

The economic rationale and labour market effects of outsourcing: a survey

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1. Introduction

The growing importance of outsourcing activities has given rise to an important economic literature on its impact on jobs, wages, efficiency and economic competitiveness. The purpose of this chapter is to present the economic rationale for outsourcing activities and to document the empirical evidence on the impact of outsourcing on wages and employment. Its focus will be both on the outsourcing decision at the firm-level (domestic outsourcing) and on international outsourcing.

To analyse the economic rationale for domestic outsourcing, we will apply the theory of the firm as a theory of vertical *disintegration*. In this sense, outsourcing is understood as the split-up of two elements in the production chain which were formerly organized in one firm into two separate firms. By analysing why certain production processes were integrated in a firm in the first place, one also understands why firms decide to return to pure market exchange, i.e. why they outsource. We will also present some empirical findings about the determinants and effects of firm-level outsourcing.

The other main focus of this chapter is on international outsourcing defined as substitution of production activities made within the firm by purchases of intermediate inputs from foreign firms. Whereas usual macroeconomic approaches deal with the formation and allocation of value added, they neglect, by construction, the role of intermediate material inputs and consider only imports and exports of *final* products. Recent contributions have explicitly considered intermediate material

inputs in the production decision process in order to better understand the driving forces of outsourcing.

The common denominator of most contributions is the principle of maximization under constraints. The purpose of cost reduction or profit maximisation not only determines the optimal amount of outsourcing but also the optimal labour demand as well as the substitution possibilities between outsourcing and labour inputs.

In a closed economy the impact of outsourcing on total employment is certainly quantitatively not very important since it mainly reallocates jobs from one firm to others. In an open economy in contrary, international reallocation may hurt employment in some countries. Since macroeconomists are mainly interested in the aggregate (national) outcome of outsourcing, we focus on international outsourcing in this chapter.

In order to reach this objective, it is important to consider the specificities of labour markets, which are quite different across countries. Whereas in countries where unemployment rose over the last decades, researcher study the impact of outsourcing on unemployment and the demand for labour, in countries where wages disparity increased researchers mainly investigate the relationship between outsourcing and wages. Both aspects will be surveyed in this chapter.

2. Economic theories of outsourcing

The following two sections will discuss various theoretic approaches to explain the outsourcing phenomenon. In the first part, insights from the theory of industrial organization about firms' vertical structure will be reviewed and applied to the outsourcing decision. The main emphasis will be on problems of asset specificity, incomplete contracts, and the hold-up problem. In the second part, international outsourcing will be discussed.

2.1. Outsourcing at the firm-level

It is one of the central questions in economic theory, especially in the theory of industrial organization, to explain why some productive activities are organized within firms, while others are conducted by market exchange between firms. In answering this question, traditionally the emphasis of economics was not so much on the question of outsourcing as on why firms “insource” activities in the first place. In principle, all transactions necessary in the various stages of production could be undertaken using the spot-market or short-term contractual relations. In such an economic system, the production of any good would be conducted by the market interaction of atomistic production units, and thus everything would be “outsourced.” The simple reason why we do not observe such extreme forms of market exchange in real-life economies is that market transactions are not costless. To avoid such transaction costs, some portions of the production process are withdrawn from short-term market exchanges and are instead governed by long-term relations, which are called “firms.” Starting with Coase (1937), the existence of non-market modes of production has spurred the development of the “theory of vertical integration”, which is at the same time a theory of outsourcing.¹ Once one recognizes why firms as an integrated mode of production exist, one can understand why firms decide to vertical *disintegrate*, i.e. why they outsource.

The driving force of vertical integration are transaction costs. A firm’s procurement of inputs from independent suppliers is not costless – contracts have to be written, business conditions have to be negotiated, the quality of inputs has to be monitored etc. Of course, in-house production is not costless either, as it creates problems of workforce training, monitoring, and motivation. Therefore, transaction cost assessments are comparative by nature. However, two phenomena clearly shift the balance in favour of in-house production: asset specificity and uncertainty with respect to the future.

Many business transactions involve investments which are specific. Such specificity can arise because suppliers must design equipment specific to the buyer’s order (a car-component supplier produces parts that can only be used in a particular car-maker’s models), because a buyer promotes or sells a final product before an

¹ A detailed overview of the theory of vertical integration is given by Perry (1989). A shorter treatment can be found in Williamson (1996).

intermediate good is delivered (promoting a concert in a particular concert hall), or because users of raw materials invest in machinery that only works with this special kind of input (a power plant that can only combust a specific type of coal) (Tirole 1988, p. 21). Other types of specificity are site specificity and firm-specific human capital (Williamson 1975). By locating close to a potential buyer or seller, firms can obtain a cost advantage specific to this site. A worker obtains firm-specific human capital by investing in training that increases his or her productivity only with the technology applied in one particular firm.

Making specific investments fundamentally transforms the relations of two firms. After a specific investment has been made, it becomes a sunk cost, i.e. its next-best alternative use yields a much lower payoff compared to the use it is specific for. Asset specificity creates a lock-in effect: the part of the profits exceeding the payoff from alternative uses can only be achieved if the business relation with the respective partner is continued. Since this part of profits is what exceeds the profits the two firms could make with outside partners, it is an “appropriable quasi-rent” (Klein et al. 1978). No market forces can prevent either of the two firms from trying to appropriate these rents and the division will be determined by the two firms’ bargaining in a bilateral monopoly.

If contracts could be written before specific investments are undertaken, this would not cause a problem. The division of the quasi-rents would be determined ex ante in a way that gives the right investment incentives to the party making the specific investment, and the investment decisions could be made in an efficient way maximizing the joint profit of the two firms. The problem is, however, that contracts governing business relations are generally incomplete. Economic environments are complex and uncertain, so it is impossible to design contracts that account for all possible contingencies. This is because contingencies are either not foreseeable at the contract date or there are too many to include them in the contract. In other cases, contracts might not be enforceable because contingencies are not observable by third parties, e.g. courts. With incomplete contracts, each firm will try to act opportunistically and appropriate the quasi-rent after the investment is sunk. Anticipating that it might not be able to reap all the benefits from its investment, each firm will not invest efficiently in the specific asset ex-ante. This inability to pre-

commit leads to underinvestment and less than maximum joint profit. This is the so-called “hold-up” problem.

The failure to maximize joint profits indicates that both parties prefer organizational modes in which they cannot be held up. One way of solving the problem is to integrate both firms, which eliminates the hold-up problem. An integrated firm has no incentive to opportunistically appropriate quasi-rents and will thus undertake the efficient level of investment.

Of course, integration is costly too. Larger firms have more difficulties monitoring employees or identifying the productivity of single workers or departments, resulting in attenuated incentives. Also, large institutions are typically associated with higher bureaucratic distortions and costs. Thus, a simple cost-benefit-analysis looks like this: the benefits of integration are that the specific asset is accumulated at the efficient level and joint profits are maximized. The costs are the institutional difficulties of managing a large organization. By comparing the two, the optimal pattern of integration for each firm can be derived.

The theory of vertical integration predicts that firms integrate if their relationship is dominated by specific investments. Conversely, this theory would predict that outsourcing should occur if the degree of asset specificity declines. Such a decline could occur under various circumstances. For example, it will often occur in growing industries. An industry in its early stages of development will typically be comprised of a small number of firms at each point in the value-chain producing specialized products. In such a value-chain, each firm faces specificity both with respect to its inputs and its output. Therefore, one would expect to see a large level of integration in such a value chain. As the industry grows, more firms enter each point of the value chain such that upstream and downstream firms can avoid being held up more easily by reverting to firms producing similar products. Moreover, other industries might discover how to make use of the value-chain’s various products. In this process, the level of asset specificity is declining continually. Since the hold-up problem ceases to be important, but firms face bureaucracy costs if they stay integrated, the optimal reaction is clear: firms disintegrate and outsource parts of their production.

The divestiture of a monopoly can also cause downstream outsourcing. If an intermediate good is specific because its supplier is a monopoly, the resulting hold-up problem and underinvestment could cause the monopoly to integrate with the downstream firms. If the intermediate monopoly is divested into a number of smaller, but fully integrated firms, these new firms will not stay integrated since the initial reason to integrate has vanished.

Abstracting from the particular problems of asset specificity and incomplete contracts, other models have been developed that illuminate part of the reasons why under specific circumstances firms might optimally decide to (dis)integrate.

A line of literature emphasizes the role of demand fluctuations on vertical integration. Perry (1984) analyses a two-stage production chain in which there exists exogenous random net demand on the market for an intermediate good. This causes the price of the input good to fluctuate. Since profit functions are convex in the output price, sellers prefer to “ride the highs and lows of the market” instead of trading at the expected price; buyers prefer the same since cost functions are concave in input prices (cf. Oi 1961). Perry (1984) assumes that integration saves transactions costs; by integrating, however, firms withdraw from the intermediate good market and forego the benefits of demand fluctuations. If transaction costs savings exceed the benefits from “riding the market”, some firms will integrate. This will strengthen the influence of the exogenous demand component and make prices more volatile, thus raising the benefits from non-integration. An equilibrium will occur at some intermediate level of integration, where the two effects exactly balance. The model provides an explanation for the observation that seemingly identical firms opt for different outsourcing strategies.

De Kok (2000) offers a production-theoretic model of outsourcing which also incorporates fluctuating demand. A firm has to fix its productive capacity before knowing the exact demand for its product. If demand exceeds the pre-determined capacity, the firm has two choices: it can either postpone to serve the excess demand or it can serve the excess demand by hiring the productive capacity of other firms (outsourcing). It is assumed that outsourcing is more costly than serving demand by the firm’s own capacity (if not, all capacity would be outsourced). In the model,

optimality rules are derived which determine the optimal fixed capacity and the decision when to postpone service and when to use outsourcing. Intuitively, a higher interest rate favours outsourcing as postponing becomes more costly. Higher volatility of demand favours outsourcing as it becomes more likely that fixed capacity lies idle.

Generally, outsourcing means that buyers and sellers have to search for suitable trading partners. Grossman and Helpman (2002) take this as a starting point to develop a matching model of outsourcing. Their model is able to explain cross-regional differences in outsourcing by “market thickness”. If there are increasing returns to scale in matching, “thicker” markets (more buyers and sellers) reduce search costs and thus induce more outsourcing. Certain other developments might have had an influence on the efficiency of the search technology, e.g. IT-services might have made finding business partners easier and thus have accelerated outsourcing. More densely populated areas, or more closely networked economic environments in general, should see larger levels of outsourcing.

Outsourcing might also serve as a second-best reply to the non-integrability of specific factors. In the model of Lyons and Sekkat (1991), two firms suffer from a possible hold up-problem due to the specificity of the good traded between them. Although the two firms can integrate and thus eliminate this problem, both are still subject to potentially opportunistic behaviour of labour unions. Unions are input suppliers that firms cannot integrate. Outsourcing might be a way to alleviate union power, even at the cost of hold-up behaviour. As the theory of the second best predicts, some distortions might be desirable if they help alleviating an unavoidable distortion. Outsourcing can decrease the power of unions, either because they have to negotiate with separate firms (and thus cannot utilize the complementarity of labour in the two stages of production; cf. Horn and Wolinsky 1988), or because production is sourced out to a non-unionised firm. Even though part of the profits has to be given to the subcontracting firm (opportunistic hold-up bargaining), less has to be given to the union. Lyons and Sekkat (1991) show that under certain conditions the latter effect dominates and outsourcing can increase the firm’s profits.

Various institutional and legal reasons can also affect the outsourcing decision. To just mention one, employment protection legislation decreases the discretionary

power of management to adjust a firm's employment level at will. Since contracts made with input suppliers are typically not subject to employment protection, firms can circumvent such restrictions by outsourcing. For example, the subsequent adoption of the unjust dismissal doctrine by various US states has significantly spurred the rise of temporary help services, which provide a convenient way to outsource employees (Autor 2003).

2.2. International Outsourcing

The outsourcing phenomenon not only affects the production structure between different firms, but also between different regions and countries. The rising integration of world markets is associated with a disintegration/delocalisation of the production process. The main causes for this development can clearly be found in trade liberalization and lower transportation costs.

By "international outsourcing", we understand an outsourcing process the driving force of which are not differences between single firms, but between entire countries. Such international outsourcing takes place because countries differ in their factor prices, mainly in their wage levels, such that firms might want to move production to these countries to reduce their production costs.² This phenomenon has caught the interest of trade economists, who have applied conventional models of international trade to explain the surge in international outsourcing. These studies' principal interest is on the impact of trade on employment and wages, mainly of low-skilled workers in industrialized economies.

The majority of the literature applies the Heckscher-Ohlin trade model (also known as the factor-proportions theory). Highly simplified, the model's reasoning is this: Let two countries be endowed with skilled and unskilled labour in different proportions, i.e. one country is skill-abundant while the other is skill-scarce. In autarky, wages are determined by the proportions of the different types of labour in the respective country alone, i.e. taking a skill-abundant nation, unskilled labour will receive a (relatively) high wage because it is (relatively) scarce, and vice versa in a nation with

² This type of international outsourcing is often referred to as "offshore sourcing" or "offshoring".

a relatively unskilled labour force. However, if the two nations can trade and are able to exchange their goods, unskilled labour becomes less scarce in the skill-abundant nation because it can “import” unskilled labour embodied in the goods imported from the skill-scarce nation. Thus, although factors of production might be immobile, trade makes them indirectly mobile via the goods in which their labour is embodied. For the skill-abundant country, this process causes the wage gap between skilled and unskilled labour to widen, while the opposite happens in the skill-scarce country. Under certain conditions, the equilibrium outcome predicts that the same wage structure prevails across the world (factor-price-equalization). It should be noted that the factor-proportions-theory is not undisputed. Some restrictive assumptions are needed to reach the extreme result of complete factor-price-equalization: identical technology and tastes, absence of scale effects, and incomplete specialization (all countries produce at least some amount of all traded goods).

In recent years, a number of models have been developed that relate the Heckscher-Ohlin model to international outsourcing. These models weaken the rigid assumptions necessary for complete factor-price equalization by explicitly accounting for specialization of trading countries, increasing returns to scale or transportation costs. Moreover, they also model trade in intermediate goods, which is closer to the notion of outsourcing than trade only in final goods.

Building on a Heckscher-Ohlin model, Feenstra and Hanson (1996) assume that one final good is produced with a large number of intermediate goods. Factor endowments are allowed to differ sufficiently between different countries, i.e. factor prices do not converge completely and countries specialize in the production of certain intermediate goods. If one region is well-endowed with skilled labour, whereas the other region is abundant in unskilled labour, there will be a critical level of skill-intensity in the production of intermediate goods that divides the production structure of the two regions. Outsourcing is understood as foreign investments, i.e. the movement of the capital necessary for production of a certain fragment. If capital flows from the skill-intensive to the less skill-intensive region, the dividing critical level of skill-intensity decreases, such that products at the lower end of the skill-intensity scale are outsourced from the skill-abundant to the skill-scarce region, where they appear at the high end of skill-intensity. Through this shift, outsourcing

increases the skill-intensity and reduces the relative demand for unskilled workers in *both* countries. Thus, the assertion that outsourcing to less developed countries hurts low-skilled workers in industrialized countries is supported by the theory, but it does not mean that the reverse has to hold in the insourcing country.

Other models predict that outsourcing can also alleviate the problem of diverging wages. While Feenstra and Hanson (1996) focus on the factor-bias of outsourcing, Arndt (1997, 1999) emphasizes the possible sector-bias of outsourcing by allowing for more than one final good. Using a standard model of trade, he looks at small, open economies in which the prices of final goods are determined on world markets. If an industry can reduce production costs by sourcing out a single fragment of its final product, it gains competitiveness and will expand production. The benefits will accrue to the factor that is intensively used in the remaining fragments of the final good compared to the rest of the economy. If, for example, a textile producer (on average not skill-intensive) sources out the least skill-intensive fragment of a shirt production, saves costs and gains a competitive advantage on the world market, this will benefit unskilled labour in its home country. Generally, outsourcing of production fragments has different effects depending on the factor intensities of the final product. Thus, there is no clear effect of outsourcing on the labour demand for unskilled workers in industrialized countries.

Deardorff (2001a) also considers a Heckscher-Ohlin model with different final and intermediate goods. If trade in final goods were sufficient to equalize factor prices and disintegration was costly, no outsourcing would occur. Therefore, outsourcing can only arise in a situation in which factor prices differ initially (e.g. due to complete specialization in final goods). Since the production of any final good might comprise fragments that are intensive in the country's scarce, i.e. expensive, factor, these fragments can be sourced out profitably. Such outsourcing allows production to become more diversified and, if it enlarges the sets of feasible factor uses enough to accommodate endowment differences across countries, can lead to factor-price-equalization.³

³ On the other hand, if outsourcing does not cause factor prices to converge completely, one cannot conclude that outsourcing a single fragment does at least cause partial convergence. In fact, Deardorff (2001b) shows in a follow-up study that outsourcing of single fragments might also lead to a divergence of factor prices.

Since Heckscher-Ohlin models often yield ambiguous results, Kohler (2001) applies a specific-factors model to analyse outsourcing. Capital is assumed to be sector-specific, while labour can easily switch between sectors. If outsourcing takes place through foreign direct investment (FDI), capital goods specific to the outsourced sector move physically to another country. If such outsourcing is driven by low foreign wages, it unambiguously depresses the domestic wage. As capital leaves the economy, workers have to switch to other sectors where the additional labour supply depresses the wage. Obviously, this happens independently of the factor intensity of the outsourced component. The case looks somewhat differently if capital cannot leave the economy, i.e. outsourcing takes place through arms-length transactions between the two countries. Since the total factor endowment stays constant in each country, the factor-intensity of the outsourced component is decisive for factor prices. If a fragment is sourced out which is more capital(labor)-intensive than the domestic average, the demand for labour rises (falls) and wages increase (decrease).

The quick glance at the theory has shown that it is conditioned by restrictive assumptions and often leads to ambiguous results. It is therefore difficult to draw clear and generally applicable predictions about the labour market effects of outsourcing.

For domestic outsourcing, the theory tends to predict rising (aggregate) labour demand. If firms disintegrate because the main reason for their integration – asset specificity – has ceased to exist, they can save the administrative costs of integration and reduce their (combined) production costs. Outsourcing lowers the combined production costs of both the outsourcing and outsourced firm and thus increases the productivity of an economy. Thus, its effects are analogous to technological progress. If this cost reduction is passed on to consumers through lower prices, this will create additional demand either for the final good of the two firms or for other firms' products. In a competitive labour market, labour demand will increase to serve the additional demand, even if not in the same firm. The stimulated aggregate labour demand can be observed in higher wages, higher employment, or a combination of both.

The case is, of course, somewhat different if outsourcing does not increase the firm's (technical) productivity, but is mainly meant to weaken union power. The explicit goal of such a policy is to reduce wages in the firm. If it is successful, one should observe falling wages in the firm, while employment possibly increases.

The labour market effects of international outsourcing are also theoretically ambiguous. First of all, firms might outsource internationally for the same reasons as they could domestically, and we would not expect to see any different effects from it. This effect should prevail mainly in outsourcing activities between economically similar countries. If outsourcing is motivated by international differences in factor prices, trade theory generally predicts that a country's scarce factor loses if the production of a good that is intensive in this scarce factor is outsourced. This means that labour, especially unskilled labour, is mainly hurt by international outsourcing to less capital/skill-rich countries. In some cases, however, the opposite might be true, e.g. if a labour-intensive industry becomes internationally more competitive by sourcing out part of its production, it might raise the demand for labour in the capital-abundant country.

3. Review of empirical studies

Since the theoretical ambiguities do not allow to draw clear conclusions, we will have to consider empirical investigations that might help us determine which effects dominate in real-world economies. This section shall give an overview of such empirical studies.

3.1. The impact of outsourcing at the firm level

Despite the recent interest in the subject, very few studies have attempted to examine outsourcing at the firm level. One of the few exceptions is Abraham and Taylor (1996), who attempt to empirically support different hypotheses about firms' reasons to outsource: first, outsourcing saves wage and benefit costs, second, subcontracting can help smoothing the work load of the regular workforce, and third, outside suppliers might make use of economies of scale. Abraham and Taylor

(1996) use data from the US Industry Wage Survey (IWS) which contains specific information on the subcontracting behaviour of 2,700 firms between 1979 and 1987. The study finds that firms with a high wage level (approximated by the average wage paid to workers in a certain skill category) outsource significantly more low-skilled jobs (e.g. janitorial services) to decrease their wage bill. On the other hand, low-wage firms are found to outsource high-skilled services such as accounting. It is surprising that this effect also occurs in non-unionised firms, as one could expect that such firms are able to adjust their wages to those of potential subcontracting firms. Abraham and Taylor (1996) explain this phenomenon by equity considerations: since high dispersion of wages inside the firm would harm the work climate, businesses tend to outsource activities which fit least in their general wage structure. Moreover, there is no effect of unionisation (besides their impact on wages): even though union work rules function like higher labour costs and encourage outsourcing, stronger unions often influence management decisions and can prevent job from being outsourced. Cyclical product demand does not necessarily cause more outsourcing. As Abraham and Taylor (1996) find, anti-cyclical tasks (e.g. janitorial and machine maintenance services) are less often subcontracted, as the regular workforce can complete these tasks in off-peak periods. Furthermore, firms in metropolitan areas are found to outsource more, which supports the “economies of scale in matching”-hypothesis.

Besides the determinants of firms’ outsourcing decision, also its effects on productivity and profitability have been examined empirically. A number of case studies (Dritna 1994, Lacity et al. 1996) have found that managers typically overestimate the benefits of outsourcing and underestimate the associated transactions costs. The opposite result is obtained by Roodhooft and Warlop (1999), who conduct a field experiment with managers of health care organizations. They find that managers are quite aware of the transactions costs associated with asset specificity. Moreover, their experimental results show that managers exhibit a sunk costs bias in outsourcing decisions. Instead of only taking into account future profits, the mere fact that investments for in-house production have been undertaken in the past causes managers to abstain from outsourcing. Here, the conservatism of managers results in an under-engagement in outsourcing.

Which of these effects is more important has to be determined at a more aggregate level. Görzig and Stephan (2002), using data on 43,000 German manufacturing firms over the period from 1992 to 2000, find that outsourcing generally raises firms' efficiency, as measured by the return per employee. However, the effect on profitability is ambiguous. While increasing material inputs relative to labour costs typically results in better firms' performances, the outsourcing of services leads to lower profit margins. The authors presume that the difference is caused by the easy observability of product quality in competitive material input markets as opposed to the market for services where quality is much harder to monitor etc. Görzig and Stephan (2002) take these findings as evidence that firms have overengaged in the outsourcing of service jobs. Similar results are obtained by Görg and Hanley (2003) in their study of the Irish electronics sector.

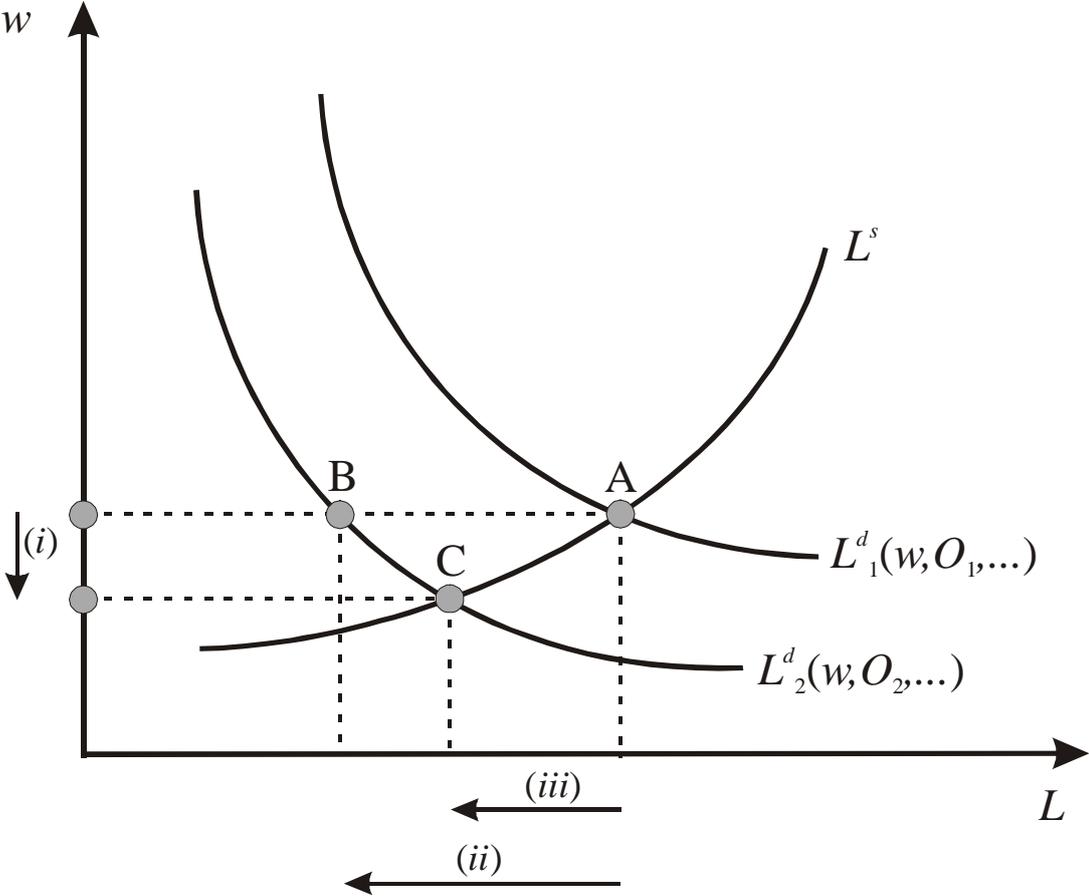
3.2 International outsourcing and its impact on the labour market

Contrary to the relative scarceness of firm-level studies, empirical research on international outsourcing has taken off strongly since the 1990s. These contributions attempt to identify the causes of the growing gap between skilled and unskilled labour, either manifested in wage inequality or in unemployment. One important difficulty is to disentangle the impact of international trade and the impact of technological progress.

The common denominator of recent analyses is the estimation of the impact of outsourcing on *heterogeneous* labour qualifications. We try to present a selected but representative survey of the literature by grouping the contributions into three topics: (i) those studying the effect of outsourcing on wages, (ii) those quantifying the impact of outsourcing on labour demand (for given wages), and (iii) the "equilibrium" approach estimating the total impact of outsourcing on labour input. Figure 1 below sketches the three types of transmission from imports to labour demand and wages. Labour supply, represented by the upward sloping curve L^s , is not affected by outsourcing, but labour demand L^d shifts downwards when outsourcing increases from O_1 to O_2 , so that for the initial wage level, fewer workers are now needed in the outsourcing production unit (this explains the transition from

point A to B, see arrow (ii)). When wages adjust in response of excess labour supply, the increase in outsourcing translates into a negative impact on wages (see arrow (i)). This decrease in wages stimulates employment, which shifts from point B to point C. This conjugated adjustment in wages and employment leads to the new equilibrium point C and the shift from A to C characterises the “equilibrium” approaches to outsourcing.

Figure 1: The impact of outsourcing on labour demand and wages



Aggregation of labour demands over all production units gives the impact of outsourcing on the whole economy. Since outsourcing also creates jobs in the sub-contracting firms, only delocalisation to foreign firms is expected to exert a significant negative impact on aggregate (national) labour demand.

Recent empirical studies do not only try to measure shifts in labour demand and wages due to outsourcing, but also to compare these impacts for different qualification levels or educational attainments of workers.

Whereas studies in the early 1990s considered the impact of total imports on wage and employment, Feenstra and Hanson (1996a) recommend to distinguish imports according to their purpose (final consumption versus intermediate material inputs) and notice that only intermediate material inputs can be considered as reflecting outsourcing.

3.2.1 The impact of outsourcing on wages

Assuming that wages are market clearing, as it is the case in Figure 1 (points A and C), shifts in labour demand due to outsourcing translate into shifts in wages. The economic literature on the impact of outsourcing on wages distinguishes between the impact of outsourcing on the *average* wage and on wage *dispersion*. Wolff (2000) reviews this literature for the US. Several empirical contributions are presented in Table 1 below, distinguishing which data (period and country), and which results have been obtained. Most of the contributions regress the wages (or log wages) of different individuals on a variable reflecting outsourcing (for example trade or imports) and several other variables having an impact on wages (education, experience, gender, etc.). This method allows to identify the impact of outsourcing on wages (see arrow (i) on Figure 1).

Some contributions for the UK, the U.S and Germany are overviewed in Table 1. To summarize this literature, there is evidence for a rather small but significant impact of trade and outsourcing on both the wage level and wage inequality. Borjas et al. (1997) for instance attribute a maximum of 11 percent of the growth in the wage differential between skill groups in the US to rising imports.

Authors	Data	Empirical results	Comments
Borjas and Ramey (1994)	Time series data, US, 1964-1991	Imports (of durable goods) increase wage inequality.	Few tests for the adequate choice of alternative explanatory variable.
Borjas, Freeman and Katz (1997)	Three-digit manufacturing data for the US, 1980, 1990 and 1995	A simulation suggests that trade widens wage inequality, but explains only 4 to 11 % of the observed increase in relative (skilled/unskilled) wages. The impact of immigration on relative wages is bigger.	In their model, relative wages depend on relative supply of skilled and unskilled workers, whose changes can be split into immigration and trade contributions. It is necessary to calculate the labour skill intensity embodied in imports and exports.
Geishecker and Görg (2004)	Matched workers/industry panel data, Germany, 1991-2000	A 1%-point increase in outsourcing is found to decrease the wage of less skilled workers by about 7% and to increase wages of more skilled workers by about 3% (the latter effect is not always statistically significant).	The outsourcing variable is either defined as the output share of imported intermediate inputs, or as the output share of imported intermediate input from the <i>same</i> industry abroad.
Taylor (2002)	Cohorts of individuals, UK, 1973-1994	Some evidence that the wages of more educated workers are less affected by globalisation than those of less educated workers. Technology has a larger impact on wages than trade.	Globalisation is proxied by the share of imports in value added. The author controls for education and occupation.

3.2.2 The impact of outsourcing on employment

The impact of outsourcing (or imports of intermediate inputs) on labour demands is usually estimated from a complete system of input demands comprising labour demand functions for different qualifications.

Morrison-Paul and Siegel (2001) examine 450 US manufacturing industries from 1958 to 1989, using a dynamic cost function model and more detailed measures of labour composition and technical change. Their findings support the hypothesis that outsourcing has negatively affected the employment of low-skilled workers, but do not find significant evidence for effects on high-skilled employment. These empirical findings are in line with those of Berman et al. (1994), who also find that the impact of trade on labour demand is limited.

In contrast to studies of US data, the UK has a higher import share from other industrialized countries and a relatively low share of imports from developing countries. Consequently, one would expect total trading in intermediate goods to have a lower impact on the skill structure of employment. This is exactly what Anderton and Brenton (1999) find: total import penetration has not significantly affected low-skilled employment. However, when separately examining imports from low-wage countries, the coefficient of import penetration is statistically significant. For example, in the textiles industry up to 33 percent of the rise in the employment share of high-skilled workers can be explained by imports from low-wage countries. Their results stand in contrast to those found for the UK by Machin and van Reenen (1998) who did not find a significant impact of imports on the skill structure of labour demand. Such empirical contradictions, which are rather frequent, show that the estimates of the shift in labour demand function often are not robust. Better data, but also more specification tests should help to improve our knowledge about the size of the foreign outsourcing impact on labour demand.

Authors	Data	Empirical results	Comments
Morrison-Paul and Siegel (2001)	Panel of 450 four-digit US manufacturing industries for the period 1958-89	Trade and outsourcing are found to decrease low-skilled demand. Trade is found to stimulate the demand for high skilled workers. However, these variables explain less than 6% of the observed shift in employment.	Trade is measured as the ratio of imports to output. Outsourcing is defined as purchased services by manufacturing industries. The determinants of the amount of trade and outsourcing are not studied.
Falk and Koebel (2002)	Panel of 26 two-digit German manufacturing industries for the period 1978-90	For given output, imported material inputs and labour are not substitutes. Domestic and imported materials are substitutes.	The outsourcing and import decision is a function the input prices and output level.
Yan (2004)	Panel of 84 manufacturing industries, Canada, 1981-1996	An increase of the share of imports by 1 % leads to an increase in the relative employment of skilled labour by 4.2%. This impact is greater for low-skilled than for high-skilled industries.	Outsourcing is measured as the share of imported intermediate inputs in value added. The determinants of outsourcing are not studied.
Anderton and Brenton (1999)	Panel of 11 four-digit sectors (textile and non-electrical manufacturing), UK, 1970-1986	About 33% of the rise in the employment share of high-skilled workers can be explained by imports from low-wage countries.	Total imports are taken as the proxy variable for reflecting outsourcing. Domestic intermediate inputs, which are expected to be substitutes to imports, are not considered in the analysis.

3.2.3 The equilibrium impact of trade

Instead of measuring shifts in employment for given wages, “equilibrium” approaches of the labour market also take the wage adjustment implied by increased outsourcing into account in order to assess its labour market consequences. In terms of Figure 1, the equilibrium impact of trade is represented by the shift (iii) from A to C. From a theoretical viewpoint, the implied wage change compensates the initial negative impact of outsourcing on labour demand. Under some regularity conditions on the labour supply and demand functions, Diewert (1981), for example, has shown that the shift from A to C (when wages adjust) is smaller than the distance between A and B (obtained at given wages). This result can be directly seen on Figure 1.

Equilibrium approaches recognize that wages are endogenous, which often requires the use of instrumental variables techniques for empirical investigation. Now, it becomes necessary to model both the labour demand and supply functions simultaneously, or to consider the labour demand function together with the wage formation. The model can then either be estimated from its structural form or from its “reduced form”. This last route has been followed by Revenga (1992), who finds out that in the US, changes in the import price have a large impact on employment and a more limited impact on wages. A similar result has been obtained by Hakura (1997) using US data for the period 1980-1990. However, the empirical results are not often statistically significant in this latter study.

One drawback of these studies is that they focus on employment and do not consider the different qualifications of workers explicitly. This question has been tackled by Harrigan (1998) and Harrigan and Balaban (1999), who investigate the impact of trade on different qualifications of US workers. However, they find no evidence for a significant impact of trade on wages and relative wages. Such an empirical finding is, however, not consensual. Using more detailed data for US manufacturing sectors, and defining the outsourcing very precisely, Feenstra and Hanson (1999) find that outsourcing explains 11 to 15% of the increase in the wage share of non-production workers.

For European countries, there are but a few contributions adopting the equilibrium approach.

Authors	Data	Empirical results	Comments
Revena (1992)	38 three-digit US manufacturing industries, 1977-1987	When import prices rise by 1%, employment increases by 0.24 to 0.39% and wages increase by 0.04 to 0.09%. Estimates are mostly but not always statistically significantly different from zero.	Industry-specific labour markets, which are in equilibrium. The author considers the price of imports p_{im} which is crude proxy for international outsourcing (because imports include final consumption goods as well as intermediate inputs).
Harrigan (1998)	Time series for the US economy, 1967-1995	Changes in factor supply and final good prices explain the growing wage differential between skilled and unskilled labour. The import price has a small impact on equilibrium wages and relative wages.	Labour supply is assumed to be independent from the wage (it is vertical on Figure 1) The impact of foreign prices on domestic product prices (which are shown to affect wages) is not considered.
Feenstra and Hanson (1999)	Panel of 447 four-digit US manufacturing industries, 1972-1990	Outsourcing has no impact in the 1972-79 period and accounts for 11 to 15% of the increase in the wage share of non-production workers over the 1979-90 period.	The explained variable is the share of non-production wages to the wage bill. It turns out that it is difficult to say something about employment and wages separately.
Egger and Egger (2003)	Panel of 20 Austrian two-digit industries, 1990-	A 1% increase of imports from central and eastern Europe countries increases the high to low skill labour	The determinants of relative wages are not investigated, but their endogeneity is taken into account for explaining relative employment. The authors also evaluate the

	1998	ratio by about 0.08 to 0.12%.	impact of the variables influencing imports.
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4. Conclusion

In this paper, we have identified the economic rationale for outsourcing and have examined its labour market effects. In our analysis, we distinguish between domestic outsourcing (a firm spins off a fragment of its production process into a separate firm) and international outsourcing (a firm makes use of international differences in factor prices and “offshores” parts of its production).

As we have argued, domestic outsourcing is rather the return to the rule than an exceptional phenomenon in a market economy. Only under circumstances that inhibit market forces to work frictionless, the non-market mode of production inside one firm might be economically desirable. In our view, one of the most important inhibitions of markets is asset specificity and the resulting hold-up problem. However, as industries grow and economies globalise, business relations tend to become less specific, thereby reducing the need for integrated firms. Then, outsourcing occurs as firms return to their most efficient mode of production as separate economic entities.

International outsourcing occurs when firms make use of international differences in factor prices. Most trade models, based on the ideas of the Heckscher-Ohlin model, predict that this will cause factor-price-equalisation. While the whole economy gains, its relatively scarce factor loses. This can be seen as a theoretical explanation for the widening gap between wages and/or employment rates of high-skilled and low-skilled workers in industrialized countries. However, there are also reservations to this simple logic. For example, if a production fragment is sourced out to save costs and make the remaining production more profitable, this might well benefit the low-skilled if the remaining fragments are also intensive in low-skilled labour.

From an empirical point of view, several studies confirm that outsourcing contributes to increasing wage inequality and decreasing labour demand. However, the size of this impact is not robustly estimated. As outsourcing is difficult to measure, it should not be surprising that the estimation of its impact is somewhat imprecise. A further reason for the high variability of the results is the difficulty to

combine equilibrium models and disaggregate economic data. On the one hand, some contributions rely on aggregate data in order to be consistent with economic “equilibrium theory”, but neglect useful information contained in micro data. On the other hand, studies using disaggregate data often are not able to identify the aggregate equilibrium impact of outsourcing, because these are not defined at a disaggregate level. This may provide an explanation for why studies using macroeconomic and disaggregate data often find quantitatively different results.

Beyond these approaches, it seems possible to develop macroeconomic studies that rely on microeconomic data. To us, this seems to be a promising approach for future research, which could yield more reliable results on the impact of outsourcing on labour demand.

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