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FDI and Internalisation:  
A Survey**  
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# **From the Theory of The Firm to FDI and Internalisation: A Survey**

## **Summary**

This paper surveys recent contributions on the Internalisation issue, based on different theories of the firm, to show how the make-or-buy decision, at an international level, has been assessed through the opening up of the “black box” - traditionally explored by the theorists of the firm – and the simultaneous endogenization of the market environment – as in the International Economics tradition. In particular, we consider three Archetypes – Grossman-Hart-Moore treatment of hold-up and contractual incompleteness, Holmstrom-Milgrom view of the firm as an incentive system, Aghion-Tirole conceptualisation of formal and real authority in organisations – and show how they have been embedded in industry and general equilibrium models of FDI to explain the boundaries of global firms.

**Keywords:** FDI, Internalisation, International Economics, Incomplete contracts

**JEL Classification:** F1, F2, L1, L2

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## **1. Introduction**

Recent years have witnessed important changes both in the world economy and in the nature of the firm.

Trade economists agree on the fact that a new feature of globalisation is the dramatic increase in foreign direct investment (FDI) and trade in intermediate goods which, in turn, reflects the new way firms organize their activities.

As Abraham and Taylor (1996), Campa and Golberg (1997), Yeats (2001) have documented, firms in many countries are sub-contracting abroad an increasing range of activities – from product design and intermediate good production, to assembly, marketing and after sales services – meanwhile, the same and other firms have been engaging in FDI, so that already in the 1990s, more than 40 percent of US imports of goods took place within the boundaries of multinational firms (Zeile 1997), and roughly one third of world trade now occurs intra-firm (Antras 2003).

One of the most important changes involves the increasing interconnectedness of production processes in a vertical trading chain that stretches across many countries, with each country specializing in a particular stage of production, rather than manufacturing final goods from start to finish.

“Outsourcing”, “slicing up the value chain”, “disintegration of production” are just a few labels for the same phenomenon of vertical specialisation that pushes modern corporations towards a global structure (Hummels et al. 2001; Feenstra 1998; Feenstra and Hanson 1996).

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Meanwhile, the enterprise itself has become the theatre of a massive reorganization, whose keywords sound like downsizing, decentralisation and empowerment of workers, resulting in flatter hierarchies and new balances inside the firm (Holmstrom and Kaplan 2001); while traditional conglomerates were shaped by ownership of physical assets, modern organisations increasingly recognize the importance of human capital and talent, as the new stakeholders of the firm (Rajan and Zingales 2000).

What accounts for these changes in the world economy, on the one hand, and in the nature of the enterprise, on the other?

Vertical specialisation takes two primary forms since international operations may be organized either “internally” – in wholly owned subsidiaries – or “externally” – under arm’s length contracts with independent local producers: what we call *Internalisation* pertains the choice between Integration and Outsourcing.

In the last 20 years, the literature on Multinational Enterprises (MNEs) has basically developed around Dunning’s OLI framework, which groups the motives to undertake foreign direct investment in three categories: Ownership, Location and Internalisation advantages (Dunning 1993).

The underlying intuition is quite simple: if MNEs were exactly identical to domestic firms, they would not find it profitable to enter the domestic market, due to the high cost of doing business abroad; since FDI indeed exist, it must be the case that multinational firms possess some inherent advantages easily exploitable through direct investment.

Ownership advantages correspond to some product, know-how, reputation or production process to which other firms do not have access: these are called “knowledge-based, firm-specific assets”, they are easily transferred across countries and not-excludable, to a large extent. Location advantages arise when it is profitable to produce directly in the domestic market, rather than producing at home and exporting abroad, due to tariffs, transportation costs, cheap factor prices etc. Internalisation advantages represent the most abstract concept within the OLI framework and generically refer to corporate governance issues, such as the boundaries of the firm.

In a way, we could say that the first two points explain why firms should go multinational, while the third one refers to the entry mode, namely the form of involvement in a foreign country.

The literature on MNEs has first combined Ownership and Location considerations while keeping aside the Internalisation issue<sup>1</sup>.

The early modelling - due to Helpman (1984) and Markusen (1984) and lately extended by Helpman (1985), Helpman and Krugman (1985), Horstmann and Markusen (1987a) - has found more recent application in Brainard (1993), Horstmann and Markusen (1992).

These models share three common features – namely plant-level scale economies, firm-level activity as joint inputs across plants and the presence of tariffs or transportation costs between the foreign and the local firm – and derive a simple conclusion, according to which multinationals are supported in equilibrium when firm-level fixed costs and transportation costs are large, relative to plant-level scale economies; moreover, MNEs are more likely to exist the larger, and the more similar the countries (Brainard 1993).

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<sup>1</sup> For extensive surveys, see Markusen (1995), Barba Navaretti and Venables (2004). As far as we know, no survey exists on the specific topic of Internalisation, while the reader would surely benefit from reading Antras (2004), where several model of FDI and presented in details.

Simulations with countries differing in size, relative factor endowment and technology are shown in Markusen and Venables (1996), leading to the famous “convergence hypothesis”, according to which as countries become more similar, international economic activity is increasingly dominated by MNEs, which displace trade – provided that transportation costs are not very small.

As far as the Internalisation issue is concerned, following Dunning’s intuition, the make-or-buy decision of a multinational is usually explained in terms of costs and benefits of using the market. Internalising typically brings direct cost penalties, because a local supplier would have better knowledge, expertise and cost advantage, with respect to an integrated firm; however, relying on the market may be highly risky due to technology transfer (see, among others: Teece 1977, 1986, Rugman 1986), informational asymmetries (Ethier 1986), moral hazard and defection by the local firm (Rugman 1985, 1986, Horstmann and Markusen 1996), agent opportunism and reputation concerns (Horstmann and Markusen 1987b).

To summarize, the original literature on FDI and Internalisation identified in the dissipation of firms’ intangible assets the main motive for Integration.

Firms’ intangible assets basically belong to two different categories, namely superior knowledge - associated with production process, design of new products, technology, management techniques etc. - and stock of goodwill - associated with the reputation for product quality.

In the first case, the optimal organisational structure depends on the degree of transferability of knowledge capital (see Ethier and Markusen 1996, and later refinements due to Markusen 2001, Fosfuri, Motta and Ronde 2001, Glass and Saggi 2002). Once knowledge has been transferred, the licensee<sup>2</sup> might terminate the deal with the multinational and set up its own product unit. However, designing a contract in such a way as to prevent the agent’s defection may be costly for the MNE, since some rents must be shared with the licensee to make defection unprofitable. The multinational might then prefer to operate with a wholly owned subsidiary.

When knowledge is very easy or very hard<sup>3</sup> to transfer, Integration tends to dominate, while for intermediate levels of knowledge transfer, the MNE decides by trading off the costs and benefits of Integration and Outsourcing. In line with the empirical evidence (Mansfield and Romeo 1980, Mansfield, Romeo and Wagner 1980, Smith 2001), Internalisation is more likely to emerge in firms whose know-how is subject to spillovers, firms that are able to borrow on the capital market at lower costs, and firms dealing with a local counterpart who is fast at learning and moves in a legal environment in which property rights are not adequately protected.

When knowledge comes, instead, in the form of goodwill, and quality is not observable to consumers before purchase, a free-riding problem is likely to emerge, as the licensee does not have the same incentive as the MNE to

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<sup>2</sup> Notice that the theories of Internalisation, based on the dissipation of firm’s specific assets, identify the Outsourcing solution with licensing.

<sup>3</sup> Knowledge is a very particular good: some types of knowledge are very difficult to transfer outside the boundaries of the firm in which they originate, due to their tacit component (i.e. they cannot be fully codified for the general user); some other types are, instead, very easily transferred which raises a fundamental problem of spillover. An example of knowledge of the first type is the human capital embodied in the MNE’s employees, while technology lays in the second type.

preserve and enhance reputation, although he benefits from it (Horstmann and Markusen 1987b). Any licensing contract that tries to transfer all the surplus from the licensee to the multinational would be unfeasible: by skimping on quality, the licensee obtains a positive gain. To avoid free-riding, the multinational firm is thus obliged to transfer some rents to the licensee. In this setting, Integration may help by providing better monitoring over the local subsidiary.

This paper surveys more recent contributions on the Internalisation issue, based on different theories of the firm, to show how the make-or-buy decision, at an international level, has been assessed through the opening up of the “black box” - traditionally explored by the theorists of the firm – and the simultaneous endogenization of the market environment – as in the International Economics tradition.

In our view, this represents an interesting and innovative perspective, with respect to the previous literature, in that the firm – originally taken as given – becomes the centre of the analysis, and its internal hierarchy is carefully explored, and related to the market dynamics.

In particular, we consider three Archetypes – 1) Grossman-Hart-Moore (G-H-M) treatment of hold-up and contractual incompleteness; 2) Holmstrom-Milgrom (H-M) view of the firm as an incentive system; 3) Aghion-Tirole (A-T) conceptualisation of formal and real authority in organisations – and show how they have been embedded in industry and general equilibrium models to explain the boundaries of global firms.

Within each of the three approaches, we first describe the original archetype, in order to provide the reader with the underlying intuition, the key words and the specific terminology; then we consider the application to a context of FDI.

While this is our roadmap, across the burgeoning literature on Internalisation, in presenting the papers within each field, we do not necessarily follow a chronological order, rather we consider each contribution as a further step towards a comprehensive characterisation of firms’ organisational solutions, moving from the simple domestic ownership decision to a more complete formalisation of location and ownership concerns in a unitary framework.

With a few exceptions (Antras 2003; Feenstra and Hanson 2003, 2004), this survey covers only theoretical aspects since, as far as we know, empirical tests have not been performed yet.

The rest of the paper is organized as follows: Section 2 describes the main approach, based on transaction costs, contractual incompleteness and the property right theory of the firm; a simple model is designed, in the spirit of Grossman-Hart-Moore, to capture the hold up mechanism that has been employed in models of FDI. Section 3 groups together alternative theories of the firm – namely Holmstrom-Milgrom and Aghion-Tirole – which are briefly described, and comments their applications to the context of Internalisation; due to the limited number of contributions, within these fields, we decided to keep the discussion intuitive without adding formalisation. Section 4 concludes the analysis and suggests future lines of research.

## **2. Hold up**

In this section, we present the first Theory of the Firm-approach to FDI and Internalisation, based on transaction costs, hold up and contractual incompleteness.

A simple model is designed, in the spirit of Grossman-Hart-Moore (2.1), to summarize the main ingredients that have been employed in industry and general equilibrium models to assess the boundaries of multinational enterprises; whenever extensions or modifications have been adopted, with respect to our stylised formalisation, they will be carefully discussed (2.2).

### **2.1 Archetype 1: Transaction Costs, Contractual Incompleteness and the Property Right Theory of the Firm**

What we call Archetype 1 builds on the notion of transaction costs and contractual incompleteness: formerly spelled by Coase (1937) and lately operationalised by Williamson (1985), these concepts received the first formal treatment in Grout (1984), Grossman and Hart (1986), Hart and Moore (1990), where a *hold up* mechanism was introduced and rigorously modelled.

In an ideal world, the relationship between two parties would be easily governed by a *complete contract*, namely a contract that specifies all the contingencies that may affect the contractual relationship.

Unfortunately such a contract does not exist in reality, mainly because of three reasons (Salaniè 1997):

- *Unforeseen contingencies*, in the sense that bounded rationality may force the parties to neglect some key variables whose effect on the relationship they find difficult to evaluate;
- *Cost of writing contracts*, in terms of time and money, since real world negotiation is a long and complex process which mobilizes managers and lawyers. It must therefore be that, at some point, the cost of taking into account a very unlikely contingency outweighs the benefit of writing a specific clause in the contract;
- *Cost of enforcing contracts*, due to the inability of a third party to verify ex post the values taken by certain variables and eventually settle the disputes that may arise.

Real world is thus the land of *incomplete contracts* turn out to be vague or silent on a number of key features (Tirole 1999) and have gaps, missing provisions or ambiguities (Hart 1995): real word contracts simply provide a starting point for the two parties' relationship, but they need to be completed ex post through renegotiation.

Consider, for example, the economic relationship between an upstream firm, which we call input supplier (IS, he), and a downstream firm, which we label as final good producer (FP, she).

FP has an access to a technology for converting specialized intermediate inputs into final goods: if the specialized inputs are of high quality, final good production requires no further variable cost and simply  $y = x$ , where  $y$  and  $x$  indicate respectively the amount of final good produced and intermediate input employed, while sales revenues are equal to  $R(x)$ , an increasing and concave function ( $R_x > 0$  and  $R_{xx} < 0$ ); if the inputs are of low quality, they cannot be converted into final goods, so sales revenues are zero. FP has two options for obtaining intermediate inputs: it can either manufacture them within firm's boundaries – which we call *Integration* - or buy them from an independent supplier IS – which we call *Outsourcing*.

To capture the idea that the input supplier has a relative advantage in its own activity – namely he is more efficient than the final good producer in manufacturing inputs – we assume that the technology to produce intermediate inputs requires one unit of labour to obtain one unit of high quality specialized component, if this task is performed by IS, while  $\lambda \geq 1$

units of labour are needed when the same activity is done by FP; we further assume that low quality inputs can be produced at a negligible cost, and wage rate is equalized to 1.

Notice that, in our basic framework, IS is the only party that makes a *relation specific-investment*, since intermediate goods are fully tailored to a particular final product; in order to keep the model as simple as possible, in the event of disagreement over the terms of trade, we leave the two parties with no outside option, in the sense that none of them can deal with an alternative partner.

Consider, as a benchmark, the case in which  $x$  is chosen to maximize joint profit:

$$\Pi = R(x) - x$$

The first order conditions, with respect to  $x$ , yield the efficient amount of high quality input:  $x^* = R_x^{-1}(1)$ .

This result can be obtained also in a complete contracts setting, by assuming that IS develops its components and sells them to FP at a unitary price of  $p$ .

In this case, the profits of the two independent firms are given by:

$$\pi^{IS} = (p-1)x \quad \text{and} \quad \pi^{FP} = R(x) - px$$

From profit maximization, we see that  $R_x(x) = p$  and the price  $p$  is set equal to 1, which means that a decentralized complete contracts setting entails exactly the same optimal choice of  $x$  as in the benchmark case.

Suppose, now, that it is not possible to write a contract, covering all the possible contingencies that may affect the economic relation between IS and FP.

In these circumstances, the supplier may fear that, after manufacturing specialized components, the final good producer denies the due payment, claiming that some contingencies, uncovered by the contract, have occurred. The contract is thus renegotiated *ex post* but the bargaining position of the input supplier is extremely weak, because its investment in  $x$  is already sunk at the renegotiation stage, and components have no other use outside that specific relationship. Fearing to be *held up* by the other party, IS tends to under-invest, producing a quantity of input lower than  $x^*$ .

If contracts are complete, the allocation of property rights only matters for distributive purposes; if contracts are, instead, incomplete, who owns what is a crucial point, in order to take actions whenever an unforeseen contingency occurs. The essence of the Property Right Theory of the Firm is that ownership of physical assets, by determining residual control rights, entails important economic implications, and affects the two parties' incentives to invest, as we show below<sup>4</sup>.

Suppose that the input supplier's relation-specific investments is *non contractible*, in the sense that a price for intermediate goods cannot be set *ex ante*.

In order to see how contractual incompleteness eventually distorts the benchmark result, we model a game in four steps (Fig. 1): 1) FP

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<sup>4</sup> This approach, based on Grossman and Hart (1986) has been criticized for focusing exclusively on the incentives of top executives to make relation-specific investments. Hart and Moore (1990) develop a property-right theory of the firm in which ownership of physical assets affects the incentives of workers, while a more theoretical literature has formally studied the foundation of incomplete contracts (see Maskin and Tirole (1999), Segal (1999), Hart and Moore (1999)). An interesting extension of the G-H-M framework is due to Legros and Newman (2000), where ownership is defined by residual control rights however, rather than focusing on hold up, a complete contract approach is taken to show how organisations are designed in a competitive economy.



decides whether to internalise input production (Integration) or to outsource it to an independent firm (Outsourcing); 2) production of  $x$  intermediate goods takes place; 3) the two parties meet and discuss over the terms of trade: if they agree, revenues are split according to Nash bargaining, where the weights are given by  $\omega \in [0,1]$  for the input supplier and  $(1-\omega)$  for final good producer<sup>5</sup>; if they do not agree, since none of them has an outside option, they earn zero 4) production and sale of final goods occur.

Figure 1: The timing

1)	2)	3)	4)
Integration vs Outsourcing	production of intermediate inputs	ex post bargaining: the firms meet and choose how to split the revenues	production and sales of final goods

The model is solved by backward induction.

First of all, consider stage 3: if IS and FP operate separately and they reach an agreement, their shares of surplus are given by:

$$\pi^{FP} = (1-\omega) R(x)$$

$$\pi^{IS} = \omega R(x)$$

In stage 2, IS chooses  $x$  in order to maximize  $(\pi^{IS}-x)$ . First order conditions are given by:

$$\omega R_x(x) = 1$$

which means that the optimal investment by the input supplier, under Outsourcing (O), is  $x^O = R_x^{-1}(1/\omega)$ . Given that  $\omega \in [0,1]$   $x^O < x^*$ , the extent of under-investment crucially depends on the bargaining strength of IS: the weaker his position – lower  $\omega$  – the lower the amount of components produced.

At stage 1, the final good producer chooses the organisational form by comparing  $\Pi^{FP} = (1-\omega) R(x^O)$  with the profit  $\Pi^I$  that it would obtain operating as an integrated firm.

Notice that, in this case, FP would keep the entire revenues  $R(x)$  but she would carry higher cost of producing intermediate inputs, due to her lower efficiency with respect to IS.

By maximizing  $\Pi^I = R(x) - \lambda x$  with respect to  $x$ , we obtain:

$$R_x = \lambda \text{ and, thus, } x^I = R_x^{-1}(\lambda)$$

The optimal amount of intermediate goods, under Integration (I),  $x^I$  is a decreasing function of  $\lambda$ : the more the cost advantage of IS with respect to FP, the less appealing the Integration solution; when, instead, an integrated firm is as efficient as a specialized input supplier, in manufacturing components, Integration provides a solution to under-investment in  $x$ .

By substituting  $x^I$  in the profit function of FP, we find that:

$$\Pi^I = R(x^I) - \lambda x^I$$

At stage 1, the final good producer decides to internalise input production if  $\Pi^I \geq \Pi^O$ , while she outsources the same activity if  $\Pi^I < \Pi^O$ .

<sup>5</sup> Here we stick on a basic formulation in which Nash bargaining occurs only under Outsourcing; notice, however, that hold up concerns have been originally modelled also within an integrated firm (Grossman and Hart 1986, Hart and Moore 1990)

From the previous discussion, it should be clear that the boundaries of the downstream firm are shaped by a trade off between governance costs – captured by  $\lambda$  - and transaction costs – related to  $\omega$ .

By the envelope theorem,  $d\Pi/\lambda = -x^1 < 0$ , and  $d\Pi/\omega = -R(x^0) < 0$ : other things being equal, an increase in governance costs, making an integrated firm more and more inefficient, pushes towards Outsourcing, while an increase in the bargaining position of the input supplier, resulting in a lower profit for FP under Outsourcing, tilts the ownership decision in favour of Integration.

## 2.2 From Archetype 1 to FDI and Internalisation

The previous discussion of what we called Archetype 1 served the purpose of illustrating, in a few words, the mechanism underlying the models that will be presented in this Section.

Feenstra and Hanson (2003) consider firms' *international ownership decision* to undertake *FDI* versus *International Outsourcing* in terms of managerial incentives and property rights. Their paper is intended to capture the motivations underlying Export Processing Operations (EPO) in China<sup>6</sup>, which played a major role in the 1990s, accounting for more than 50 per cent of total exports from China.

Two alternative models of EPO – one based on the Grossman-Hart-Moore framework, the other one designed in the spirit of Holmstrom-Milgrom – are built, and testable predictions - whose relevance is explored through econometric analysis - are derived.

In what follows, we focus on the property right model, while postponing the other one to Section 3<sup>7</sup>.

Consider the economic relation between a multinational firm (f) and a local firm (g), linked by export processing operations.

Production of final goods requires intermediate components – that can be purchased by either of the two firms – and takes place within the local factory, under Integration or Outsourcing.

This setting entails an important peculiarity, with respect to the simple model sketched in Section 2.1, and the more complete characterisations of the make-or-buy decision that will be discussed later in this section, and in Section 3. Here, in fact, production of final goods is exclusively due to g, and inputs can be supplied by either of the two parties, while elsewhere assembly is due to the multinational, and inputs are either produced within firm's boundaries or bought from an independent supplier.

Organizational forms ( $d_1, d_2$ ) result from the intersection of two dimensions: who owns the factory – captured by the parameter  $d_2 \in \{0, 1\}$ , with  $d_2 = 0$  if f owns (FDI), and  $d_2 = 1$  if g owns (Outsourcing) - and who controls input purchase – denoted by  $d_1 \in \{0, 1\}$ , with  $d_1 = 0$  if f controls (pure-assembly regime), and  $d_1 = 1$  if g controls (import assembly-regime).

Notice that export processing operations require effort investments by both parties, in order to find cheap inputs (e1), prepare the processing factory (e2), and marketing final products (e3); by assumption, e3 rests with f, e2 rests with g, while e1 lies with either of the two parties, depending on the assembly regime.

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<sup>6</sup> Under this arrangement, firms import parts and components from abroad, process these inputs into final goods, and then export the final products (Feenstra and Hanson 2003).

<sup>7</sup> Feenstra and Hanson (2004) combine both aspects in a single model, which will be discussed in Section 3.1.2.

The timing is as follows: 1) the multinational makes the decision on who owns the factory and who controls input purchase; 2) effort investments  $e_1$ ,  $e_2$  and  $e_3$  are made; 3) input purchase and processing take place, and final goods sales follow.

Contractual incompleteness governs the relationship between  $f$  and  $g$ , and the two parties divide the ex post surplus through Nash Bargaining, with weights  $\omega \in [0,1]$  for the local firm and  $(1-\omega)$  for the multinational.

Notice that Feenstra and Hanson (2003) extend Archetype 1-model by giving the two parties an outside option – dependant on the organisational form  $(d_1, d_2)$  – in case of disagreement; in addition, asset specificity is relaxed, in the sense that inputs controlled by either party can be utilized at the same cost in another factory, but efforts are only partially transferable when the relationship breaks down.

Call  $W_{d_1, d_2}(e_1, e_2, e_3)$  the total surplus of the project, depending on the efforts exerted by the two parties, when the organizational form  $(d_1, d_2)$  is chosen; Feenstra and Hanson (2003) show that  $W$  is submodular, namely  $W_{0,0} + W_{1,1} < W_{0,1} + W_{1,0}$ , therefore, in this framework, it is often optimal to split ownership and control between the local firm and the multinational.

We believe that one of the main achievements of this paper lays in the empirical analysis, since the G-H-M literature accounts just for a few attempts at testing theoretical propositions with real world data (see Baker and Hubbard (2001), Whinston (2001) for a survey of empirical works).

The modularity of the surplus function cannot be tested directly, because we do not observe the value of surplus from outsourcing activity – while we observe the processing exports related to each organisational form – so the authors follow Whinston (2001) and move to a simple stochastic specification, by assuming that ownership and control are chosen to maximize  $W_{d_1, d_2}$  plus an i.i.d. error term, that varies across contractual arrangements.

Empirical evidence, based on data from the Customs General Administration of the People's Republic of China, strongly supports Feenstra and Hanson (2003) theoretical predictions, showing that ownership and control tend to be shared between a foreign firm – that typically owns the Chinese factory – and a local firm – that typically controls input purchase.

We decided to start our review of Archetype1-based models with this paper because, although very recent, it assesses the make-or-buy decision of a multinational firm in a very basic way, neglecting important aspects that have been embedded in richer models. Notice, for instance, that the international dimension of the analysis is completely taken as given, without any attempt at building an industry or general equilibrium model, nor at considering a multi-agent setting: what the authors do, here, is just to design a theory of the firm model, where the comparison between FDI and International Outsourcing, instead of *Domestic* Integration and *Domestic* Outsourcing, simply arises from the fact that a *foreign* and a *local* firm are involved, by assumption.

In the seminal contribution by Ethier (1986), the Internalisation decision is instead endogenized in a general equilibrium framework of International Trade, where a firm's choice of internalising certain activities is explained in terms of information exchange between two agents. Although not explicitly related to the literature on incomplete contracts and hold up, this represents an important predecessor in that informational and transaction concerns are

clearly spelled and their implications on the contractual agreement are rigorously derived.

Some decades after this early intuition, McLaren (2000) makes the first attempt to extend the contractual incompleteness framework - to allow for multilateral relations among agents - and embed Archetype 1 tools in an industry equilibrium model where the *ownership decision* of firms - Integration versus Outsourcing, at a domestic level - endogenously emerges as an equilibrium outcome<sup>8</sup>.

While microeconomic models, summarized in Archetype 1, simply considered the link between a single producer and a single potential supplier, neglecting the interdependence among firms operating in the same sector, in McLaren (2000), all firms' entry, contracting and pricing decisions are optimal, given the choices made by the others; this leads to a simple feedback mechanism in which a firm's choice, by affecting the market conditions, influences other firms' decision about the organizational form.

This paper is specifically designed to assess the impact of globalisation on vertical integration, that is shown to be replaced by downsizing and outsourcing, as long as international openness increases.

Consider an industry composed of  $n$  downstream firms (FP, using our previous terminology) producing final goods, and  $n$  upstream firms (IS), manufacturing specialized intermediate components. Each FP may use, at most, one input, and each IS may produce, at most, one component; moreover, input suppliers may decide whether to manufacture components that are fully tailored to a particular final product - which is called *maximal specialisation technology* - or flexible ones - under a *flexibility technology* - that may be easily employed for alternative uses.

Fully tailored components allow final good producers to reduce variable costs by 1; within the flexibility technology, an input is "effective" - with probability  $\rho$  - or "dud" - with probability  $(1-\rho)$ : in the first case, there is a cost reduction of  $e$  for the intended user, and of  $d$  for an alternative FP; in the second case, there is a reduction of  $e'$  for the intended user, and of  $d'$  for an alternative one, with  $d' < d < e' < e < 1$ , by assumption.

With a slight modification, with respect to Figure 1, the model is organized in three stages: 1) merger; 2) intermediate goods production; 3) market exchange.

In the initial merger stage, each FP is given the option of making a take-it-or-leave-it offer to an input supplier: if the offer is accepted, the two firms become integrated, with IS producing inputs according to the expected profit maximizing-technology; this solution is assumed to be characterized by high governance costs, as usual; if, instead, the offer is not accepted, FP and IS work independently and, due to contractual incompleteness, they cannot

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<sup>8</sup> A similar extension of the G-H-M framework to multilateral relations is due to Bolton and Whinston (1993), where a single upstream firm may interact with a multiplicity of downstream firms to sell its product, but the industry structure is exogenous. This setting yields a new complication in terms of firm's scope: when a number of buyers rely on a single source of supply, shortages may make the input supplier only able to satisfy some buyers. The supply insurance concern thus provides a motive for vertical integration. In Kranton (1996), market and non market transactions are compared as alternative ways of obtaining intermediate goods: in the first case, FP deals with a generic supplier, in the second one, inputs come from a specific IS, either within firm's boundaries or through *reciprocal exchange* - namely an informally enforced agreement to obtain goods or services in exchange for future compensation in kind. In particular, personal transactions are shown to dominate when suppliers produce inputs specific to a buyer, and the two firms repeatedly interact.

write an ex-ante contract, governing the exchange of intermediate components.

In the second stage, input suppliers decide over the technology to be adopted, they make a relation-specific investment and manufacture intermediate components: once the inputs have been produced, IS-firms bring them to the open market – at stage 3 – where final good producers place bids on components offered by different input suppliers, and intermediate goods are sold to the highest bidder. Notice that this timing allows for a potential hold up problem for the upstream firm, because its investment in manufacturing components is already sunk at the market stage. The standard trade off between governance and transaction costs, sketched in Section 2.1, applies also in this richer context, however an important element of novelty is introduced here, as a result of the new multilateral relation-setting: the outside option probability of an input supplier – i.e. the probability of finding an alternative user for its components – increases as long as the number of non integrated firms, within the same sector, increases, adding a mechanism of interactions among firms that could not be captured in a simple bilateral framework.

This *market thickness principle* is even reinforced in moving from closed to open economy, because input suppliers benefit from higher probabilities of selling their intermediate goods in a world where final products are immobile<sup>9</sup>, but inputs can be traded across countries.

Grossman and Helpman (2002) provide an alternative extension of the G-H-M framework to allow for multilateral relations among agents, in an industry equilibrium model where the *ownership decision* of firms – Integration versus Outsourcing, at a domestic level – is endogenized.

The timing is extended with respect to Figure 1: a new stage of Search is added, as a result of the endogenization of the industry environment. Since the market is populated by many – not two – agents, they first need to decide whether to enter as vertically integrated firms, specialized input suppliers or specialized final good producers, then specialized firms must look for a partner in order to work; matches occur randomly, and those who do not find a partner exit the market. After specialized firms get matched, the game proceeds as in Section 2.1, along the steps of production of intermediate goods, which requires a relation-specific investment by IS<sup>10</sup>, ex post Nash bargaining, production and sales of final goods.

The trade off between Integration and Outsourcing results, at a first level, in the traditional comparison between governance and transaction costs: according to the assumptions of the model, a vertically integrated firm is less efficient in the production of intermediate goods and entails higher fixed costs – including entry, product design, and the cost of running a larger company; a pair of specialized producers suffers, instead, from transaction costs, due to the contractual incompleteness governing their relationship.

In the basic version of their model, Grossmann and Helpman (2002) make the assumption that intermediate inputs are fully tailored to a particular product, which implies the absence of outside option for both IS and FP and a potential hold up concern by the specialized input supplier. Following the

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<sup>9</sup> Immobility of final goods is assumed to isolate the market thickness principle from the standard product-market competition effect

<sup>10</sup> As in the simple model, sketched in Section 2.1, intermediate goods may be of high quality or low quality; although the latter can be produced at a negligible cost, only the former can be converted into final products.

same mechanism as in Section 2.1, the input supplier foresees its weak position in the ex post bargaining, because its relation specific -investment  $x$  is already sunk at the renegotiation stage, and it tends to under-invest.

Apart from this standard discussion, by endogenizing the industry structure, Grossman and Helpman (2002) are able to capture the impact of a new factor  $\alpha$ , the degree of substitutability among a given industry's final goods, and a more complex influence by  $\omega$ , IS's bargaining power, on the relative prevalence of Integration versus Outsourcing.

The effect of  $\alpha$  is twofold: according to the model, as long as final goods become less differentiated, specialized firms have higher probability of getting matched, which encourages Outsourcing then, depending on some parameters value, an increase in  $\alpha$  may increase or decrease the operating profits of specialized firms, pushing towards Outsourcing in the first case, and Integration, in the second one; therefore, the overall effect of product differentiation is not always the same.

As far as the distribution of the bargaining power between IS and FP is concerned,  $\omega$  affects the relative prevalence of Outsourcing through three channels: 1) an increase in the bargaining power of IS, by increasing the profit share accruing to the specialized input producer, naturally pushes towards Outsourcing; 2) an increase in  $\omega$  also reduces the distortion caused by imperfect contracting and increases the profitability of IS firms, leading again to an O-solution; 3) by increasing the number of intermediate good producers and reducing the number of final good producers, a higher  $\omega$  lowers the probability of matching between specialized firms, thus encouraging Integration. What they show is that for  $\omega$  very small – when incentives for IS are too low – and for  $\omega$  very high – when input producers have little chances to find a partner, because they are too many, compared to final good producers – Integration dominates, while for intermediate values of  $\omega$ , Outsourcing emerges.

In Grossman and Helpman (1999, 2002), an interesting extension of this model is discussed, by removing the crucial assumption that inputs must be fully tailored to a particular final good and allowing for endogenous specialization of components. Now both parties have an outside option and, in selecting input specificity, intermediate good producers trade off the benefits of having a highly specialized component, which is of maximal value to the customer for whom it was designed, with the benefits of a more standard component that, due to its flexibility, is more valuable for alternative uses.

As far as the ownership decision – Integration versus Outsourcing - is concerned, all previous results hold; this new formalisation, however, allows the authors to capture the additional role of  $\beta$ , a new parameter that indicates the importance of input specificity in the industry under consideration. The more sensitive the manufacturing costs to detailed characteristics of inputs, the more costly the inefficiency arising from partial specialization, which tends to reduce the viability of Outsourcing; at the same time, an increase in specificity reduces the equilibrium volume of intermediate goods and enhances the bargaining power of each IS-firm in its bilateral relation with a final producer: this makes entry by specialized input producers more profitable and may push equilibrium towards Outsourcing in cases where costs are highly sensitive to input specifications.

The great novelty of McLaren (2000) and Grossman and Helpman (1999, 2002) is that they provide a bridge between ideas, originally developed in a

context of Organization Theory, and the International Economics setting of industry and general equilibrium, although they model only the domestic dimension of Internalisation.

A further step, towards a deeper understanding of the trade off between FDI and arm's length trade, is made in Grossman and Helpman (2003), where the *location decision* – Domestic versus International Outsourcing – is endogenized in a general equilibrium model.

The crucial assumption that it is too expensive to manufacture components, by a firm itself, rules out the Integration solution but allows the authors to concentrate on the location issue, that was previously ignored.

Outsourcing means more than buying raw materials: in order for arm's length trade to occur, final good producers need to find a partner – as close as possible to their input requirements – and convince the partner to make a relation-specific investment in customisation – i.e. adaptation of components to final goods.

Grossman and Helpman (2003) design a two countries – North and South – two goods –  $z$  and  $y$  – model in which intermediate inputs and the homogeneous consumption good  $z$  can be produced in both countries, while only the North has the know how to assemble intermediate components into final differentiated consumption goods  $y$ , according to a simple technology that requires one unit of customized input to produce one unit of  $y$ .

All final good producers are thus located in the North and they simply decides whether to outsource production of inputs within the same country – *Domestic Outsourcing* – or in the South – *International Outsourcing*.

The game proceeds in three steps: entry, search and bargaining; while stage 1 and 2 simply resemble our previous discussion, stage 3 is worth explaining in a few words, because some elements of novelty are introduced.

Bargaining occurs in two steps: first of all, the parties bargain over the supplier's investment in customisation – i.e. the development of a prototype – and the compensation for the prototype; the more the distance between IS's expertise and the input requirements, posed by FP, the more expensive the customisation<sup>11</sup>. Bargaining over the investment contract is governed by an incomplete contract setting, where IS's investment is only partly verifiable by a Court: differently from previous models - where contracts were simply complete or incomplete – here the *extent* of contractual incompleteness is explicitly captured by a parameter  $\gamma$  - different from North to South – that indicates the fraction of IS's investment verifiable by a third party, reflecting the state of the legal system. Notice that the prototype is valuable only inside the relation, leaving both parties with no outside option in the Nash bargaining. A second stage bargaining follows, and firms discuss over the order contract, namely the quantity and price of an input: this stage is governed by complete contracts because, after IS has sunk his investment in the prototype, the partners have coincident interests and they can therefore write an efficient contract on the exchange of components.

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<sup>11</sup> As in the extension of Grossman and Helpman (1999, 2002), a two-dimensional representation of the space of input characteristics is given along a circle in which all points are input requirements of final producers and expertise of suppliers.

In trading off Domestic versus International Outsourcing, final good producers consider a number of factors, namely country size, search technology, customizing technology and contracting environment<sup>12</sup>.

First of all, the model shows that, as the South expands, its market becomes “thicker” and, other things being equal, its share of world outsourcing grows because firms prefer to search in a thick market, since the probability of finding a suitable partner is higher.

As far as the search technology is concerned, we need to distinguish between two cases: while a worldwide improvement in search technology has no effect on the outsourcing decision, a disproportionate progress in communication, PC usage or else in the South increases international Outsourcing because firms prefer to search in a country where infrastructure for communication are more developed.

Similar results are derived for the customizing technology, that determines a partner’s willingness to undertake the needed investment in a prototype: a worldwide improvement in customizing technology does not affect the location decision, while a disproportionate progress in one country tends to push outsourcing there.

Another crucial aspect is represented by the contracting environment, because it affects firms’ ability to induce their partners to invest in the relation. Improvements in the contracting possibilities in one country increase the relative profitability of outsourcing there and affects the demand for labour by component producers and final producers at a given wage. Grossman and Helpman (2003) show that a global increase in  $\gamma$  favours Domestic Outsourcing, while an improvement in the Southern legal system, while raising outsourcing from the North, may well increase or decrease International Outsourcing.

Although this model cannot be used to study the make-or-buy decision, it represents a crucial step between Grossman and Helpman (2002) and McLaren (2000) – focused on the domestic ownership choice – and the models discussed below, because the international dimension is explicitly delineated.

Grossman and Helpman (2004a) consider the *international ownership decision* – FDI versus *International Outsourcing* - in a general equilibrium framework, under the crucial assumption that it is cheaper to produce components in the South, while final goods are designed and assembled in the North, which rules out any domestic organisational choice.

They build on Grossman and Helpman (2002), as far as the internalisation trade off is concerned, and Grossman and Helpman (2003), for the international dimension modelling and general equilibrium setting.

Following the same reasoning as before, the choice between FDI and International Outsourcing results, at a preliminary analysis, in the standard trade off between governance and transaction costs: a pair of specialized firms is more efficient in manufacturing components, while an integrated firm, by internalising input production, may correct IS under-investment in customisation, in a setting of incomplete contracts.

The timing is the same as in the previous models, and Nash bargaining covers again the two aspects of investment contract and order contract, as in Grossman and Helpman (2003); no party has an outside option because FP

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<sup>12</sup> Notice that this trade off is not resolved through the usual comparison between transaction and governance costs, because final good producers are engaged in a location, not ownership decision.



may approach any supplier, but just one: by assumption, if the negotiation fails, none of the two firms has time to find another partner. Contractual incompleteness, governing the bargaining over the investment contract, is again captured by the parameter  $\gamma$ , which reflects the state of the legal system.

The general equilibrium setting allows the authors to study the effect of a number of key variables – other than governance and transaction costs – on the relative prevalence of FDI versus International Outsourcing.

In particular, they derive mixed equilibria in which some firms outsource to the South, and some other undertake FDI, depending on the distance between IS and FP in the space of characteristics: if the final good producer and the input supplier are close to each other, they are likely to engage in Outsourcing, if they are instead far away, they choose FDI.

They also find that an increase in the productivity advantage of specialized producers  $\lambda$ , an increase in industry size, and a better legal system favour the relative prevalence of Outsourcing, while an increase in the relative wage in the South encourages FDI.

Grossman and Helpman (2004a) provide a rich framework to analyse the make-or-buy decision, explaining why firms should operate a direct investment in a foreign country or simply outsource some activities; however, the international dimension of the choice is completely exogenous, while we could be interested in combining both the ownership and location decision in a single model.

The first attempt at studying these two dimensions together, in a coherent and unitary framework, is due to Antras (2003), where the choice of FDI, with respect to International Outsourcing, crucially hinges on the capital abundance of the supplying country and the capital intensity of the traded input.

The background is represented by the Property Right Theory of the Firm and incomplete contracts – as far as the *ownership decision* is concerned – and Helpman and Krugman (1985) modelling of imperfect competition and product differentiation, for the *location issue*.

While the models discussed so far basically employed the very simple mechanism, sketched in Section 2.1, Antras (2003) introduces a couple of interesting variations that are worth commenting in a few words.

First of all, as in the original spirit of Grossman and Hart (1986), Hart and Moore (1990), Nash bargaining takes place also within an integrated firm; moreover, Antras (2003) introduces a notion of transferability of investment decisions, whose impact on the two parties' outside option is discussed in details.

His intuition is quite simple: if IS's default option is very low, the allocation of residual control rights may not be enough to induce sufficient levels of investment by the input supplier, resulting in a severe hold up problem that may be alleviated if the final good producer contributes to the supplier relation specific investment.

In the model, two sets of differentiated consumption goods -  $y$  and  $z$  – can be produced by means of two inputs – labour ( $L$ ) and physical capital ( $K$ ) – according to a simple technology that employs  $K$  and  $L$  to manufacture specialized inputs  $x_y$  and  $x_z$  which are linearly assembled into final products; by assumption, only high quality specialized components may be used to produce final goods while low quality inputs – although they can be obtained at a negligible cost – cannot be converted into  $y$  nor  $z$ .

These assumptions allow for a richer set of components: while in previous models the only input was labour, here production of final goods requires both L and K, where labour must be supplied by IS but K may be contributed by either of the two parties. This is the essence of the investment sharing mechanism introduced by Antras (2003), and referred to physical capital only, on the base on empirical evidence (see, for example: Dunning 1993, Milgrom and Roberts (1993), Aoki (1990)).

The game is organized in five stages: 1) choice of ownership and decision on who rents capital; 2) K and L are chosen simultaneously and non cooperatively; 3) production of intermediate goods  $x_y$  and  $x_z$ ; 4) generalized Nash bargaining 5) production and sales of final goods.

Differently from previous models, an integrated firm is assumed to be as efficient as a pair of specialized producers: the only difference between the Outsourcing and the Integration case lays in the residual control rights. In the first case, IS is “owner”, in the sense that he has control over the amount of input produced so, if FP fires the supplying firm, she loses also the inputs produced whereas, in the second case, IS is not owner, namely he has no control right over  $x$ , which means that FP may fire the managers of the supplying firm, seizing at least a fraction of his production.

To understand how the model works, in this more complex setting, it is crucial to distinguish between two cases: when the supplier incurs all variable costs, a standard hold up problem emerges and IS’s under-investment is related to the weakness of his ex post bargaining power  $\omega$ ; when, instead, there is investment sharing, a two-sided hold up problem arises because the investment in K is specific to the pair so also FP feels locked in.

In particular, there is an asymmetry between FP and IS in terms of outside option, depending on the ownership structure: while the input supplier has zero outside option whatever the organisational form, in case of Integration, if the two parties do not agree over the exchange, FP secures herself an outside option by firing IS but seizing his production.

By embedding this richer apparatus in a general equilibrium framework à la Krugman and Helpman (1985), Antras (2003) derives two interesting results, from the interaction between comparative advantages and transaction costs minimization: first of all, K-intensive goods – characterized by high cost sharing - are transacted within the boundaries of multinational firms, while L-intensive goods tend to be traded at arm’s length; moreover, transactions from K-abundant countries take place through FDI, while transactions with K-scarce countries are arranged through International Outsourcing. These results find a strong support in the data: by regressing the share of intra-firm imports over total US imports, on industry and country characteristics, factor endowment and factor intensity turn out to be statistically significant in all the different specifications of the econometric model.

Although Antras (2003) makes a preliminary introduction of location issues, his paper still focuses on the comparison between Integration and Outsourcing at an international level, as it is clear from the data used for econometric tests.

The choice of FDI versus arms’ length trade depends, in part, on country characteristics, so we can predict that different organizational forms will prevail in transacting with different countries, according to their K-abundance, but this framework does not allow us to make the last step and explain why a firm should decide whether to outsource or integrate *either* domestically *or* abroad: this step is made in Antras and Helpman (2004)

where location and ownership decisions are endogenized in the same general equilibrium framework.

In their paper, FP firms – located in the North, by assumption – in order to obtain intermediate goods, choose an “organizational form” which consists of an ownership structure – Integration versus Outsourcing – and a location decision – Home versus Foreign - resulting in four alternatives: *Domestic Integration, FDI, Domestic Outsourcing or International Outsourcing*.

The model bases on two strands of literature: Melitz<sup>13</sup> (2003) inspired the location solution, abandoning the representative agent framework and allowing for heterogeneity - in terms of productivity - across firms operating in the same sector, while the incomplete contract background, to analyse the ownership decision, is derived from Antras (2003).

An important novelty is introduced here, with respect to previous models: production of final goods requires two inputs<sup>14</sup> – headquarter services  $h$  and manufactured components  $m$  – each of them controlled by one of the two parties engaged in the economic relation. In particular, input  $h$  can be produced only in the North and only FP firms have the know how to contribute headquarter services, while input  $m$  can be produced in either country, according to a linear technology that employs one unit of labour to obtain one unit of manufactured component; since wage rate is lower in the South than in the North, production of  $m$  is cheaper there<sup>15</sup>. Under these assumptions, final good producers, in the North, supply  $h$  by themselves, but they need to contract with a manufacturer – either in the North or in the South – for the provision of  $m$ .

Antras and Helpman (2004) model a five-stage game based on: 1) entry and simultaneous decisions of ownership and location; 2) search, upon which fixed organizational costs - higher in the North, and in Outsourcing - are paid; 3) production of intermediate goods; 4) ex post Nash bargaining; 5) production of final goods.

As in Antras (2003), Nash bargaining occurs both in case of Integration and Outsourcing, but the distribution of surplus is sensitive to the mode of organization: under an O-form, no party has an outside option - namely if they agree, FP keeps  $(1-\omega)$  and IS obtains  $\omega$  of the ex post surplus, if they do not agree, they have zero; under Integration, the final good producer has a stronger position than the input supplier because, in case of disagreement, she can fire IS, while seizing a fraction of his  $m$  production.

In choosing between Domestic and Foreign suppliers, final good producers trade off the benefits of a lower variable costs in the South, with the benefits

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<sup>13</sup> Melitz (2003) models the relationship between a sector exposure to international trade and its structure and performance, allowing for heterogeneity across firms in the same sector. He finds that the exposure to international trade leads more productive firms to export and less productive firms to exit the market; a further increase in the industry's exposure to trade induces an intra industry reallocation in favour of more productive firms. This explains why international trade may generate aggregate productivity gains without necessarily improving the productive efficiency of individual firms.

<sup>14</sup> In Antras (2003) two inputs –  $L$  and  $K$  - are needed to obtain intermediate goods, but only *one* type of intermediate good - either  $x_y$  or  $x_z$ , depending on the final good - is required to produce final goods; here, instead, *two* kinds of intermediate goods -  $m$  and  $h$  - are needed to be converted into final products.

<sup>15</sup> This assumption means that the technology to manufacture component  $m$  is the same, whatever the ownership structure - as in Antras (2003) – while the only difference in efficiency is “spatial”, because, whatever the ownership structure, producing  $m$  in the South is cheaper than in the North.

of lower fixed organizational costs in the North; in choosing between Integration and Outsourcing, they trade off the benefits of ownership from vertical integration, with the benefits of better incentives for the manufacturer under outsourcing.

Notice that this model is particularly rich in that it considers three lines of heterogeneity: sectors differ in headquarter service-intensity, so that we distinguish between high and low tech industries; firms differ in their productivity level  $\theta$ , and countries differ in terms of organizational and variable costs.

By exploiting these lines of heterogeneity in a general equilibrium framework, the authors come to an important conclusion. In low tech sectors, Integration never occurs: firms with higher productivity outsource in the South, while firms with lower  $\theta$  outsource in the North; in high tech sectors, we may observe any of the four organizational forms: firms with higher productivity buy inputs from the South, firms with lower  $\theta$ , buy inputs from the North; among firms that buy inputs from the same country, higher productivity firms integrate, lower productivity firms outsource.

The degree of productivity dispersion and the headquarter service intensity are shown to be relevant in determining the relative prevalence of alternative organizational forms. In particular, Antras and Helpman (2004) prove that sectors with more dispersion of productivity rely more on imports and, among the high tech producers that acquire inputs in a particular country, the number of integrated firms is higher, with respect to the number of outsourcing firms, the more dispersed the productivity within the sector; moreover, high tech sectors rely less on imports and, among high tech producers that acquire inputs in a particular country, the number of integrated firms is higher, the more headquarter-intensive the sector.

In endogenizing both location and ownership concerns, this paper offers the richest characterization of the organizational choice in the set of models reviewed so far, nonetheless it sheds lights only on the comparison between FDI and some forms of *partnering* – domestically or abroad – without considering a broader menu of contractual arrangements.

Ottaviano and Turrini (2003) introduce outsourcing contracts in an otherwise standard model of multinational firms, based on the proximity-concentration trade off (see, for example: Krugman (1983); Horstmann and Markusen (1992); Markusen and Venables (2000)), in order to explain the decision to undertake FDI or export<sup>16</sup>, in terms of distance and market size.

Production of a differentiated consumption good  $y$  consists of two activities: upstream manufacturing of intermediate inputs, and downstream assembly.

They explicitly rule out the location decision, by considering a local market where final goods are supplied only by foreign firms, which make their organizational decisions in two steps. First of all, they choose whether to export final products to the local market, or to engage in FDI; it is crucial to notice that FDI, in this paper, covers the two possibilities of “self production” and “outsourcing”: in the first case, intermediate components

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<sup>16</sup> FDI and export are treated, here, as substitutes, but it does not need to be the case: in Rob and Vettas (2003), a dynamic modelling is provided to generate the time-paths of export and FDI. Due to demand uncertainty and irreversibility of investments, multinationals are shown to use export, to explore future demand, and lately turn to FDI to supply the products more economically, once demand is known. Notice that uncertainty is introduced also in Hanson (1995), but in a completely different way: Mexican firms are assumed to choose their ownership arrangement (at a domestic level) by trading off the minimization of the hold up risk, under Integration, and the diversification of the natural risk, under Outsourcing.

are manufactured at home by the multinational firm and shipped to local assembling lines – it is the *FDI à la Grossman-Helpman-Antras* – while, in the second case, the multinational firm outsources input production to a local supplier – it is the *International Outsourcing à la Grossman-Helpman-Antras*<sup>17</sup>. Firms that engage in FDI then decide, as a second step, whether to self produce or outsource.

In choosing between export and FDI, final good producers trade off the low governance costs, associated to the first option, with the low trade costs, implied by the second one, resembling the standard proximity-concentration argument: firms invest abroad when the gain from avoiding transportation costs out-weights the cost of maintaining capacity in multiple markets.

In choosing between self-production and outsourcing, multinational firms trade off the low cost of managing distant operations, related to the first option, with the low trade costs of arm's length trade, in a context of contractual incompleteness and double-sided hold up problem<sup>18</sup>.

This arises because both parties make relation-specific investments under outsourcing: intermediate goods, supplied by IS, are fully tailored to a particular final product and FP, by assumption, needs to make a relation specific investment in the assembly line; while the multinational firm has an outside option, in case of self- production, a local input producer has none, whatever the organizational solution adopted in the second stage.

The main result of the model is that trade costs affect both steps of organizational decision: for high values of the trade costs, the proximity-concentration trade off dominates and FDI are chosen when the distance between the home and the local market is large; for low values of the trade costs, the contractual incompleteness trade off dominates: on the one hand, export seems more appealing, on the other hand, the outside option resulting from self production is also strengthened which makes outsourcing more profitable from the point of view of the final good producer.

Ottaviano and Turrini (2003) show that, if market size is large enough, this *outside option effect* may prevail over the proximity-concentration argument, eventually leading to a non-monotonic relation between FDI and distance, in countries with large markets<sup>19</sup>: put another way, foreign direct investments may emerge both for high and low values of trade costs, in line with the empirical evidence.

This paper concludes our survey of Archetype 1-based models and, together with Antras and Helpman (2004), offers the most complete understanding of Internalisation: here a richer set of contractual agreements – export, FDI,

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<sup>17</sup> In both cases, production of final goods is due to the multinational firm and it takes place in the local market: the only difference lays in production of intermediate components, which is due to an independent supplier and takes place in the local market under outsourcing, while it is due to the multinational firm and takes place in the home market, under self-production.

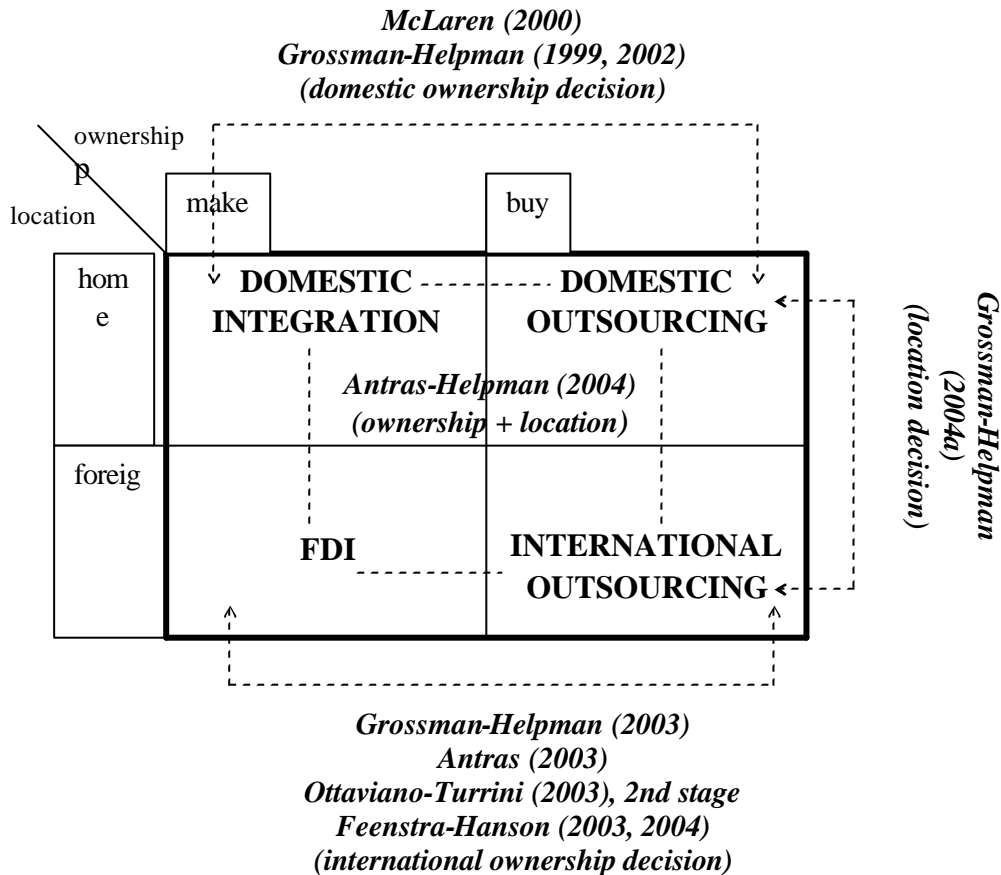
<sup>18</sup> Similarly to Ottaviano and Turrini (2003), Helpman et al. (2004) base on a proximity-concentration argument to explain the choice between FDI and export, through a multi-country, multi-sector general equilibrium model. Instead of depicting an incomplete contract setting, intra-industry heterogeneity of firms à la Melitz is assumed and it interacts with distance in driving the way of serving a foreign market. Only the most productive firms are shown to engage in foreign activities and, among them, only the most productive undertake FDI; the extent of intra-industry heterogeneity is proved to affect the volume of FDI sales over export, both theoretically and empirically. The proximity-concentration hypothesis is employed also in Brainard (1997), and combined with the factor-proportion hypothesis to stress empirically the role of distance in explaining the trade off between FDI and export.

<sup>19</sup> Since the outside option effect is entirely due to the hold up problem, non monotonicity disappears under contractual completeness, as it is shown in the paper.

International Outsourcing – is modelled, while taking as given the international dimension of the problem; in Antras and Helpman (2004), an opposite perspective is adopted because ownership and location issues are combined in a unitary and coherent framework, but just two options – FDI versus partnering with an independent supplier – are considered<sup>20</sup>.

Figure 2 summarizes Archetype 1-based models, according to their specific theme.

Figure 2: Organisational forms in Archetype 1-based models



### 3. Alternative approaches

In this section, we discuss a few models of FDI and Internalisation, based on alternative theories of the firm, in which worker's incentives play a central role in designing the optimal organizational form.

Keeping the same structure as before, we first describe the basic intuition from the underlying theories of the firm - summarized in Archetype 2 and Archetype 3 – then we present models of FDI in which that intuition has

<sup>20</sup> A richer array of choices of international organisations is offered in Grossman et al. (2004): following Yeaple (2003) and Ekholm et al. (2003), they go beyond the traditional distinction between horizontal and vertical FDI (see, for example, Markusen 2002) to account for the evidence that, with many countries and many stages of production, some organizational forms do not fit neatly into either of these categories. This paper is not covered by the present survey because the boundaries of multinational firms are taken as given, and the make-or-buy decision is ruled out from the general equilibrium analysis.

been employed to study the make-or-buy decision, at an international level. Given the limited number of contributions within these fields, we decided to keep the discussion intuitive, without adding formalisation.

### **3.1.1 Archetype 2: The firm as an Incentive System**

Holmstrom and Milgrom (1994) provide an interesting view of the firm - as an incentive system - in response to the limitations of previous theories, criticised for being incomplete and unidimensional.

According to them, the standard make-or-buy decision cannot be fully explained in terms of ownership of assets - as in the Grossman-Hart-Moore framework - *or* monitoring and worker compensation - as in Alchian and Demsetz (1972), Holmstrom (1982) - *or* employer's discretion over his employees activities - as in Coase (1937) and Simon (1951): indeed, a comprehensive analysis of the boundaries of the firm requires a combination of asset ownership *and* contingent rewards *and* job restrictions, because they all have an influence on workers' incentives, and the way they exert effort.

Consider our typical situation in which final good production requires intermediate components: inputs can be produced either internally, by an employee - under the employer's direction, using the employer's tools and being paid a fixed wage - or externally, by an independent contractor who chooses his tools and methods and who is paid proportionally to the quantity supplied. As in Holmstrom and Milgrom (1994), we call the first case *inside procurement*, or employment contract, and the second one *outside procurement* or supply contract: notice that the former resembles Integration, while the latter represents Outsourcing, according to our previous terminology (Section 2).

The authors argue that these two arrangements emerge as a result of two alternative systems for managing incentives, across the wide array of tasks for which a single worker is responsible.

Broadly speaking, firms may use three main types of instruments for each incentive system: 1) asset ownership, which consists in letting an agent own a set of productive assets; 2) contingent reward, according to which workers are paid based on their measured performance; 3) job restrictions, namely the specification of job rules, working hours and similar policies to restrict or enhance workers' freedom from direct control.

Holmstrom and Milgrom (1994) make the crucial assumption of *task substitutability*, according to which workers view the different tasks, for which they are responsible, as substitutes. This intuitively suggests a complementarity link among the three instruments described above: increasing agents' incentives for just one task could cause the worker to devote too much effort on that specific task, while neglecting other aspects of his job, therefore the three instruments should be balanced, to keep the various incentives in balance, as well.

This intuition is formalized in the multitask dynamic principal-agent model set in Holmstrom and Milgrom (1987;1991), where incentive instruments are endogenous variables, and exogenous parameters - such as the cost of measuring performance, asset specificity and uncertainty about the future - are introduced to see whether their variation leads to co-movements in the instruments - in which case complementarity should be confirmed - or not.

The main result of their model - in line with the empirical evidence reported by Anderson and Schmittlein (1984) and Anderson (1985) - is that outside procurement (Outsourcing) tends to be characterized by high powered incentives - namely high asset ownership, high commission rates, more

freedom and more emphasis on direct sales measurement – whereas inside procurement emerges when workers earn a fixed wage and use firms’ tools.

### **3.1.2 From Archetype 2 to FDI and Internalisation**

As we discussed in Section 2.2, Feenstra and Hanson (2003) model firms’ decision to undertake *FDI* versus *International Outsourcing* in terms of managerial incentives and property rights. We have already focused on their G-H-M-based model so, in what follows, we move our attention to the one designed in the spirit of Holmstrom and Milgrom (1994).

Recall the economic situation in which a multinational firm (f) and a local firm (g) are linked by export processing operations; production of final goods requires intermediate components – that can be purchased by either of the two firms – and takes place within the local factory, under either an employment or a supply contract.

Notice that this setting is completely analogous to the one sketched in Section 2.2, so we simply refer to our previous description, as far as the organisational forms and the timing are concerned.

Differently from Holmstrom and Milgrom (1994), where efforts were related to managers only, here  $e_3$  rests with f,  $e_2$  rests with g, while  $e_1$  lies with either of the two parties, depending on the assembly regime; according to the formulation of the problem,  $d_1$  and  $d_2$  are the only instruments to design g’s incentives to exert effort.

The choice on who owns the factory implies the adoption of different contractual arrangements, namely an employment contract, under FDI, and a supply contract, under Outsourcing. In the first case f pays the local firm an amount T, provided that g has exerted effort  $e_2$ , and  $e_1$  if g controls input purchase; by assumption, the multinational can verify efforts only up to some levels  $e_1^{\wedge}$  and  $e_2^{\wedge}$ . In the second case, f agrees to pay g a transfer price T if the local firm delivers one unit of the processed input to the foreign firm.

Call  $W_{d_1, d_2}(e_1, e_2, e_3)$  the total surplus of the project, depending on the efforts exerted by the two parties, when the organizational form  $(d_1, d_2)$  is chosen; Feenstra and Hanson (2003) show that W is supermodular, namely  $W_{0,0} + W_{1,1} > W_{0,1} + W_{1,0}$ , therefore, in this framework, it is often optimal for the same firm to own the processing factory and to control the inputs used in the export processing: ownership and control are proved to be complementary instruments, as in H-M; however, the same empirical evidence, reported in Section 2.2, is strongly inconsistent with this theoretical prediction since export processing operations are shown to be characterized by foreign ownership of the processing factory, and Chinese control over input purchase.

Feenstra and Hanson (2004) make an interesting attempt at *combining* both the property right and the incentive system approach – considered as *alternative*, in Feenstra and Hanson (2003) - in a single model, by assuming that the two parties’ efforts can be verified only with probability  $(1-\phi)$ , so that a first-best contract is enforceable, while with probability  $\phi$  there is no verifiability and no contract, in which case profits are split according to Nash bargaining. By assumption, the two parties’ outside options are decreasing functions of  $\psi$ , which measures the specificity of the human-capital investment by either firm in the project.

In this richer framework, whether ownership and control should rest with the same party or not, depends on some parameter values: when human capital



specificity is low, value added is high and the bargaining weight of the multinational  $(1-\omega)$  is high,  $f$  can ameliorate the hold up problem by transferring input control to  $g$ , whose incentive to make relation specific-investments increases, even if it does not own the local factory; on the contrary, when  $\psi$  is high, value added is low, or  $(1-\omega)$  is low, ownership and control should be given to the same party.

Chinese data support the finding that ownership and control are shared between  $f$  and  $g$ , and this evidence appears even more clearly when the authors consider subsets of data on export through Hong Kong, or that exclude interior provinces.

As we have already stressed in Section 2.2, Feenstra and Hanson make an interesting step in comparing (2003) and combining (2004) different theories of the firm to explain the Internalisation issue, but the international dimension of the analysis is completely taken as given, without any attempt at building an industry or general equilibrium model, nor at considering multi-agent relationships.

This step is achieved by Grossman and Helpman (2004b) who build on Archetype 2, and analyse the emergence of the four *organisational forms* – resulting from the intersection of *ownership* and *location* decisions - as an industry equilibrium outcome.

They model a standard situation in which production of final goods requires intermediate components; by assumption, only final good producers (FP) have the know how to assemble final products, but only input suppliers (IS) have the technology to realize components.

IS supplies inputs either under inside procurement (Integration) - being a division of FP - or under outside procurement (Outsourcing) - as an independent entrepreneur.

Notice that this setting entails an interesting difference, with respect to the models reviewed in Section 2, because input production rests with IS only, and FP, even under Integration, cannot manufacture the needed components by herself<sup>21</sup>.

The inside procurement is characterized by an amount  $s$  that the final good producer promises to the input supplier, whatever happens and an amount  $p_0$  that is paid to the entrepreneur in case he is able to provide the needed components; the external procurement specifies an effort level  $e^*$  that IS is expected to exert on all monitorable tasks, a wage payment  $w$ , irrespective of the outcome of the project, and a bonus  $b$ , received by IS in case the project succeeds.

In choosing between supply and employment contract, final good producers trade off monitoring and cost considerations: since input manufacturing requires effort, Integration allows FP to monitor, at least, a fraction  $\epsilon$  of the tasks for which IS is responsible, while under Outsourcing no monitoring is possible at all; since input manufacturing requires a cost  $c$ , other than effort,

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<sup>21</sup> In Feenstra and Hanson (2003) inputs are not *manufactured*, but *bought*, by either of the two parties, while final good production rests with the local firm, differently from Grossman and Helpman (2004b) and the models reviewed in Section 2. Notice that, among Archetype1 based-models, Grossman and Helpman (2004a) make a similar assumption – by saying that it is too expensive to manufacture components within firms' boundaries - to rule out ownership concerns and concentrate only on location issues; in Grossman and Helpman (2004b), due to the different framework (Archetype2), this hypothesis is completely compatible with a richer characterisation of the organisational decision, where ownership and location are combined.

under Integration,  $c$  is born by FP, while it accrues to IS in case of Outsourcing.

In order to add the location dimension to the previous analysis, the authors distinguish between two countries – the North, where inputs are assembled into final products and the South – and they assume that monitoring is easier in North ( $\epsilon^S < \epsilon^N$ ) and that costs  $c$  are lower in the South ( $c^S < c^N$ ).

In combining ownership and location decisions, as in Antras and Helpman (2004), four organisational alternatives emerge: production of intermediate components may rest with a manager, within the domestic firm's boundaries (*Domestic Integration*), or operating in a foreign subsidiary (*FDI*); alternatively, it may rest with an independent entrepreneur, giving rise to *Domestic Outsourcing*, if he operates in the North, or *International Outsourcing*, if he operates in the South.

Firms heterogeneity à la Melitz is introduced in this setting, by assuming that, upon entry, firms draw a productivity level  $\theta$  from a known distribution  $G(\theta)$ .

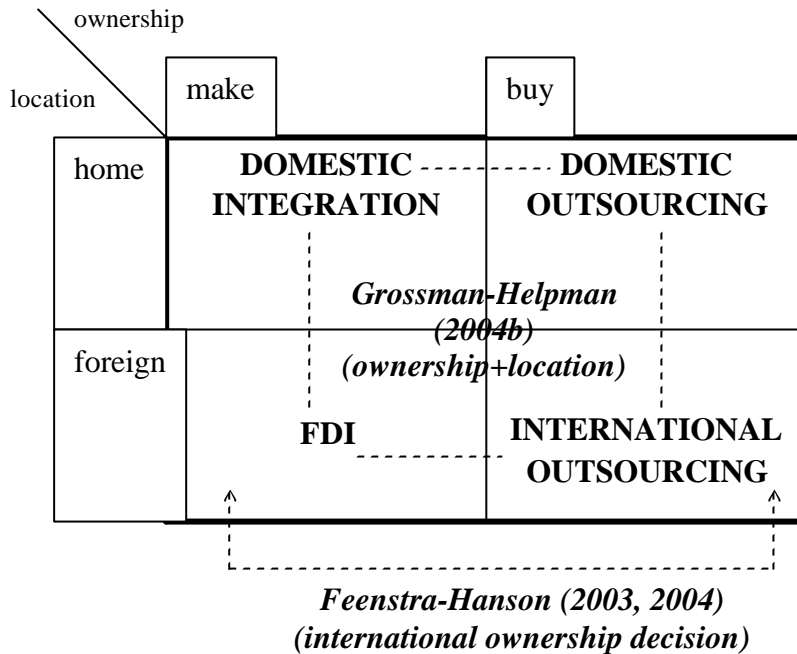
As far as the ownership decision is concerned, Outsourcing is shown to be preferred by the most and least productive final good producers, while Integration emerges for intermediate values of  $\theta$ ; moreover, among firms that integrate, those that decide to keep their divisions close to the headquarter are potentially more productive than those that engage in FDI.

By designing an industry equilibrium model, Grossman and Helpman (2004b) are able to assess the impact of reduced transportation costs and improvements in monitoring in the South on the relative prevalence of different organisational forms. They show that trade liberalisation may boost the prevalence of Outsourcing or FDI - depending on whether the industry is one in which Outsourcing is done by the least or the most productive firms - while improvements in monitoring distant managers result in an increased market share for multinational corporations, and a decline in the market shares of components produced under Domestic Integration and Domestic Outsourcing.

Although inspired by a different theory of the firm, this paper is quite close to Antras and Helpman (2004) since it offers a complete characterisation of Internalisation - as a result of ownership and location concerns - while the link with Archetype 2 appears less tight than in Feenstra and Hanson (2003): even if Grossman and Helpman (2004b) derive the same conclusion as Holmstrom and Milgrom (1994) - because the optimal contract for a potential supplier often provide higher powered incentives, than the one for a manager - this strictly depends on the restrictions put on payments and the assumptions on who bears the input production costs under inside and outside procurement.

Figure 3 summarizes Archetype 2 based contributions, according to their specific themes.

Figure 3: Organisational forms in Archetype 2-based models



### 3.2.1 Archetype 3: Formal and Real Authority in Organisations

Aghion and Tirole (1997)'s famous theory of the firm arises from an interesting re-thinking of the concept of "authority".

In the G-H-M framework, authority originates from ownership of physical assets, giving the owner control rights – or *formal authority* - over decisions concerning the use of her own asset. However, in the real world, formal authority does not necessarily confer *real authority*, namely effective control over decisions.

The separation between formal and real authority, that emerges in Aghion and Tirole (1997), crucially hinges on informational asymmetries between a principal (P, she) and an agent (A, he), who is hired to collect information and potentially implement a project, while congruence parameters measure the extent to which A and P have aligned interests in terms of preferable projects.

Notice that each project entails a verifiable monetary benefit for the risk neutral principal and a private benefit for the risk averse agent.

For each party, at least one project is associated to a negative payoff, so that an uninformed party has no incentive to pick a project at random, rather she prefers to rubber-stamp the informed party's proposal, or do nothing, in case they are both uninformed.

Information acquisition is costly and entails a private cost – different for A and P – which is an increasing and convex function of the effort exerted by the party; P and A are assumed to collect information simultaneously.

In a setting of incomplete contracts - because the allocation of formal authority is the only point that can be set ex ante - two organisational arrangements may emerge, depending on whether the principal or the agent has formal authority: the first case is called P-organisation (Integration, according to our previous terminology), the second one A-organisation (Outsourcing).

The two parties' optimal efforts, in acquiring information, are inversely proportional: the higher the initiative by A, the lower the effort exerted by P and vice versa; moreover, each player is shown to put higher effort when she has formal authority, because she cannot be overruled by the other party.

The choice between P-organisation and A-organisation is thus governed by a trade off between control and initiative: the benefit of delegation lays in the increased effort by the agent, but this comes at the cost of reducing P's control; anticipating this, the principal tends to under-invest in information acquisition.

Notice that this model provides a two-way interaction between authority and information: information acquisition is endogenously affected by formal authority and endogenously affects real authority within organisations<sup>22</sup>.

### **3.2.2 From Archetype 3 to FDI and Internalisation**

Marin and Verdier (2002; 2003a; 2003b) focus on recent stylised facts to explain the enormous changes that globalisation has prompted in the nature of the firm: on the one hand, conglomerates have broken down, and decision making has become more and more decentralized (2002); on the other hand, human capital has increasingly replaced physical capital as the key asset within modern corporations (2003a).

To account for these epochal changes, the authors combine A-T view of the firm, with Dixit and Stiglitz (1977) modelling of monopolistic competition, in a general equilibrium analysis.

In Marin and Verdier (2002), firms' organisational choices – Integration versus Outsourcing - are related to variations in the degree of product differentiation  $\alpha$ .

In the partial equilibrium framework, resembling Archetype 3, decisions are taken according to the following sequence: 1) the principal allocates formal power to herself (P-organisation) or to the agent (A-organisation); 2) the two parties collect information simultaneously; 3) the party who does not have formal authority makes a project proposal; 4) the party with formal authority selects her favourite projects if informed, rubber-stamps the other party's suggestion if she is uninformed, and the other is informed, while no project is undertaken when neither party has information.

The model is solved by backward induction, and the first stage choice between A-form and P-form is crucially driven by Archetype 3-trade off between P's control and A's initiative<sup>23</sup>.

In particular, low profit and high profit firms are shown to opt for a P-organisation, while at intermediate profit levels, the optimal choice switches from P-form to A-form to O-form<sup>24</sup> to A-form.

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<sup>22</sup> Adding to this formalisation, a monitoring view of the firm is adopted in Aghion and Tirole (1995), where the enterprise is considered as a network of core and peripheral units, in order to explore the effects of firms' growth – i.e. increasing scale or scope – on their ownership structure and organisational form. In that setting, growth is responsible for an increase in the principal's overload, raising her marginal cost of acquiring information, and prompting a massive restructuring where A-organisations emerge for those units that are easier to monitor, while the core keeps control rights on the units where it has more expertise or monitoring is harder.

<sup>23</sup> Also Puga and Trefler (2002) build on A-T intuition to develop a model in which incentives play a key role - as in Marin and Verdier (2002; 2003a; 2003b) - and organisational forms result from the intersection of two dimensions - who creates knowledge and who controls knowledge.

Notice that the organisational mode matters for incentives only at intermediate profit levels: at low profits, the principal monitors little because his stake is small, therefore P-form dominates because it gives sufficient incentives to the agent and more power to the principal; a similar reasoning applies to high profits, since P's stake is so large that he would intervene a lot even under A-form, leading to minimum effort by the agent under both arrangements; since the principal has more control under P-form than A-form, he chooses the first option. While no trade off between control and initiative emerges for high and low profits, for intermediate profit levels such a trade off shapes firms' organisational decisions: at the beginning, A-form dominates to give the agent sufficient initiative but, as long as the profit increases, the gains from having an active agent are overcome by the loss of control by the principal, and the O-form becomes the optimal solution.

By endogenising profits through the usual free entry condition, the previous discussion is embedded in a general equilibrium framework to assess the role of market competition  $\alpha$  in designing firms' profits and explaining the choice between Integration and Outsourcing.

Marin and Verdier (2002) show that as long as  $\alpha$  increases, outsourcing and merger waves occur, with firms passing from P-form (Integration) to A-form (Outsourcing) to a single managed arrangement, with no agent, under O-form.

Notice that an equilibrium with Outsourcing emerges, as in Grossman and Helpman (2002), at intermediate levels of competition, but the reason is quite different: here a feedback mechanism arises due to *strategic complementarity* among firms - in the sense that the relative attractiveness of Integration versus Outsourcing depends on the organisational decisions taken by the other players in the market - while in Grossman and Helpman (2002) Internalisation has nothing to do with the trade off between control and initiative, rather it lays on the comparison between governance and transaction costs.

Although inspired by different archetypes, we believe that the two papers have a similar role in the literature on FDI and Internalisation, because they both bridge ideas - traditionally developed within the Theory of the Firm - with a setting of International Economics, where the international dimension is not yet explicitly delineated.

Notice, in fact, that the organisational choice modelled in Marin and Verdier (2002) is nothing but the *domestic ownership decision* studied in Grossman and Helpman (2002): even if we consider changes in the *international* market competition, they are shown to affect the relative prevalence of *Domestic Integration* versus *Domestic Outsourcing* - namely the make-or-buy decision within a given country, not across different states.

In Marin and Verdier (2003a) a new element is added to the previous formalisation, in that the emergence of the *human capital firm* is carefully analysed and its implications on the organisational decisions are derived in details.

Following Rajan and Zingales (2000), the authors identify the main features of the modern enterprise: while traditional corporations were usually large, vertically integrated, and characterized by physical assets, the human capital

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<sup>24</sup> This option, absent in Aghion and Tirole (1997), represents the case in which the principal has formal power, and the agent exerts no effort, differently from the so called P-organisation, in which P has formal authority and A exerts effort.

organisation is defined in terms of human capital and talent, which are responsible for innovation and creation of new ideas. Differently from physical capital - which can be legally linked to the firm through ownership - human capital is inalienable and lays with the persons, who need to be provided with the right incentives not to leave the organisation they work for.

Why has human capital become so important in the last few decades? Marin and Verdier (2003a) identify a novel explanation<sup>25</sup> based on changes in the organisation of the corporations: firms respond to improved opportunities of human capital outside providing incentives for talents to prevent them from leaving their companies.

In particular, they show that trade integration<sup>26</sup> leads to a “war for talent” which is strictly related to the *domestic ownership decision*.

The model bases on Archetype 3, as far as the firm description is concerned, while the trade setting is derived from Helpman and Krugman (1985).

Consider two countries – the North, rich in human capital (H), and South, rich in labour (L) – and two goods – y, which is human capital intensive, heterogeneous and produced under monopolistic competition à la Dixit and Stiglitz (1977) and z, which is labour intensive, homogeneous and produced under perfect competition; notice, moreover, that production of x may occur under three different contractual arrangements, namely A-form, P-form and O-form.

Under autarchy, Marin and Verdier (2003a) show that the equilibrium mode of organisation depends on countries’ factor endowment: in countries where the L/H ratio is small, Integration dominates, while human capital abundant countries tend to organise production through single managed firms (O-form); for intermediate levels of L/H, Outsourcing (A-form) emerges.

In the open economy version of their model, L/H changes due to factor price equalisation, pushing towards Outsourcing: trade integration puts pressure on the demand for skills in rich countries because it creates a war for talent and it leads an economy wide shift from low skill intensive organisation (P-form and O-form) to high skill intensive organisations (A-form).

Although organisational convergence towards Outsourcing is more likely the more the distance, in terms of L/H, between two countries, the previous result applies also in case of countries that have similar factor endowment, but differ in corporate cultures under autarchy.

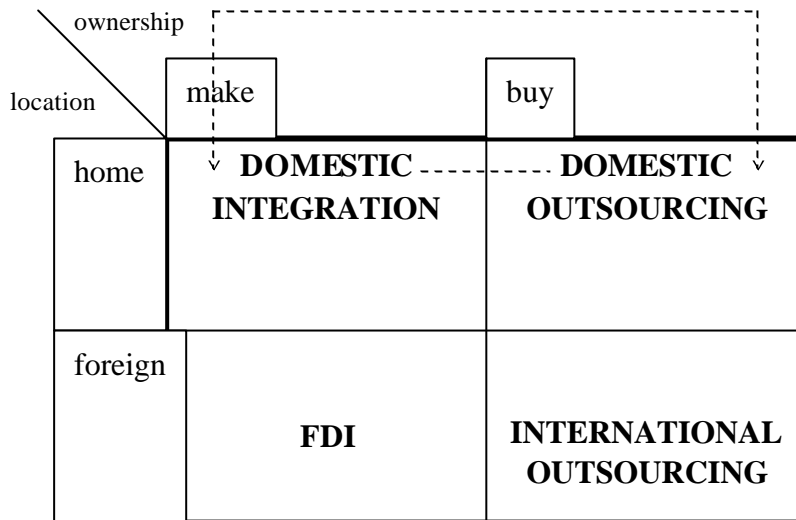
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<sup>25</sup> Other explanations pointed out, for example, the recent improvements in financial markets which has made physical capital easier to obtain, thus reducing its importance within organisations (Rajan and Zingales 2002); the diffusion of Information and Communication Technologies that require high skilled-employees (Lawrence and Slaughter 1993); or the trade integration with low wage countries (Leamer 1993).

<sup>26</sup> The link between trade integration and talent is explored also in Manasse and Turrini (2001), where Rosen’s (1981) technological view of the firm is embedded in a general equilibrium model, based on monopolistic competition. In the authors’ view, globalisation may occur via trade integration (i.e. fall in trade barriers and lower transportation costs) or via technological change (namely innovations in product and communication technologies that enable suppliers to reach a larger mass of consumers and improve the perceived quality of their products). In the model, firms that employ talented workers manage to produce high quality goods and gain larger profits; due to the presence of fixed market access costs, only high performing firms engage in export. An increase in income inequality is shown to be associated with export growth only when globalisation takes place through reduced trade barriers.

Figure 4: Organisational forms in Archetype 3-based models

*Marin-Verdier (2002, 2003a, 2003b)*  
*(domestic ownership decision)*



We believe that this paper makes three steps further Marin and Verdier (2002) because: 1) the role of human capital is captured and its interaction with the market environment is clearly spelled; 2) the international context is explicitly drawn, by means of a North-South model à la Krugman and Helpman; 3) while Marin and Verdier (2002) conclude that similar countries, with different corporate cultures, may eventually converge to the same organisational form, but leave such a form indeterminate, this paper also predicts the destination of convergence.

However, the Internalisation issue remains unexplored in its international dimension, and only the domestic ownership decision is modelled, by finding that a world wide war for talent – which is the key force at play – influences firms’ decision between Domestic Integration and Domestic Outsourcing.

Figure 4 summarizes Archetype 3based contributions, according to their themes.

#### 4. Conclusion

In the present paper, we have provided a unitary framework to analyse recent contributions on foreign direct investment – a topic that has traditionally been studied within International Economics – through new tools derived from different theories of the firm.

These contributions share a common feature in bridging ideas, originally developed in Microeconomics, with an international setting of trade and FDI, so that the make-or-buy decision of multinational corporations is assessed through the opening up of the “black box” and the simultaneous endogenization of the market environment.

Our key, in reading the burgeoning literature on Internalisation has been to recognize three Archetypes, based on famous theories of the firm – Grossman-Hart-Moore treatment of hold-up and contractual incompleteness, Holmstrom-Milgrom view of the firm as an incentive system, Aghion-Tirole conceptualisation of formal and real authority in organisations – and show

how they have been embedded in equilibrium models to explain the boundaries of global enterprises.

In presenting the papers, within each field, we did not follow a chronological order, rather we moved from the simpler specifications where only ownership – Integration versus Outsourcing - or location – Home versus Foreign country - decisions were analysed, to richer formalisations that accounted for the intersection of the two dimensions, giving rise to the four alternatives of Domestic Integration, Domestic Outsourcing, FDI and International Outsourcing.

While Archetype 1 based-approach has fruitfully developed in a number of interesting directions, offering a complete characterisation of the interactions between ownership and location choices (Section 2), Archetype 3 based-approach is the least mature, since the domestic ownership decision is the only issue that has been treated so far, following Aghion and Tirole (1997) theory of formal and real authority (Section 3.2).

Despite the important achievements that the literature surveyed here has reached, we believe that a few tesseræ are still missing in drawing the complete picture.

As far as we know, no attempt has been made in combining the three archetypes in a unitary framework to see how hold up concerns may eventually interact with incentives problems, and how this richer apparatus can be settled in equilibrium models.

In Feenstra and Hanson (2004), Archetype 1 and 2 are treated as complements, rather than substitutes, but the authors only build a simple theory of the firm model, without any attempt at endogenizing the market environment.

Moreover, notice that the whole set of models reviewed in this paper focus on vertical FDI – aimed at saving on costs - while neither the hold up mechanism nor the incentive issue has been applied to a situation of horizontal FDI – aimed at selling in the local market.

This, together with the need of empirical tests to complement such a theoretical literature, represents one of the main challenge for future work on Internalisation.

Finally, we believe that a future agenda should include also a richer menu of contractual arrangements, other than FDI versus partnering: except for Ottaviano and Turrini (2003) no attempt has been made to compare the attractiveness of a broader array of alternatives - including export, integration and various forms of Outsourcing – but still their model takes the international dimension as given, considering only ownership concerns, and ruling out the location dimension.

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