all sorts of costs. Indeed, the division of labour and specialization on the one hand has the effect that the production of goods and services becomes more efficient. This holds true both for the division of labour and for specialization within firms, and between firms and countries. On the other hand, division of labour and specialization also imply that the various activities are to be coordinated. All costs of this coordination can, in a broad sense, be regarded as *transaction costs* (see the next section). In case of coordination between firms through the market, these (business) transactions imply a transfer of property rights. In this case of market transactions, we have horizontal transaction costs. But in a modern economy a large amount of transactions takes place within companies. Part of it is intracompany trade, where sometimes market mechanisms for making the transactions cost efficient are simulated – a form of transaction management - , but also a lot of transactions occur within the hierarchy of the firm. Here we have vertical transaction costs. A part of transaction costs of firms in a modern society is also related to the labour market, such as search costs, hiring costs, firing costs and the costs of building up firm specific human capital.

The balancing of on the one hand efficiency gains and on the other hand of transaction costs due to specialization leads to an addition to the traditional Edgeworth box diagram, which provides a stylized illustration of the welfare gains of exchange (see Box 1).

Box 1 Exchange and transaction management according to the Edgeworth box

Economic textbooks illustrate the way in which exchange brings about an increase in welfare using the so-called Edgeworth box. This box of Figure 1 distinguishes two different goods (X and Y) and two different persons (or firms) (A and B). The box shows which exchange possibilities A and B have in the case of an initial distribution (endowment) of goods X and Y. For person A the origin is OA and for person B OB. In the origin OA the initial endowment is that person A owes nothing whereas person B owes the total available amount of goods X and Y. In origin OB person A owes everything and person B nothing. From OA the indifference curves UAI, UAII and UAIII indicate which combinations of X and Y yield the same amount of utility (welfare) for A. The further the indifference curves are located from the origin, the higher the utility (welfare) for A. For person B the mirror image holds true from origin OB with indifference curves UBI, UBII and UBIII. The further UB is away from the

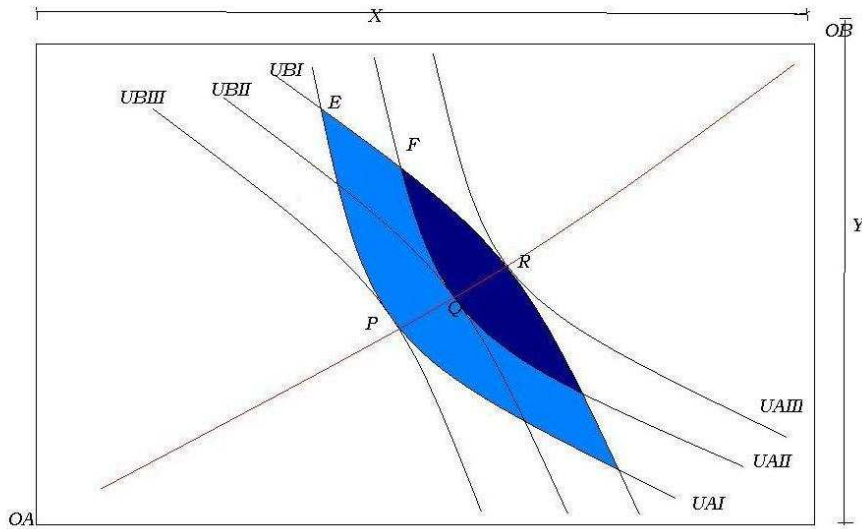
origin OB, the higher is the utility and welfare for person B.

Now suppose that point F represents the initial distribution of X and Y. It means that A owes a lot more of good Y than B and B has initially about the same amount of good X than A. Note that the total amount of goods X and Y determines the size of the box. The figure shows that the initial endowment in point F allows for a welfare improvement of both persons – or at least not a reduction of welfare for one of the persons – when exchange takes place so that the distribution of goods X and Y moves to the area between the indifference curves U_{A1} and U_{B1} . This is a *Pareto improvement* where an exchange increases total wealth in such a way that none of the persons loses wealth. The actual amount of exchange of goods X and Y, and hence their relative prices, will depend on the bargaining power of both persons. Ultimately that determines which point on the contract curve QR is reached. If the initial endowment were more unequal in the sense that one person has more of X and the other more of Y (point E in the figure), then the potential for exchange to be welfare enhancing becomes larger. Now the area between U_{A1} and U_{B1} offers the possibility for a Pareto-improvement. The final outcome of an efficient exchange contract is now on the PR curve. The intuition is that specialization, where A produces one good and B the other good, represents a situation where there will be more exchange and hence the welfare effects of that exchange will be higher than in a situation where both persons are producers of both goods. It should be noted that such a Pareto-improvement does not bring about a redistribution of welfare and that the government should not interfere with the exchange for that reason. It only brings about more welfare, and the relative bargaining power solves the distribution problem (which is different from the redistribution problem)

In the traditional description of barter exchange, the Edgeworth box assumes that exchange is for free and that the negotiation about the exchange between the two parties does not affect their production possibilities or endowment (the total amount of X and Y is equal for any exchange). In other words: in the Edgeworth box there are no transaction costs.

The question now arises how the existence of efficiency gains due to specialization, but also the transaction costs that the exchange will bring about, can be included in this simple economic analysis of barter. Efficiency gains because of economies of scale in specialization mean that A will be able to produce more of the good where he/she has comparative advantages and B more of the other good. So in total more of X and Y becomes available. It means that specialization makes the surface of the box is bigger. On the other hand, increased specialization means that there will be more exchange and that therefore the transaction costs increase. The time and effort that A and B have to spend on the exchange, and the consequent transaction costs, will result that less X and Y can be produced. Therefore the surface of the box becomes smaller. It is of importance to the welfare gain specialization yields that the increase of the surface of the box because the efficiency gain outweighs the decrease due to higher transaction costs. It is exactly what good transaction management should do: keep transaction costs low so that the opportunities to benefit from specialization can be exploited as much as possible. Moreover, keeping transaction costs low will also reduce as much as possible the distortion in the allocation of goods and services that transaction costs bring about. For that reason a role of the government is to facilitate good transaction management (e.g. through a good system of legal protection of property rights).

Figure 1 Edgeworth box



The trend of a continuous increase in the division of labour and in specialization is not that of today or tomorrow. As mentioned in the introduction, Adam Smith already noted in his famous pin factory example how the division of tasks greatly increases productivity. This increase in productivity eventually translates into higher wages, and thus into more purchasing power. It is evident that wealth, measured by material wealth, has in the past century increased significantly, mainly because of productivity improvements which were the result of labour division and specialization.

Obviously transaction costs, or to be more precise, the ability to reduce transaction costs, have much contributed to these developments. The upshot here is that transaction costs can be too high so that no (business) transactions take place. In that case, the benefits of division of labour and of specialization are not sufficient to outweigh the disadvantages, i.e. the coordination costs which specialisation brings about. In that case a reduction of transaction costs may imply that further specialization is profitable and that therefore the amount of exchange (trade) increases (see Box 1). It also means that existing trade becomes cheaper. In both cases, the reduction in transaction costs increases *welfare*. In the context of the debate on globalization it is an important question who receives most of the benefits of the welfare increase. So solving part of the coordination problem evokes a distribution problem of welfare. From the perspective of the national interest it seems desirable that the benefit of the reduction of the transaction costs accrues to the home country. In the long run equilibrium situation with well functioning markets eventually the domestic consumer will benefit. However, from the perspective of international solidarity it may be desirable for others to profit from the welfare gain as well, preferably to alleviate poverty in the world. In that sense good transaction management does not only improve prosperity at home, but it can also contribute to the welfare gains in the poor regions of the world. It should be mentioned, however, that there are still some snags to resolve with respect to the global distribution problem of exploiting increased trade opportunities, such as the cumbersome negotiations in the WTO (Doha Round) show.

Fragmentation of production

The trend of ongoing global specialization and of division of labour has the effect that production chains are more and more split up in various parts. The result is an increasing *fragmentation of production*. Those parts of the chain, which can be produced elsewhere at a lower price, become outsourced. In fact, this fragmentation of the production has so drastically changed the nature of trade that a different approach to trade theory is needed. No longer do comparative advantages in the production of goods and services explain trade flows. Instead comparative advantages in performing tasks are the dominant determinant of international trade flows. It is a *trade in tasks* as Grossman and Rossi-Hansberg (2006, 2008) argue. This is further discussed in the next section.

The fragmentation of production takes place both nationally and globally. At the national level there is an increasing use of specialist subcontractors and suppliers. The number of self-employed without personnel (SWP'ers) has significantly increased in the recent period. At the global level the fragmentation of production and the ongoing specialization is a major characteristic of the process of globalization. Thanks to a steady reduction of transaction costs it has become increasingly attractive to produce or buy components of products abroad. Outsourcing and the establishment of foreign branches (in the statistics recorded as foreign direct investment) are its visible effects. Here the strategic decisions whether to 'make or buy', and where to locate the production – the location decision – are made through a comparison of the lower production costs with the higher transaction costs. Globalization and the increasing share of the transaction costs in total costs make it possible for an individual firm, but also for a country as a whole, not only to specialize in the field of production, but also in the field of fostering transactions and the coordination that is needed for these transactions to become and remain profitable. The latter is what happens in a transaction economy, assuming that such a transaction economy has a comparative advantage in conducting profitable transactions. In other words: a comparative advantage as a trading nation. It is a good and innovative *transaction management*, i.e. always finding new ways to create value in transactions, that is needed to safeguard the comparative advantage in this field. This "specialization" to a transaction-economy (or orchestrating economy), implies that other countries, because of their specific comparative advantages, such as availability of raw materials, cheap labour and/or specific technical knowledge, will specialize in certain types of production, or assembly. (see e.g. Den Butter and Hayat, 2008)

3. Transaction costs economics

Categorization of transaction costs

The previous sections discuss the crucial importance of transaction costs in a world with increasing specialization and division of labour. The question now is how transaction costs can be defined and what types of transaction costs can be distinguished and categorized. Fragmentation of production, where the production chains of goods and services are split into a growing number of links, can be seen as a feature of specialization in the globalizing world. The economic theory of industrial organization partly explains how and to what extent this happens. Formerly this theory was called the theory of 'external organization'. In an industrial organization with

fragmented production it is, from the analytical perspective, essential to distinguish between production costs and transaction costs. Production costs can be defined as all costs which are made within the links of the production chain, including development costs. So, loosely speaking, transaction costs are all other costs which relate to coordinating and connecting the various links of the production chain.

From that perspective *transaction cost* can be defined as *the costs which are made in order to coordinate and connect all links in the production chain*. Hence a considerable part of transaction costs are in fact coordination costs. Transaction costs relate to both coordination and transfer costs within firms where coordination takes place through the hierarchy (vertical transaction costs), and to costs of outsourcing and trade between firms where coordination takes place via the market mechanism (horizontal transaction costs). As mentioned before, sometimes pseudo-market mechanisms (e.g. through competitive transfer prices) are introduced within a firm in order to keep these costs low and to promote internal efficiency. Thus, *transaction costs* can also be defined as *all costs of trade transactions in a broad sense*. Often, these costs relate to the "hassle" associated with the buying and selling of goods and services and with the relocation of production. A firm that has the ability to create a more attractive market situation for its product by reducing the costs of trade, can be internationally successful, as this type of costs is important in international trade.

In the case of 'real' trade through market transactions with horizontal transaction costs there is a transfer of property rights. In such a situation of market trade, transaction costs relate to finding a suitable trading partner, negotiating, setting up and signing a contract, monitoring compliance with the contract and imposing fines if the agreements are violated. Transaction costs are partly caused by formal trade barriers such as import tariffs, but an important part of these costs stem from informal barriers arising from differences in language and culture, ignorance and lack of trust. This marks the distinction between 'hard' and 'soft' transaction costs. The *hard transaction costs* include observable costs such as transport costs, import duties and customs tariffs. The *soft transaction costs* comprise all costs of making and monitoring contracts, information costs, costs due to cultural differences and miscommunication, unwritten laws, trust building, networking, risk costs, costs due to safety regulations and provisions, etc. These soft transaction costs are much harder to quantify than the hard transaction costs. It is likely that in this era of globalization these soft transaction costs, where a good business sense is needed to estimate their sizes and, as much as possible to avoid them, will become an increasingly important part of the total costs of economic activities. Indeed, as the hard costs due to trade liberalization and reducing transport costs decrease, the soft costs gain relative importance.

Box 2 Transaction management and marketing

Marketing can be considered a form of transaction management in so far as it is intended to provide information about the nature and quality of products or services. In principle, these forms of providing information through marketing reduce the information costs to buyers so that they will decide more often to purchase and make a transaction. The example of marketing shows that the line between what can be considered as the real production costs and what can be considered as transaction costs, is often difficult to draw. After all, marketing can also contribute to the image of a product and thereby increase the emotional value of the product. Think of all branded products and of the fact that some people are prepared to pay additional money if they can play on the same brand of basketball shoes as

Michael Jordan did. That part of the marketing costs can, like the development costs and direct production costs, be considered as part of the actual production costs. The same holds true for television commercials. In principle, their intention is to provide information on products and services, albeit biased. Therefore the costs of these commercials can be considered part of transaction costs. However, for some, a television commercial is simply a fun movie, and thus a consumer good. The costs of making such commercial would in that case be categorized as production costs.

Hard and soft transaction costs not only play a role in the normal commercial transactions where goods or services change ownership. Also in case of hiring personnel there are ample transaction costs to take into account: search costs, information costs, application costs, the costs of getting acquainted with the job, learning costs, redundancy costs and all costs of the personnel department, including advertising costs. Indeed, also here a contract is in a sense a form of transfer of property rights of an employee to his or her boss. In addition, the costs of marketing and information costs can partly be regarded as transaction costs (see Box 2). Within companies all kinds of departmental meetings, discussions about work routines, regulatory measures and internal compliance bring about transaction costs.

Economic theory of transaction costs

The focus of the economic theory on transaction costs is not new: Coase (1937) formulated the first ideas about it more than 70 years ago. The reason for Coase to consider transaction costs was to explain why firms of any size do exist in a world where the invisible hand of the market mechanism is supposed to provide an optimal allocation of goods and resources. The answer has already been given: the allocation of goods through market trade is not free but brings about all kinds of transaction costs. According to this theory of Coase, firm size depends directly on the nature of the transaction. In the case that the (marginal) transaction costs are higher for exchange within the hierarchy than for exchange through the market, it is obvious that parts of the firm are to be split and benefit from lower transaction costs of trade through the market. The firm size then decreases. The opposite - transaction costs are at the margin lower in the hierarchy than through the market - provides an argument for an expansion of the firm. It is also a reason why a takeover of a firm, or a merger between firms, may be considered to become successful. This argument is of current interest now that activist shareholders (private equity, hedge funds) interfere more and more with the strategic policies of firms in this respect. The perils surrounding the credit crisis of 2007-2009 also show that when such strategic calculations with respect to marginal transaction costs subsequently prove to be wrong, it will bring about huge societal transaction costs.

The further development and application of the economic theory of transaction costs to exchange transactions in the (international) trade is of a much more recent date. This trade oriented theory of transaction costs is based on a central notion in the work of Douglass North (1990), namely that the ongoing interaction between rules and players, or between institutions and organizations, underlies the success or failure of an economy. That is why trade theory is linked with the theory of institutional economics. Institutions in the sense of North do not only include formal institutions, such as legal rules and regulations. Informal institutions are very important as well, or even more so. These include socio-cultural phenomena such as the prevailing values and norms, mutual trust, and the commercial or mercantile skills of a nation. This is where the "soft" transaction costs come into the picture. Greif (1993,1994) has shown that

institutions play a crucial role in order to satisfy the basic condition for exchange, namely to be able to commit to a trade contract. (see the next section). In the early Middle Ages Jewish merchants - the "Maghribi traders" – were bound to keep their promises on trade agreements through family ties and other social networks, even though their deeds could only be controlled much later because of the large distances and time consuming travel. Later, this institutional system of using family ties was replaced by legal systems as institutions.

Recent work by Helpman (2006) illustrates the importance of the transaction costs for the success of firms in internationalization. The argument is that doing international business brings about considerably high costs in the start-up of, and during international operations. The consequence is that internationalization is only feasible for a firm of sufficient size. This scale - or specialization: being knowledgeable of doing international business - makes it achievable to recover the investment costs on knowledge on transaction costs in international trade over several transactions. Such scale and specialized knowledge of international issues is a prerequisite for firms to be able and continue to operate successfully in the current status quo of "open borders". In terms of the Edgeworth box the high transaction costs of international trade should be compensated by the large productivity gains due to economies of scale within the hierarchy of the firm.

Definition of transaction costs in the literature

As mentioned before, Coase (1937) was the first to introduce the concept of transaction costs in economic theory. His definition of transaction costs is short and compelling: *"The costs of using the price mechanism in the market."* In this perspective, transaction costs are all costs the market mechanism and the functioning of the market bring about. The economic theory of transaction costs is subsequently elaborated by Oliver Williamson, who, in 2009, joined Coase and North as winners of the Nobel price in economics. Williamson defines transaction costs as *"the costs of running the economic system"* (see e.g. Williamson, 1975, who followed Arrow, 1969; see also Williamson, 1993, 1998, 2000). Nowadays, the term transaction costs mainly relates to the transaction itself: it covers *all costs involved in entering into, implementing and complying with a transaction*. From that perspective Cheung (1987) defines transaction costs *"as all costs that do not occur in "Robinson Crusoe" economy of direct exchange"*. In other words all costs that in the description of welfare gains from exchange in the Edgeworth box are not taken into account.

North and Wallis (1994) distinguish between transformation costs and transaction costs. Transformation costs relate to the genuine processing of goods or services which is to be regarded as the actual production. In contrast, transaction costs occur when goods or services change ownership. North (1991) observes that the neoclassical paradigm as primary basis for traditional mainstream economic theory only holds true when there are no transaction costs. In other words, neoclassical theory assumes a frictionless economy. On the other hand, when there are transaction costs involved, they bring about allocative distortions. In that case the economy reaches a different equilibrium than when there would be no transaction costs. From the viewpoint of allocative efficiency, this new equilibrium is less than optimal. This is another way to illustrate that the lower the transaction costs are, the better it is for social welfare. In that case, more welfare-enhancing transactions may occur.

Williamson (1985) distinguishes three sources of transaction costs, namely:

- Bounded rationality,
- Opportunistic behavior and
- 'Asset specificity'.

The *bounded rationality* has two reasons: (a) information complexity, and (b) information uncertainty (Dietrich, 1994). Informational complexity refers to the fact that individuals have limited abilities to process all information that is available. Hence an individual is unable to process all relevant aspects of a transaction. Informational uncertainty on the other hand refers to the fact that it is impossible to perfectly foresee all future states of the world. Individuals engaged in a transaction can not perfectly foresee all contingencies involved in a transaction and therefore suffer from incomplete information (Tirole, 1988). When individuals are not globally rational, but behave according to bounded rationality, it is impossible to specify complete contracts without costs. Hence bounded rationality may lead to transaction costs. However, it is not a sufficient condition for such costs to occur. Bounded rationality is also cost-rational, if the marginal benefits from additional information gathering no longer justify the additional transaction costs due to incomplete information and the related incomplete contracts.

Opportunistic behaviour refers to the 'self-interest seeking behaviour' of individuals (Williamson, 1985). Without opportunistic behaviour it would not be necessary to fully specify complete contracts. Therefore, the transaction costs which would arise through bounded rationality do not exist per se, in case individuals do not want to gain advantage over the loss of another individual. However, when individuals exhibit opportunistic behaviour the opposite is true. Individuals may use the incompleteness in contracts, which exist through bounded rationality, to their own gain. This opens up opportunities for strategic behaviour, and executive hazards. This in its turn causes the necessity for trading partners to monitor each other, and to enforce contracts legally. The next section discusses how mutual trust may reduce the opportunistic behaviour and thereby imply lower transaction costs.

The third source of transaction costs that Williamson (1985) distinguishes is the existence of *asset specificity*. Asset specificity is defined as the extent to which an investment supporting a transaction has more value in that specific transaction, than in any other purpose (McGuinness, 1994). Asset specificity determines the scope of the continuing interest of both contracting parties in each other (Williamson, 1985). When there is no asset specificity, markets are perfectly contestable, and individuals will not want to invest in continuing economic relationships (Dietrich, 1994).

Asset specificity relates to goods or services that are bound to certain specifications. When the first transaction has been defined and approved with respect to these specifications, the following transactions can take advantage of the fact that the specifications are known so that less transaction costs are to be made. On the other hand, the more goods or services are tailored to the individual requirements of the buyer, the higher the asset specificity. Therefore, the degree of asset specificity can be considered an important determinant of transaction costs, and of how transaction management can create value. It is obvious that there is a relationship between asset specificity and standardization (see Den Butter, Groot and Lazrak, 2007), as standardization will make the specifications transparent and therefore will reduce asset

specificity. Uniform standards ensure that traders need to spend less time to define the specifications of the goods or services, so that they will encounter less transaction costs. On the other hand, the demands of buyers to suppliers can be so specific that standards have to be developed that can only be used in that particular situation. This makes the mutual interest that buyers and supplier have in maintaining their trade relationship, larger.

Modern theories on transaction costs and the organization of production

Section 2 already mentions that nowadays, with fragmentation of production and much international outsourcing, comparative advantages do no longer, in the Ricardian sense, relate to finished products and services, but rather to a trade in tasks. From that perspective Grossmann and Rossi-Hansberg (2008) present a model for the determinants of international trade, which makes an explicit distinction between trade in goods (which is the standard approach to modelling international trade) and trade in tasks. Here production involves conducting a continuum of 'tasks'. Different economies are now not trading in finished goods, but it are these tasks, or sub-sets of the production process, which are tradable. Some tasks may require high-skilled labour input, while other tasks require low-skilled labour or different categories of labour, or even other factor inputs like capital and raw materials.

Tasks can be performed abroad when it is less costly for a firm to perform a task offshore than domestically. Off shoring tasks incurs transaction costs. The crucial assumption is that some tasks are moved abroad more easily than others. It implies that moving some tasks abroad may incur more transaction costs than other tasks. So when will firms choose to move tasks abroad? This will only be the case when the joint costs of foreign factor input and transaction costs are less than the domestic costs of factor input. Hence in this framework, some tasks will still be performed at home, while others can be performed abroad.

What are implications of this distinction between trade in goods and trade in tasks? Let us assume that only low-skilled tasks can be moved abroad. By lowering transaction costs it becomes profitable to move more low-skill tasks abroad. Grossmann and Rossi-Hansberg (2008) distinguish three effects of the reduction in transaction costs:

- (i) a productivity effect;
- (ii) a relative-price effect and
- (iii) a labour-supply effect.

The productivity effect occurs through a decline in the costs of tasks being moved abroad. Firms incur lower costs, since more tasks can be performed offshore less costly, which drives up the demand for domestic factor inputs, hence increasing the return to domestic factors. The relative-price effect occurs through a change in the terms of trade of a country. This effect is likely to influence the return on low-skilled labour adversely. An improvement in the terms of trade, defined by the price of exports in terms of imports, will put downward pressure on low-skill wage since the exporting, high-skill industry becomes more profitable and will draw resources from the import-competing sector. Finally the labour-supply effect occurs through the release of domestic labour, which is freed by moving labour abroad. This effect is also likely to depress low-skill wages.

Meanwhile the decrease in the costs of offshoring affects high-skilled labour and other factor inputs as well. Offshoring of low-skill tasks has no productivity effect for other factor inputs, since it has no direct effect on the wage bill of these other factors. However, the relative-price effect and the labour-supply effect do have such a direct effect. The relative-price effect, causing an increase in the terms of trade, boosts the high-skill intensive exporting industry and hence the return on high-skilled labour. The labour-supply effect drives down relative prices of low-skilled labour, which is equivalent to an increase in the relative price of high-skilled labour.

All in all, the conclusion from this theory on trade in tasks is that a decrease in the costs of offshoring can affect the returns on low- and high-skilled labour in different ways. When, for low-skilled labour, the positive productivity effect outweighs the negative relative-price and labour-supply effects, low-skilled labour will benefit. Otherwise the return on low-skilled labour decreases. The return on high-skilled labour will increase in all cases, since both the relative-price effect and the labour-supply effect are positive. So from the perspective of distribution the important issue is whether positive effects for low-skilled labour outweigh the adverse effects. This appears to be different for a small economy and for a large economy. In the first case domestic low-skilled labour benefits from the increased offshoring and domestic high-skilled labour and other factors are unaffected. In the case of a large economy like for instance the United States, which can influence world prices, the situation is different. The question is whether the productivity effect outweighs the relative-price effect. This depends, for example, on the elasticity of demand of traded goods, which determines the relative strength of price-movements. The conclusion is that it is equally possible for low-skilled labour to benefit than it is to lose out from the reduction in the costs of offshoring. As before, the return on high-skilled labour is only affected by the relative-price effect and hence benefits from reducing the costs of offshoring. These effects do not differ very much when it is assumed that other tasks next to low-skill tasks become tradable as well.

However, the effect that domestic factors can gain from offshoring tasks could also be predicted by Ricardian determinants like comparative advantages. So the question is whether the trade in tasks model really makes a difference in explaining trade flows. Baldwin and Robert-Nicaud (2010) argue that it does. The special feature of the trade in tasks model is that when certain tasks are moved abroad, this is done in all industries. For example, when low-skill tasks are moved abroad, this is done both in the industry which is intensive in low-skilled labour and in the industry which is intensive in high-skilled labour. Therefore trade in tasks will even occur when there are no differences in relative endowments. This kind of trade is not explained by the traditional Heckscher-Ohlin framework. The trade in tasks model thus successfully links trade and transaction costs to Treffer's (1995) 'missing trade puzzle'.

Figures 1a and 1b picture the transition from trade in finished products and services to a trade in tasks (see Berghuis and Den Butter, 2009). Trade induced by comparative costs differences implies that a country will specialize in producing goods or services where its comparative cost advantage is largest as compared to its trading partner. Figure 1a illustrates this traditional Ricardian trade theory for two countries, A and B. Country A produces product X and the whole production process with tasks X1, X2 and X3 is executed at home. A similar situation applies for country B with product Y. Here the tasks Y1, Y2 and Y3 are conducted in the home country. In this traditional trade

situation comparative advantages in production lead country A to export X to B and country B exports product Y to A.

However when the potential for increased fragmentation of production becomes exploited, specialization will take place at a more detailed level, namely at the level of tasks. Now the international division of labour no longer covers the different products but the tasks in production. The higher the degree of standardization and the less the customer contact – so with less asset specificity - the easier it is to separate tasks that can be outsourced. Figure 1b assumes that the organization of the production of both product X and product Y takes place in country A. Apparently this country has a comparative advantage in orchestrating production. All tasks with respect to product Y are outsourced to country B, while for product X only task X3 is conducted at home, for instance because that task requires specific skills which cannot yet be outsourced or because the transaction costs of outsourcing are higher than the reduction of the costs of execution of the task. It is clear that a major change in trade flows between the countries results from this new organization of production. Country A is exporting both products X and Y whereas it is importing tasks. For country B, which has a comparative advantage in the execution of tasks, the opposite is true.

Figure 1a Traditional Ricardian explanation of international trade

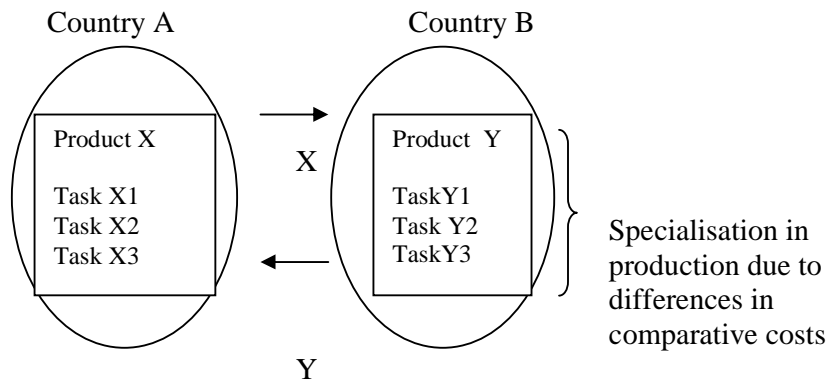
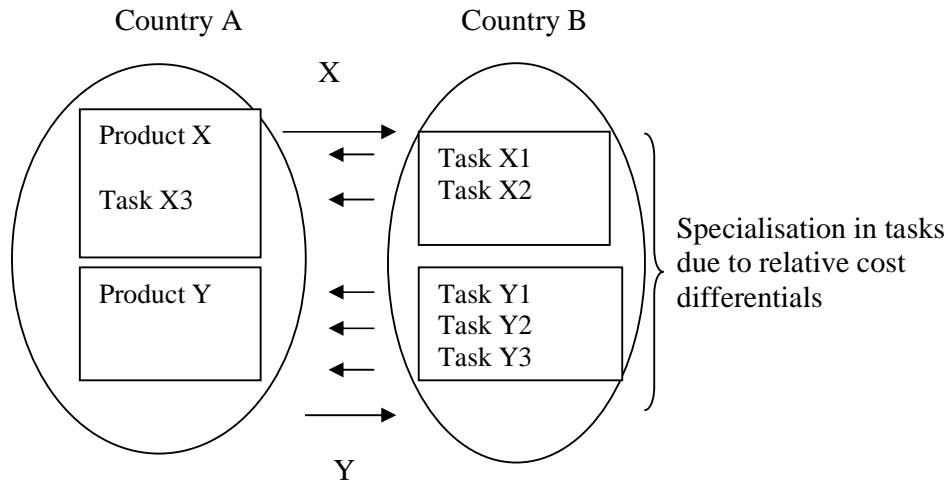


Figure 1b International trade resulting from fragmentation of production and trade in tasks



This trade in tasks can imply that trade within industries, so called intra-industry trade increases. But that is not necessary. After all, the tasks that are outsourced can equally well be executed as services that are attributed to other sectors. Think of the production of chips that are used in products from different sectors, or think of outsourcing the administration and parts of the ICT. Whatever may be the case, the increased focus on trade in tasks shows that a productivity increase does not solely have to be the consequence of a technological innovation in production, but that also a *transaction innovation*, which reduces transaction costs through better exploiting trade in tasks, can lead to an increase in measured productivity of the industrial sector.

The black box of the production function

The obvious result of these changes in the way international trade depends on comparative advantages is that a new economic theory is needed for a good understanding of the impact of globalization and fragmentation of production. The traditional theory of economic growth has to be elaborated in order to really understand what is happening. In their review article on these new theoretical developments Antràs and Rossi-Hansberg (2008) argue that the traditional theory of the production function sees the way that production factors are transformed to a final product, as a black box. The new theory seeks to open this black box. Not only the input volume of the production factors and the possibilities for substitution are important for the description of the production process, but also the organization of production should be made endogenous. This creates a theory where elements of the theory of industrial organization are integrated into trade and growth theories. Transaction costs play a major role in this combination of theories. An important aspect of this theory is that the heterogeneity of the production factors should be taken into account. In this context Grossman and Maggi (2000) describe how the choice of organization of production may depend on the available qualities of the workforce. So on the one hand there can be a production process where the knowledge of some brilliant creative people is needed, but on the other hand there can also be a production process that is based on established procedures using reliable workers who are used to comply with a hierarchical working environment. Firms may internally exploit these differences in talents for the organization of production, but it can also give rise to an international trade in tasks where one country is gifted with one type of talents and the other country with the other type.

Measurement of transaction costs

The characterization of various types of transaction costs and the split-up of total production costs in actual production costs and transaction costs has, up to now, only been discussed from a theoretical and qualitative perspective. However, in order to be able to quantify the relative importance of transaction costs still a considerable amount of research must be done. A first step is to come to a clear and operational classification of the various forms of transaction costs. This is necessary in order to show how important business transaction are for individual firms, and aggregated to the macro level, for the country as a whole. It should be realized that transaction costs do not only relate to trade and activities which are directly connected with the organization of production. Also various business services which support these activities bring about transaction costs. Consider the financial and legal services, and the bookkeeping and control services of accountants. The latter services ensure that the official reporting of

companies is correct so that everyone who has to do with the companies (suppliers, customers, financiers, shareholders, government) is not obliged to make (transaction) costs to value the reporting by the companies themselves. Probably a calculation of total transaction costs at the macro level will show that these costs do increase, also relatively in proportion to production costs. This seems paradoxical when the strength of a transaction economy is considered to be the ability to reduce transaction costs. Such result would mean that lower transaction costs more than proportionally foster transactions so that the higher volume of transaction more than compensates the lower unit price of transactions. It would corroborate the potential of the transaction economy. The lower transaction costs may involve an increase in the fragmentation of production, so that more tasks of the production process are outsourced. This will reduce the actual production costs so that transaction costs constitute a larger proportion of the total value added. The value creation in the transaction economy becomes more transaction intensive.

Making a clear cut split up of total costs in transaction costs and production costs is not well feasible. McCann et al. (2005) provide an excellent survey of these definition, categorization and measurement problems, with a focus on the transaction costs of government regulation. In spite of these problems some attempts have been made to estimate the size of transaction costs at the macro level. Following the methodology of North and Wallis (1986), De Vor (1994) asserted that in 1990 total transaction costs in the Netherlands economy amounted to almost 53% of GNP. It implies that more than half of value added in production in the Netherlands relates to conducting transactions. In the period 1960-1990 total transaction costs increased with about 9 %-points. This can be ascribed completely to an increase in the private sector. According to De Vor's measurement transaction costs in the private sector are (in 1990) over 5 times higher than in the public sector. Van Dalen and Van Vuuren (2005) measure by means of occupational data that in the Netherlands approximately 25% of workers is employed in transaction jobs, and 29% if one includes transport tasks. However, these occupational data do not take into account time spent on coordination by production workers. Klamer and McCloskey (1995) note that one quarter of the GDP is related to persuasion, i.e. talks to make "real production" possible. In their survey on "trade costs", Anderson and Van Wincoop (2004) illustrate the size of these trade costs by means of the tax equivalent of these costs: what would be the tax tariff on direct production costs if all trade costs where regarded as taxes – from a theoretical point of view trade costs have the same distortional effects on product markets as taxes. Anderson and Van Wincoop have a rather broad definition of trade costs so that it comprises most of the transaction costs discussed earlier in this section. Their main finding is that trade costs are large and variable. The example of the Barbie doll illustrates these large costs. The direct production costs of the doll are \$1, but they are sold in the US for about 10\$. So the costs of transportation, marketing, wholesaling and retailing have an *ad valorem* tax equivalent of 900%. In their calculations Anderson and Van Wincoop arrive at an estimate of the tax equivalent of "representative" trade costs for industrialized countries of 170%. The number breaks down as follows: 21% transportation costs, 44% border related trade barriers and 55% retail and wholesale distribution costs ($2.7 = 1.21 * 1.44 * 1.55$).

4. The fundamental problem of exchange and transaction cost economics

Transaction costs are associated with what Greif (2000) labels the fundamental problem of exchange. This fundamental problem is whether *one can ex ante commit to being able and willing to fulfil contractual obligations ex post*. In other words, a necessary condition for exchange is that for each partner in the exchange transaction there must be certainty that the other partner will keep its promise and deliver what has been agreed upon. Greif approaches this issue by stating that *one will not enter into a profitable exchange relationship until the other party can ex ante commit to fulfil his or her contractual obligations ex post*. Only under that condition the exchange can be mutually beneficial for both parties. This required security is often difficult to obtain because of a typical feature of many exchange transactions: it is *sequential*. It means that contracts and promises about delivery are made in advance of actual delivery and payment. This gives the party that is last to fulfil his or her obligations the opportunity to behave opportunistically and benefit at the expense of the other party. This problem becomes even worse when specific investments are required in a particular exchange relationship. In this situation there is the threat of a “hold-up”. Such hold-up – which is called after a raid on a stagecoach in the Wild West - implies that the last party to meet the obligations misuses the opportunity to change the conditions of the exchange to his or her advantage. In the case of a labour contract a hold-up may happen where a worker who has had high learning costs in order to get acquainted with the work and become productive, demands at that time a higher wage, so that his or her boss is unable to recover these learning costs. The threat of a hold-up constitutes an obstacle to entering into a exchange contract and should therefore be avoided. However, such a hold-up can only be avoided, when for both parties the associated transaction costs with keeping the contract are lower than of breaking the contract.

The fundamental problem of exchange thus essentially boils down to avoid the opportunistic behaviour associated with the sequential character of the exchange. In game theoretic terms the fundamental exchange problem can be understood as a form of the prisoners dilemma. The optimal solution in terms of welfare for both parties (the Pareto-optimal solution) implies that both sides behave cooperatively. However, for each party separately it is rational not doing so, which in principle results in a non Pareto-optimal outcome. That is why trade institutions are needed in order to ensure that there is an optimal solution in the prisoner's dilemma, for example through the enforcement of costly penalties if a party does not comply with the contract. In more general terms it is a solution of *the game of trust* which is required. A major observation in this respect is that institutions can contribute to this solution of the game of trust. This is elaborated below.

In a commercial exchange transaction three stages can be distinguished from the perspective of transaction costs, namely:

- The contact stage;
- The contract stage and
- The control stage

In the *contact* stage of a potential transaction, the buyer is looking for information about his or her preferred product (price and quality), potential suppliers, or, when the product does not yet exist, which producer could invent and/or produce it for her or him. The seller is trying to find a buyer for his or her product through marketing activities. Transaction costs come forth out the fact that information is not free, not complete and

not easily accessible. Traders have to invest in search. Evidently, this search for information is more difficult when, in an international context, communication is blurred by differences in language, differences in ways of information distribution and differences in culture based business norms. Reduction of the transaction costs of contact involves a mechanism with two essential characteristics. Firstly, information about business opportunities must be spread to all members of the business community who might be interested to be informed. Secondly, it must be guaranteed that this information is of high quality, i.e. the information can be trusted to be relevant and true. The distribution of reliable information is a characteristic function of networks (Casson, 1997). Mutual trust among the members of the network increases the quality of the information. Some empirical backing for this claim can be found in the studies of Rauch (2001) and Rauch and Trindade (2002) that point at the role of co-ethnic business networks in solving this problem of missing information about business opportunities. Ethnic (Chinese) networks seem to be more influential in bilateral trade on differentiated than homogeneous goods. Portes and Rey (1999) note the importance of the “geography of information”, measured by e.g. telephone call traffic and multinational bank branches, in a study on bilateral cross-border equity flows. Combes et al. (2002) present empirical support for their claim that business and social networks help to reduce informational trade barriers in France.

The *contract* stage starts directly after the moment the potential trading partners have found each other and are inclined to make a deal. Here transaction costs are made in negotiating the terms of the contract. Parties have to decide on how to make a reasonable split-up of the expected rents of the transaction and what to write down in the contract. They should not aim to put all eventualities in the contract. It is costly to write out all details, it is useless because some arrangements cannot be verified by third parties (verification problems), it is impossible because many eventualities can not be foreseen (fundamental uncertainty) and it may have unwarranted side-effects in the form of growing distrust between the parties if one takes explicit account of everything that might go wrong. Contracting becomes even harder in an international context. Parties have to learn the particularities of the legal system of the other country. In addition, cultural problems appear when one is contemplating what to write down (and what not) in the contract. The appropriate business norms vary between cultures. For example, in the United Kingdom it is common to write down every detail, while in other cultures, like the Dutch, it is customary to just write down the rough outline of the agreement and to fill in the details later, during the fulfilment of the agreement. These differences can lead to misunderstandings. Writing down all details creates a sphere of security in one case (the contract provides a solution for every problem that might occur), but it can also give a signal of distrust (why does the other party want to write down all these eventualities, does he foresee problems, doesn't he or she trust me?).

Cooray and Ratnatunga (2001) illustrate the problem in an interesting account of the troublesome co-operation between a Japanese customer and an Australian producer. They show how cultural differences lead to completely different perceptions about how to build a co-operative relationship. The Japanese buyer was focused on developing a long-term close relationship with his Australian partner, because it is customary in Japan to stay with a producer as long as the producer sells the product. It is a strategic decision with long-term consequences for a Japanese firm to choose a supplier. The Japanese therefore asked for much information about the quality and price of the product, and installed own personnel in the Australian firm, also because they are

accustomed to co-operate with their producers to improve the product. The Australian firm however was not used to provide such detailed information about their production process and costs. A second problem arose, because the Australians wanted to develop the relationship along personal lines, while the Japanese counted on strict formal control and evaluation procedures. In the end, a *link-pin*, with knowledge of both cultures and companies, was hired to solve the mutual adjustment problems. In general, striving for low contract transaction costs implies quick negotiations that result in a fair distribution of the rents.

The stage of *control* consists of the monitoring and enforcement of the contract. Both involve high transaction costs, especially at large distances. Monitoring means that business partners check whether the other party is doing what he or she promised to do. If the check turns out that this is not the case, the next step is enforcement of the contract. The most common solution for enforcement is to start a legal procedure. Especially in international trading relationships, this is often a troublesome affair. It takes time and money in large quantities and foreigners often feel being mistreated by prejudiced national courts when they file a claim against a national company. The outcome of the process can be quite uncertain. In general, there is the verification problem, which means that it is often very difficult or even impossible for third parties, like judges, to value the quality of the goods or services delivered. Country specific cultural values and norms also penetrate the national legal systems (see Bachmann 2001). In the United Kingdom, the law is commonly regarded as a device to protect the people from the government. The basic thought is that the government should not interfere in private matters. British judges therefore base their decisions in legal disputes extensively on what parties have voluntarily agreed on, even when power asymmetries might have influenced the voluntary element. In contrast the German and Dutch legal systems take the idea that contracts should be “reasonable” for both parties. The government is seen as a mechanism to correct injustices. German and Dutch judges therefore have and use the right to reinterpret and reconstruct contracts until their outcome can be considered “reasonable” for both parties. This means that two contracts with the same wordings can lead to different legal decisions, depending on the kind of legal system in the country in which the file is claimed. Here, the control transaction costs can be held low in cases where the transaction partners comply to the terms of the agreement, so that there is no need for intensive monitoring nor legal enforcement.

Table 1 summarizes the various types of transaction costs which are encountered in the three stages. It also indicates the reasons for these costs. It should be noted that the costs in the first stage, the contact stage, are so called sunk costs, which means that these costs are also to be made when the contract and the ensuing trade exchange eventually does not take place.

Table 1 Transaction costs in different stages of trade transactions

Stage	Type of transaction	Reason of costs	International complications	Due to:
Contact stage	Investment in information about customer / supplier or potential producer	Information is costly	Hindered communication	Differences in language
	Investing in the relationship	Information is incomplete Information is unavailable		Differences in culture Differences in means of communication
Contract stage	Investment in costs of preparing contract	Distribution of profits	Divergent expectations between the parties, verification problems and uncertainty	Differences in culture
Control stage	Costs of compliance of agreement	Formulation of Agreement Monitoring costs	Greater uncertainty	Differences in legal system Change of information by larger distance
	Investing in continuing/ improving the relationship	Enforcement of contract provisions		Problem of interpretation in verification Ignorance of law and system of values and norms

Solutions to the game of trust

As mentioned above, Greif’s argument that finding a solution to the fundamental problem of exchange is finding a solution to the game of trust. Here trust may be a substitute for extensive negotiations and drafting of contracts which can bring about a lot of transaction costs, and which are, from the economic perspective, never “complete”. Trust can be seen as an expectation about the future behaviour of the trading partner, where a false expectation may bring about considerable costs. When both parties trust each other, it implies that both parties expect a cooperative behaviour of the other party and therefore expect explicit or implicit compliance with the agreements.

In fact, in many circumstances trust between trading parties can be seen as a co-operative solution of a prisoners' dilemma where the trigger mechanism built in the repeated game does not completely exclude cheating. So placing trust is not a free lunch, there is a risk involved. That makes agents cautious to gather reliable information about potential business partners (contact), to carefully formulate the agreement (contract) and to adequately monitor and enforce it (control). What do people indulge to accept these risks and to trust the other, or how can this risk be contaminated so trust can develop? To answer this question, two main types of trust generating mechanisms can be distinguished, respectively with a *formal* and an *informal* basis (Den Butter and Mosch, 2003, Mosch, 2004).

In the case of formal trust we can for instance think of legal protection with respect to agreements between parties, where fines, or even the prospect of going to jail, can prevent opportunistic behaviour. More in general, institutions constitute a major device of solving the game of trust.

This "formal trust" is related to the rational choice concept of trust (Coleman, 1990) and extrinsic motivation (Frey and Jegen, 2001). Formal trust is closely linked to what is known by other authors as instrumental trust, rational trust, calculative trust (Williamson, 1993), self-interested trust (Lyons and Mehta, 1997), synthetic trust (Putnam, 2000), fragile trust (Lindenberg, 2000), narrow trust or egoistic trust (Nooteboom, 2002) and, to some extent, system trust (Luhmann, 1997, Bachmann, 2001). All these notions of trust are related to each other, in the sense that they see this type of trust as being about the calculation of selfish interests in pecuniary terms. It expects that people take into account all financial incentives involved, use a "rational way of thinking" and are not "hindered" by emotions. So, if it is profitable to cheat, one will cheat without remorse. People will act trustworthily when it pays to act trustworthily. The main idea of this approach is that the trust problem can be understood as a social co-ordination problem. To prevent that both players end up in the Nash equilibrium outcome of the prisoner's dilemma (both players playing the uncooperative or untrustworthy strategy), there are two solutions.

The first is to play the game an indefinite number of times. In other words, a repeated game is needed to solve the game of trust. This allows reputation effects to emerge. Trustworthy behaviour in the past forms a valuable asset, because it enhances the chance of finding future business partners. The reputation mechanism works best, when the time horizon of the players is large, when there are many potential partners, and when information about past behaviour is easily accessible to all players. This forms an important reason why trading networks exist, as they fulfil these requirements. The second solution is to change the outcomes of the game in such a way that it becomes favourable for the players to act in line with the agreement. On a bilateral level, this can be organised by promising bonuses for good compliance, or by taking "hostages" which are returned when the agreement has been fulfilled. Another way to invoke trustworthiness is by using intermediaries, for example banks that issue letters of credit. The most important way of solving the trust problem is of course by relying on the judicial power to enforce legal contracts. Threats of fines and imprisonment scare agents away from untrustworthy behaviour. So, according to this second solution a kind of contract, which is hopefully self-enforcing and prevents cheating, should preclude the traders to end up in the non-co-operative prisoner's dilemma solution of no trade.

It should be noted that these trust mechanisms on a formal basis cannot take away all risk. In the first place, bounded rationality and incomplete information make it impossible to make all necessary calculations. Moreover, the behaviour of other people is guided by fundamental uncertainty called free will (Nooteboom, 2002). Good prior intentions can always change when unforeseen circumstances occur. It has already been noted that legal contracts can be expensive, inherently incomplete, possibly unverifiable and subject to the particularities of the addressed legal system. On top of this, too much emphasis on formal trust might hurt informal trust. When relationships are guided by too much formal trust, based on extrinsic motivations, this can “crowd-out” informal trust which relies on intrinsic motivation (Tyler, 1998; Ostrom, 2000; Frey and Jegen, 2001; Bénabou and Tirole, 2003).

Trust mechanisms with an informal basis cover the relational and social-cultural mechanisms that build trust. Informal trust is based on intrinsic motivations (Frey, 1993). This type of trust is closely related to the concepts of social trust, moral trust, personal or blind trust (Williamson, 1993), socially-oriented trust (Lyons and Mehta, 1997), resilient trust (Lindenberg, 2000), broad or altruistic trust (Nooteboom, 2002), generalised trust (Putnam, 1993) and social capital (Fukuyama, 1995). Both at the individual level and at the institutional level, there are a number of different mechanisms that generate informal trust.

At the individual level, the way in which people deal with uncertainty varies from person to person. Responsible for this is the extent of “ontological security” a person experiences (Giddens, 1991). This has a direct influence on the individual “natural” level of trust in others, called “basic trust” (Giddens, 1991) or “trusting impulse” (Sztompka, 1999). In (bilateral) relationships, the problem of incomplete information is countered by the psychological mechanism of satisficing (Simon, 1983). Agents collect and process information unto a certain aspiration level. When co-operation goes on for a while, a personal relationship develops between the contracting partners and custom and routine slip in. This is a rational way to deal with bounded rationality, because the limited processing capacity of the human brain is not distracted by operations that go well. When the relationship proceeds within certain “tolerance boundaries”, attention can be given to other problems (Nooteboom, 2002). When these boundaries are crossed, the routine aspect of the trust relationship disappears and agents will pay close attention again to the relationship, collect information and possibly narrow the tolerance boundaries. When the relationship gets a very durable character, agents might reach the stage that they start to identify with each other and each others interests. This will first lead to making the relationship informally. Ethical and moral considerations start to rule the relationship. This can even lead to a distortion of the perception of the trustworthiness of the other party. An example of this is cognitive dissonance. Contradictions between facts (about the behaviour of the other party) and beliefs (about the trustworthiness of the other party) give an uneasy feeling, which is solved by reinterpreting the facts in such a way that the beliefs can hold. Then the relationship can be called one of blind trust. Apparently such situation should be avoided from the perspective of good transaction management, as it may incur unnecessarily high transaction costs.

Informal trust mechanisms are also active at a more collective level: in organisations, villages, cities, ethnic groups, networks and countries. In these groups, a trust culture might develop among its members. This is “a system of rules – norms and values –

regulating granting trust and meeting, returning, and reciprocating trust; in short, rules about trust and trustworthiness” (Sztompka, 1999: 99). If social control is effective, breaking such rules is followed by serious social sanctions.

The advantage of informal trust mechanisms above formal trust mechanisms is that one does not have to pay to keep afloat an entire legal system with its lawmakers, lawyers, judges and police. However, building informal trust can be a very difficult and lengthy process, especially when one wants to enter a group or network of which the membership ties are based on kinship, ethnicity, religiosity or place of birth. Examples of such closed trade network date from the Maghribi traders in the eleventh century (Greif, 1989, 1993), the Jewish diamond merchants in the 1960s (Wechsberg, 1966), to nowadays ethnic Chinese networks (Rauch and Trindade, 2002), mentioned before.

Micro economic game experiments suggest that these informal forms of trust are relevant to explain human behaviour in some economic situations. A common conclusion of those experiments – often shaped as social co-ordination problems – is that people are indeed inclined to behave trustingly and trustworthily (guided by norms as reciprocity and fairness), instead of playing the “rational” strategy of non co-operation. This result even holds true when high sums of money are at stake, when the participants are not students, and when no reputation effects can be built up (one-shot interaction with anonymous strangers); see Camerer and Thaler (1995), Berg, Dickhaut and McCabe (1995), Cameron (1999), Fehr and Gächter (2000) and Ostrom (2000).

A related informal form of trust is based on common values and norms. Being a member of the same cultural or religious society may induce people to trust and be trusted without any formal guarantee. This form of trust can primarily be found in homogenous communities with common values and norms where the “institutional setting” assures that in case of cheating the community will provide a costly punishment. These communities can consist of family, close friends, colleagues, members of the same profession, but also of citizens from the same village, region or country

It is difficult to judge which one of these different types of trust has most practical relevance. First there will be a substitution effect: when the legal system is better developed, the effects of corporate reputation and social networks are less important. Furthermore, there is complementarity: without a reasonably functioning legal system, reliance on an informal form of trust may also become more costly. In most practical situations there is generally a combination of two types of trust and their relevance may differ from situation to situation. In this respect, the question also arises to what extent both types of trust rely on rational behaviour or not. Here the distinction can be made between *calculative trust* and *moral trust*. Apparently formal trust can be associated with calculative trust and rational behaviour. But it may be true that reliance on informal trust can also be regarded as rational. Rationality, in this case, refers to a balancing of benefits and costs of cheating. For instance, when it has been very costly to build up a reputation of trustworthiness, and when by cheating this reputation gets lost whereas keeping the reputation will considerably reduce future transaction costs, it becomes rational not to cheat. This is exactly the repeated game character of the institutions for informal trust where a high price has to be paid for being expelled from the family or community, or for a loss of face. This may even explain why altruism has been detected in laboratory experiments with one shot games: the rationality to do so

may be found in a intrinsic drive to conform to social habits, or even in a fear of “God”.

Trust is related to various forms of transaction costs. These transaction costs both comprise the costs made in order to the establish trust based on formal institutions (contract drafting costs, investment costs in knowledge of foreign law, costs of monitoring arrangements, costs of legal proceedings for non-compliance) and to transaction costs associated with informal or relational aspects of trust (building common bonds and friendships, learning foreign languages and about foreign cultures). In terms of calculative trust all of these costs made to establish trust should be recovered by the lower transaction costs that the reputation of being trustworthy brings about. It should be mentioned that this building up of trust for trade relationships brings about positive externalities. Not only the traders themselves benefit from it in the negotiation of a transaction, the social welfare will also increase due to the benefits of specialization and scale effects which result from the additional transactions. This emphasizes that the provision of an efficient working (international) legal system and education in foreign languages and cultures partly has the character of a public good and should be considered a reason for involvement of the government, e.g. by the establishment of institutions which contribute to a solution of the game of trust at low transaction costs. Problems of trust between countries will impede trade. Increased trust among countries will remove these informal barriers to trade and will foster trade.

All in all, the literature on trust provides insights in some general mechanisms, which govern the relationship between trade, transaction costs and trust. It gives rise to the following hypotheses:

1. Trust problems are a source of trade barriers and transaction costs. More trust means less trade barriers and less transaction costs. Thus, more trust leads to more trade.
2. Two types of trust can be distinguished: formal trust and informal trust. Both types are important in international trade.
3. Another distinction is between calculative trust and moral trust. Although at first sight calculative trust, which is considered to stem from rational behaviour, seems to be linked to formal trust, whereas informal trust can be identified with moral trust, this may not be true. In fact, many types of informal trust also stem from rational behaviour in the sense that cheating brings about less gains than the costs of loss of reputation. Here the solution of the game of trust is institutionalized as a repeated game.

5 The economics of orchestration

Orchestrating the production chain

As has been noted previously the global fragmentation of production that breaking up the production chain and outsourcing parts of the chain to be produced abroad becomes increasingly important. To know how to do this is precisely what creates value in the era of globalization. This decoupling of the production chain and creating value by outsourcing requires a good skill of organizing and coordinating the whole production process. This is what the orchestrating function is all about. Transaction economies like the Netherlands focus increasingly on this orchestrating function, presumably because of their comparative advantages in specific knowledge and infrastructure.. It induces a shift of economic activity from production itself to organizing production. This

orchestration of the production based on the appropriate cost considerations of what, where and by whom to produce, is a vital issue for transaction management.

Orchestration gains importance with fragmentation of production

We can distinguish between comparative advantages *in* the various stages of production, and comparative advantages *between* different links of the chain. Large scale production, technological progress and process and product innovation within a link of the chain provide an advantage in direct production costs. It will bring about an increase in productivity within the specific stage of the production process and cause a competitive advantage for making that specific part of the product.

Organizational innovations and innovations that improve the coordination between the links of the production chain, reduce transaction costs and thus create value by increasing productivity in the orchestrating function. This implies a competitive advantage in orchestration. In a transaction economy with a tradition of trading the focuses is primarily on these kind of innovations that reduce transaction costs. Hence in such transaction economy economic activities are more and more directed toward the orchestrating function.

The increasing orientation of the industry sectors in transaction economies toward the orchestration function is inevitable in this era of globalization and fragmentation of production. Only those parts of the production chain where these economies have a real comparative advantage, are preserved for production at home. These are the parts of the chain which require very specific knowledge and where the coordination costs of outsourcing or subcontracting are higher than the benefits of specialization. (see also figure 1b). The trend, however, is that the benefits of outsourcing or subcontracting increasingly outweigh coordination costs. That is precisely why much of the actual industrial production and even production of services is no longer located in the transaction economies. It is a development that is present within many traditional industries and the boundaries between industry and service sectors become increasingly blurred. The required knowledge for orchestration has a general and a firm-specific component, but it can be expected that the importance of sector-specific knowledge will diminish.

Outsourcing: location and 'make or buy' decision

The above arguments make clear that fragmentation of production can take place in various ways. It has already been indicated that a first important choice to be made for the organization of production is whether to coordinate through the hierarchy or through the market: the *'make or buy'-decision*. This choice depends in conformity with the theory of Coase (1937) on the size of the transaction costs at the margin: when these marginal transaction costs are higher for production within a plant owned by the firm than when purchasing products from outside suppliers in the market, then production should be outsourced to the market. The opposite is true when purchasing at the market brings about more transaction costs, i.e. when vertical transaction costs are lower at the margin than horizontal transaction costs.

The second important choice is between foreign and domestic production, and more generally the choice is to determine where the individual components of the production

will be carried out. This is the *location choice* (see Box 3). Again, it are transaction costs at the margin which determine the choice. The relocation of production activities abroad - in general terms labelled as outsourcing and offshoring - where the transaction costs of moving production abroad are smaller than the gains through the decline in production costs, is now subject of much research. In case of outsourcing through the market it is indeed labelled and registered as outsourcing. In the case of foreign production in a plant owned by the firm, for example through a subsidiary, it is labelled and registered as foreign direct investment (FDI). Gains from moving production abroad, either through outsourcing or through FDI, will eventually stem from those parts of the production where production abroad is much cheaper, e.g. because of low wages. In case of FDI, these are the *vertical* FDI. The resulting trade, which is intracompany trade, can directly be explained from the theory of comparative advantages in trade in tasks. However, much of the FDI has a *horizontal* nature: the same goods and services are produced abroad as at home. Here access to the local market is often seen as an opportunity, where the benefits of direct access outweigh the transaction costs of relocation and potential diseconomies of scale. It should be noted that the gains of direct market access can be seen as a reduction of transaction costs, so that both vertical and horizontal FDI can be explained by comparative advantages in transaction costs. Incidentally, Helpman (2006) argues that the distinction between horizontal and vertical FDI gradually disappears due to the development of more complex integration strategies.

Table 2 summarizes the various choices to be made in the location and ‘make or buy’ decisions.

Table 2 Make or buy and location decision

Ownership Location	Make	Buy
Home	Domestic integration	Domestic outsourcing (subcontracting)
Abroad (off shoring)	Foreign direct investment	International outsourcing

Box 3 Krugman, winner of the Nobel price in economics in 2008 and the New Economic Geography

The location choice plays an important role in the theory of the New Economic Geography by Paul Krugman, winner of the Nobel Prize in Economics in 2008. It provides a complement to his ideas on international trade. Like in the theory of transaction management in this chapter, in Krugman’s theory the focus is on the falling costs of transportation and interactions. As a result, economies of scale in production can be better exploited. It promotes global specialization and induces a greater product variety, and hence it results in higher real wages. Moreover, such a reduction of transaction costs causes migration to the cities, which leads to a larger population in urban areas. This phenomenon is especially apparent in developing countries. But also in the industrial world, this migration to the city has a self-reinforcing effect which creates a highly developed urban center with a periphery

lagging behind in development. Krugman's ideas are very influential in policy analysis. An example is the analysis of the impact of the accession of new members to the European Union which is largely based on Krugman's approach. Something similar holds true for the regional policy of the European Union. Krugman has also shown that fears of a "race to the bottom" is unfounded in a world where scale effects of agglomeration economies are strong enough (Brakman et al, 2008).

The role of transaction costs and productivity gains in outsourcing can be illustrated in the following stylized numerical example. Suppose a firm has 10 employees which produce 100 units of a product. There is no capital involved. At a wage level of 10, the labour costs are 100. Now the firm decides to outsource production to a country where production costs are half of those at home. In this new situation the 10 employees are transferred from production at home to the orchestration in the low wage country where they are able to achieve an output of 400 units. Production costs are now 200 (400×0.5) and the transaction costs of outsourcing 100 (pay for employees in the orchestrating function). Total costs are therefore 300, so that productivity rises with 100% (from 100 to 200). These profits can be distributed among the employees so that their wage increases to 20, or they can be used for reducing the price of the product. (or it can be reinvested or be paid to shareholders) Whatever is the case, in the current compilation method of the National Accounts, the productivity gains are seen as to increase the productivity of the industry, while in reality it should be attributed to trade and transaction innovations and not to process or product innovations, such is usually the case with economic analyses of productivity growth in industry. Instead, it is the productivity effect of outsourcing, described by Grossman and Hansi-Rosberg (2008) in their theory on the trade in tasks, which causes this increase in productivity in industry.

For the reason of simplicity the numerical example assumes that employment at home does not change. The 10 employees who first were production workers, are now engaged in organizing and coordinating the production in the low wage country. In this example the outsourcing of production, and resulting increase in the production will create new employment abroad. How many new jobs are created in the low-wage country depends on the relative productivity and wages in that country. If productivity in the low wage country is half of that at home (5), the wages in the low wage country are assumed to be $\frac{1}{4}$ of the wages at home (2.5). It implies that the additional employment in the low wage country is 80 ($400 / (\frac{1}{2} \times 10)$).

The numerical example shows a number of strategic issues which should be taken into account in the decision to move production abroad:

- the size of the transaction costs of relocation; here also long term effects and risks should be considered.
- the price elasticity of demand, i.e. the ability to sell more products and the room it gives to reduce the product price as a consequence of the productivity gain; in other words, the issue is the distribution of productivity gains between consumers and producers.
- the future development of wages in the country whereto the production is outsourced; may be at the time the decision is taken, wages are still low, but maybe for the foreseeable future a significant increase will take place.

- the development of wages at home, including the transition costs of training of the employees for their new jobs as orchestrators and coordinators; these transition costs can be considered a non recurrent part of transaction costs. In this example these training costs are not taken into account. Furthermore it is assumed that the wage of employees with a orchestrating function is equal to that of those with a production function.

It is clear that the strategic decision of firms to move production abroad is a difficult one and requires a lot of good information and intuition (which can be characterized as good trading skills and an entrepreneurial spirit). Underestimation of transaction costs associated with such outsourcing may cause that eventually outsourcing does not appear to be beneficial after all and that the outsourcing of production is reversed. Another reason to regret the strategic decision to outsource may be that too much weight is given to labour costs and that the cultural differences in countries with low wages (eg in Asia) are not properly taken into account. These additional and unforeseen transaction costs may even be so large that it is ultimately better and more profitable to outsource to countries with higher wages (eg Eastern Europe) but where the cultural barriers are lower. Moreover, the numerical example assumes that the quality of the outsourced production is equal to the quality of production at home. Maintaining such quality in outsourced production may also entail unexpectedly high transaction costs, or it may lead to a poorer product quality so that the sales revenue decrease. It will also make outsourcing less profitable than originally expected.

6 Conclusions

This chapter outlines the importance of transaction management for the Dutch economy and for similar modern open economies where welfare creation depends much on trade and the organization of production. In this context *transaction management is the skill and ability to keep transaction costs as low as possible in all given circumstances*. However, this proposition does not yet provide a clear picture of what transaction management really is, and of the reasons why it is an important method of strategic analysis in policy decisions for the industry. First some possible misconceptions about transaction management are pointed out.

- Transaction management goes far beyond its traditional meaning, namely minimizing the transaction costs of financial transactions, such as payment and administrative services. Yet it is noted that the way transaction management is elaborated in this chapter encompasses this original narrow connotation of transaction management.
- On the other hand, transaction management is no panacea for all problems where there is a need for cost reduction: it is a way of analysis from a specific perspective, namely that of the transaction costs.
- Transaction management does not solely seek to reduce existing transaction costs: there should be a good balance between existing and possible future transaction costs due to increased risks (e.g. costs of safety).
- Transaction management is not one of the many heuristic management principles or tools: instead it is based on the scientific theory of transaction cost economics, a theory that was conveyed by Nobel Prize winners (Coase, North and Williamson) and that has been elaborated in articles in all leading economic journals.

- Transaction management is no less relevant when transaction costs do get reduced by good transaction management. On the contrary, thanks to good transaction management the globalized world has, and will, increasingly become more transaction intensive so that the importance of transaction management also increases. Transaction costs per transaction may decrease, but just because of transactions become less expensive, it enables more fragmentation of production and trade in tasks, so that in the end the ratio of transaction costs to sheer production costs increases.

The above list already implicitly gives a number of characteristics of transaction management. What other aspects of transaction management are worth mentioning?

- Transaction management is a skill that creates great value especially in a transaction economy. Therefore it should be regarded as a key competence for the business sector in such transaction economies, and the education and science policy should be aware of that crucial role.
- Transaction management relates both to (horizontal) business transactions through the market and to (vertical) transactions through the hierarchy or through alliance agreements within companies.
- Transaction management translates theoretical knowledge of the economic theory of transaction costs (which combines parts of the macro oriented theories of institutional economics, industrial organization and international economics) to a practical decision method.
- Transaction management creates value in a globalizing world by promoting a further fragmentation of production. It implies that companies in transaction economies will increasingly be engaged in the orchestration of production and in the 'make or buy' and location decisions with respect to outsourcing of tasks.
- The fact that transaction management acts as key competence also means that trading nations remain an attractive location for foreign head offices from where the orchestrating function is performed.

References

Anderson, J.E. and E. Van Wincoop, 2004, Trade Costs, *Journal of Economic Literature*, 42, pp. 691-751.

Antràs, P. and E. Rossi-Hansberg, 2008, Organizations and trade, *NBER Working Paper W14262*.

Arrow, K.J., 1973, *Information and Economic Behavior*, Stockholm: Federation of Swedish Industries.

Bachmann, R., 2001, Trust, power and control in trans-organizational relations, *Organization Studies*, 22, pp. 337-365.

Baldwin, R. and F. Robert-Nicoud, 2010, Trade-in-Goods and Trade-in-Tasks: An Integrating Framework, *CEPR Discussion Paper No. DP7775*

Bénabou, R. and J. Tirole, 2003, Intrinsic and extrinsic motivation, *Review of Economic Studies*, 70, pp. 489-520.

Berg, J, J. Dickhaut and K. McCabe, 1995, Trust, reciprocity and social history, *Games and Economic Behavior*, 10, pp.122-142.

Berghuis, E. and F.A.G. den Butter, 2009 Veranderende wereldhandelspatronen door globalisering (Changing patterns of world trade through globalisation) , *Economisch Statistische Berichten*, 94, pp. 134-137.

Brakman, S., H. Garretsen and Ch. van Marrewijk, 2008, Nobelprijs economie voor Paul Krugman (the Nobel prize in economics for Paul Krugman), *Economisch Statistische Berichten*, 93, pp. 660-663.

Butter, F.A.G. den, and R.H.J. Mosch, 2003, Trade, trust and transaction costs, *Tinbergen Institute Discussion Paper* TI 2003-082/3.

Butter, F.A.G. den, S.P.T. Groot and F. Lazrak, 2007, The transaction costs perspective on standards as a source of trade and productivity growth, *Tinbergen Institute Discussion Paper* TI 2007- 090-3.

Butter, F.A.G. den, and R. Hayat, 2008, Trade between China and the Netherlands: a case study of globalization, *Tinbergen Institute Discussion Paper* TI 2008- 016-3.

Camerer, C.F. and R.H. Thaler, 1995, Ultimatums, dictators and manners, *Journal of Economic Perspectives*, 9, pp. 209-219.

Cameron, L., 1999, Raising the stakes in the ultimatum game: experimental evidence from Indonesia, *Economic Enquiry*, 37, pp.47-59.

Casson, M., 1997, *Information and organisation*, Oxford: Clarendon Press.

Cheung, S.N.S., 1987, Economic organization and transaction costs, *The New Palgrave: a Dictionary of Economics*, 2, pp. 55-58.

Coase, R.H., 1937, The nature of the firm, *Economica*, New Series, 4, pp. 386-405.

Coleman, J.S., 1990, *Foundations of Social Theory*, Cambridge: Harvard University Press.

Combes, P.P., M. Lafourcade and T. Mayer, 2002, *Can business and social networks explain the border effect puzzle?*, CEPR Discussion Paper 3750, London: CEPR.

Combes, P-Ph., M. Lafourcade and Th. Mayer, 2005, The trade creating effects of business and social networks: evidence from France, *Journal of International Economics*, 66, pp. 1-20.

Cooray, S. and J. Ratnatunga, 2001, Buyer-supplier relationships: A case study of a Japanese Western alliance, *Long Range Planning*, 34, pp. 727-740.

Dalen H.P. van, and A.P. van Vuuren, 2005, Greasing the wheels of trade. *De Economist*, 153, pp. 139-165.

- Dietrich, M., 1994, *Transaction Cost Economics and Beyond: Towards a New Economics of the Firm*, London: Routledge.
- Fehr, E., and S. Gächter, 2000, Fairness and retaliation: the economics of reciprocity, *Journal of Economic Perspectives*, 14, pp. 159-181.
- Frey, B.S., 1993, Shirking or work morale? The impact of regulating, *European Economic Review*, 37, pp. 1523-1532.
- Frey, B.S. and R. Jegen, 2001, Motivation crowding theory, *Journal of Economic Surveys*, 15, pp. 589-611.
- Fukuyama, F., 1995, *Trust: the Social Virtues and the Creation of Prosperity*, New York: Simon and Schuster.
- Giddens, A., 1991, *Modernity and Self-identity: Self and Society in the Late Modern Age*, Cambridge: Polity Press.
- Greif, A., 1989, Reputation and coalitions in medieval trade: evidence on the Maghribi traders, *Journal of Economic History*, 49, pp. 857-882.
- Greif, A., 1993, Contract enforceability and economic institutions in early trade: the Maghribi traders coalition, *American Economic Review*, 83, pp. 525-548.
- Greif, A., 1994, Cultural beliefs and the organizations of society: a historical and theoretical reflection on collectivist and individualist societies, *Journal of Political Economy*, 102, 912-950.
- Greif, A., 1997, Microtheory and recent developments in the study of economic institutions through economic history, Ch. 3 in D.M. Kreps and K.F. Wallis, *Advances in Economics and Econometrics: Theory and Applications*, (Seventh World Congress Volume II), Econometric Society Monographs No. 27, Cambridge: Cambridge University Press, pp. 79-113.
- Greif, A., 2000, The fundamental problem of exchange: a research agenda in historical institutional analysis, *European Review of Economic History*, 4, pp. 251-284.
- Grossman, G.M., and G. Maggi, 2000, Diversity and Trade, *American Economic Review*, 90, pp. 1255-1275.
- Grossman, G.M. and E. Rossi-Hansberg, 2006, *The Rise of Offshoring: It's Not wine for Cloth Anymore*, July 2006. Paper presented at Kansas Fed's Jackson Hole conference for Central Bankers.
- Grossman, G. and E. Rossi-Hansberg, 2008, Trading tasks: a simple theory of offshoring, *American Economic Review*, 98, pp. 1978-1999.
- Helpman, E., 2006, Trade, FDI and the Organization of Firms, *NBER Working Paper* No. W12091, March 2006.

- Klamer, A. and D. McCloskey, 1995, One quarter of GDP is persuasion, *American Economic Review*, Papers and Proceedings, 85, pp. 191-195.
- Lindenberg, S., 2000, It takes both trust and lack of mistrust: the workings of cooperation and relational signaling in contractual relationships, *Journal of Management and Governance*, 4, pp. 11-33.
- Luhmann, N., 1979, *Trust and Power*, Chichester: Wiley.
- Lyons, B. and J. Mehta, 1997, Contracts, opportunism and trust: self-interest and social orientation, *Cambridge Journal of Economics*, 21, pp. 239-257.
- McCann, L., B. Colby, K.W. Easter, A. Kasterine and K.V. Kuperan, 2005, Transaction cost measurement for evaluating environmental policies, *Ecological Economics*, 52, pp. 527-542.
- McGuinness, T., 1994, Markets and managerial hierarchies, in G. Thompson et al. (eds.) *Markets, Hierarchies and Networks*, London: Sage Publishers, pp. 66-81.
- Mosch, R.H.J., 2004, *The Economic Effects of Trust; Theory and Empirical Evidence*, Tinbergen Institute Research Series no. 340, Amsterdam: Thela Thesis/Tinbergen Institute.
- Nooteboom, B., 2002, *Trust: Forms, Foundations, Functions, Failures and Figures*, Cheltenham: Edward Elgar.
- North, D.C., 1990, *Institutions, Institutional Change and Economic Performance*, Cambridge (MA): Cambridge University Press.
- North, D.C., 1994, Economic performance through time, *American Economic Review*, 84, pp. 359-368
- North, D.C. and J.J. Wallis, 1986, Measuring the transaction sector in the American economy. In: Engerman SL, Gallman RE (eds), *Long Term Factors in American Economic Growth*, Chicago: University of Chicago Press, pp. 95 - 161
- North, D.C. and J.J. Wallis, 1994, Integrating institutional change and technical change in economic history: a transaction cost approach, *Journal of Institutional and Theoretical Economics*, 150, pp. 609 – 624.
- Ostrom, E., 2000, Collective action and the evolution of social norms, *Journal of Economic Perspectives*, 14, pp. 137-158.
- Putnam, R.D., 1993, *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton, N.J.: Princeton University Press.
- Putnam, R.D., 2000, *Bowling Alone: the Collapse and Revival of American Community*, New York: Simon and Schuster.

- Rauch, J.E., 2001, Business and social networks in international trade, *Journal of Economic Literature*, 39, pp. 1177-1203.
- Rauch, J.E., and V. Trindade, 2002, Ethnic Chinese networks in international trade, *The Review of Economics and Statistics*, 84, pp. 116-130.
- Simon, H.A., 1983, *Reason in Human Affairs*, Oxford: Basil Blackwell.
- Sztompka, P., 1999, *Trust: a Sociological Theory*, Cambridge: Cambridge University Press.
- Tirole, J., 1988, *The Theory of Industrial Organization*, 1st edition, London: MIT Press.
- Trefler, D., 1995, The case of missing trade and other mysteries, *American Economic Review*, 85, pp. 1029-1046.
- Tyler, T.R., 1998, Trust and democratic governance, in Braithwaite, V. and M. Levi (eds.) *Trust and Governance*, New York: Russel Sage Foundation, pp. 269-294.
- Vor, M.P.H. de, 1994, Meting van transactiekosten in de Nederlandse economie, *Maandschrift Economie*, 58, pp. 166-177.
- Wechsberg, J., 1966, *The Merchant Bankers*, New York: Bedminster Press.
- Williamson, O.E., 1975, *Markets and Hierarchies: Analysis and Antitrust Implications*, New York: Free Press.
- Williamson, O.E., 1979, Transaction cost economics: the governance of contractual relations, *Journal of Law and Economics*, 22, pp. 233-261.
- Williamson, O.E., 1985, *The Economic Institutions of Capitalism*, New York: Free Press.
- Williamson, O.E., 1993, Calculativeness, trust, and economic organization, *Journal of Law and Economics*, 36, pp. 453-486.
- Williamson, O.E., 1998, Transaction cost economics: how it works; where it is headed, *De Economist*, 146, pp. 23-58.
- Williamson, O.E., 2000, The new institutional economics: taking stock, looking ahead, *Journal of Economic Literature*, 38, pp. 595-613.