The sale of relational capital through tenure profiles and tournaments

Paul Frijters

Department of Economics, Tinbergen Institute, Free University Amsterdam, Room 2A-24, de Boelelaan 1105, 1081 HV, Amsterdam, Netherlands

Abstract

In this paper, a specific form of human capital is analyzed, relational capital, which consists of matches between market parties. Search and information costs make these matches valuable to both parties. Its peculiarity is that the control over such matches is transferred within firms from those who initially control it to anyone who works with it for a period. This characteristic allows someone who approaches the end of his working life to sell his relational capital to junior partners. This sale can explain upward sloping tenure profiles and can result in tournaments if juniors are budget-constrained and perfect contracting is not possible. The need to keep the amount of relational capital constant implies a generational balanced workforce within each firm. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

One of the basic insights of search and matching theory is that the match between market parties is a valuable asset because the matched parties do not need to spend search effort to find someone else (e.g. Diamond, 1982; Osborne and Rubinstein, 1990). In this paper, it is argued that a match will in many cases be controlled, making it a valuable and limitedly transferable form of capital.

Tel.: +31-20-4446155; fax: +31-20-4446005.
E-mail address: pfrijters@econ.vu.nl http://www.econ.vu.nl/medewerkers/pfrijters (P. Frijters).
Consider for instance the relationship between a financial consultant and a client who wants the same type of service over many years. The financial consultant has information about the specific wishes of that client. He can choose to cater for these wishes himself, or can search someone else within the firm to cater for these wishes. Because the financial consultant has information both on the wishes of the client and on the type of services provided by the other workers in his own firm, the financial consultant can control the matching of the client. Because others do not combine the same knowledge, the match between the financial consultant and the client can be interpreted as a kind of relational capital possessed by the financial consultant. Similarly, the matching process between service demanders and providers within a firm can also lead to the existence of relational capital on the part of the individuals who control this internal labour market.

The main question in this paper is how relational capital affects wages and the internal organization of the firm.

For the most parts, relational capital is like other forms of human capital: its owner will obtain higher wages than someone who does not have relational capital and its value is determined by the costs of replacing it, i.e. the search and information costs of obtaining contacts and clients. The wages of lawyers, consultants, bankers, and accountants have indeed been found to depend on the amount of clients and contacts they have (Mortensen and Vishwanath, 1994; Sherer, 1995; Kimball, 1997). Relational capital, however, has one unusual characteristic explored further which is that relational capital (as a form of information) can be transferred to others, whereas most forms of human capital cannot be transferred. Clients and contacts, both within a firm and outside a firm, can be passed on from senior professionals/lawyers/consultants to juniors. The difference with forms of human capital that can be shared such as firm-specific knowledge or technical know-how is that a transfer of relational capital from one person to another does not increase the total stock of relational capital: knowledge about the workings of a machine can be shared in the sense that someone acquiring such knowledge can, without significant search costs, immediately buy another similar machine and start producing. Because the acquired knowledge about the wishes of one particular client conveys no information about other potential clients, the value of this information is fixed.

The transferability of relational capital allows the owners of relational capital who are at the end of their working lives to sell it to junior partners. This could explain why the oldest partners in law firms, consultants firms, and medical practices often earn the most (for empirical studies and reviews of tenure profiles, see, e.g. Main et al., 1993; Ferrall, 1996; Gibbons, 1996). With a simple model that captures this feature of relational capital, it is shown that tenure profiles can be a form of sale when juniors are budget-constrained and can be penalized for quitting. It is also shown that keeping the amount of relational capital per worker constant at its optimal level requires firms to be made up of overlapping generations.
A different form of sale arises when juniors are budget-constrained and it is not possible to contract penalties for quitting. In that case, juniors can only pay with labour during the period that the relational capital is being transferred. As a result, juniors then face a tournament for relational capital where many juniors start out in firms where relational capital is important, but only a few are retained (for early studies on the existence of tournaments, see Lazear and Rosen, 1981; Nalebuff and Stiglitz, 1983). Tournaments are indeed known in the literature to occur often in law firms and consultants firms (e.g. Main et al., 1993; Ferrall, 1996).

An added advantage of holding a tournament for seniors is that it exploits the possibility that all juniors may overestimate the chance that they will win a tournament, which allows the seniors to make a profit by holding a tournament in stead of a straight sale. The reason that juniors may overestimate the chance that they will win the tournament is because they overestimate small probabilities (Tversky and Fox, 1995) and overestimate their relative abilities due to self-serving bias (Lea and Webley, 1997).

The contribution of the paper lies in how the interaction of known mechanisms and empirical findings explains some aspects of the management of relational capital in firms. As such, it applies the insights of search theory (Ridder and Van den Berg, 1997) to the literature on the internal economics of the firm (Baker et al., 1994; Prendergast, 1996).

In Section 2, the arguments given above are formalized: a descriptive model is presented, the concept of relational capital is further elaborated and possible strategies for the sale of relational capital are discussed. In Section 3, the empirical identification of relational capital is discussed. Section 4 concludes.

2. A descriptive model

Sold production, denoted by $y$, in any firm in the sector under consideration, requires labour and relational capital:

$$ y = y(L, c) $$

$L = \text{labour units supplied for work}, c = \text{total amount of relational capital in the firm}$. The assumption that labour and relational capital are both valuable, are complements and face decreasing returns implies that $\frac{\partial y}{\partial L} > 0, \frac{\partial y}{\partial c} > 0, (\frac{\partial^2 y}{\partial L \partial c}) > 0, (\frac{\partial^2 y}{\partial^2 L}) < 0, (\frac{\partial^2 y}{\partial^2 c}) < 0, \lim_{L \to 0} (\frac{\partial y}{\partial c}) = 0$. The last assumption ensures that the benefit of acquiring more relational capital eventually becomes zero (too much contacts are unproductive), which will ensure that time spent acquiring relational capital is finite. So as to allow for different firm sizes, it is assumed for simplicity that the firm has constant returns to scale. Hence, only the ratio of $(L/c)$ has to be the same for all firms in equilibrium.

There are two intermediary technologies, one for the creation of relational capital and one for its transfer. Following the interpretation of relational capital as
arising out of search costs, the creation of new relational capital costs time: during the time that a person acquires relational capital, he cannot spend his time working. As in most of the search literature (for a survey see Ridder and Van den Berg, 1997), matches (and hence relational capital) arrive at a constant rate. This means we can write \( c = qt \) as the amount of relational capital a worker obtains by spending \( t \) periods acquiring relational capital using search technology \( q \).

The second intermediary technology is the transfer of relational capital. It is assumed that persons \( x \) and \( z \) pool their relational capital if they work together longer than \( m \) periods. If they split up after that time, but remain in the sector, each can take an even share of the pooled relational capital with him. If \( x \) or \( z \) leaves the sector altogether (retires or moves to a different sector), the relational capital remains with the person that remains in the sector. This means that someone near retirement can credibly commit to a transfer of his relational capital to the junior as he cannot contest the relational capital after retirement.

Before we look at the transfer of relational capital, the questions what relational capital actually is, why it can be transferred within a firm, and in which type of firms we could find it, are explored by looking at the micro search-foundation of relational capital.

2.1. What is relational capital and what bounds its value?

Suppose a senior has \( K \) clients; there are \( X \) different types of skills; each individual possesses one skill; each client requires one particular skill. Because the senior possesses one skill himself, say \( x \), all his clients want skill \( x \). The value of the fact that the \( K \) clients are currently matched to the person whose skills they require lies in the search and screening costs that clients and seniors would have to make if they split up. Note that this cost is different from the time cost a worker would have to make to find clients. If the skills are well-defined and generally captured by a particular qualification, the screening costs of finding out the skill type of an individual would merely be the time-cost of finding out the qualifications of an individual in which case the costs would be relatively small. Screening costs will be higher if the skills are not well-defined and there is no correspondence between what a client searches and the qualifications or titles given to individuals in this sector. In the extreme case, screening would entail \( m \) periods of working together to find whether the skill of the individual is the skill that is wanted by the client. If the skill wanted by the clients and the type of the individual are not the same, this screening period would be a net time-cost. In the remainder, we take the costs of searching the individual and finding out whether the skills of an individual is of a particular type as fixed and denote it by \( C_s \).

A client would on average have to screen \( 1/2X \) individuals before he finds someone of the particular type he wants. Having been screened once as a junior (either by a firm or by his \( K \) current clients), the senior has a scale-advantage of screening: by searching and screening on average \( 1/2X \) juniors himself, he can at
once find a match for all his $K$ clients, thereby avoiding $K1/2XC_1$ in search and screening costs for his clients.

This account of relational capital most clearly fits firms of professionals that serve clients, such as legal firms, advertising firms, consultants firms and medical practices. These professionals both work with their clients and are potential intermediaries between their clients and other professionals who could work with the same clients. As far as a match consists of information on clients, these professionals can perform a function similar to that of the intermediaries studied in Bull et al. (1987) and Kahn and Low (1987). By viewing large firms as labour markets in themselves, as Baker et al. (1994) do, one can also try to view some managers as intermediaries between providers of services and clients within the firm itself. For firms where it is reasonable to argue that its managers have such an intermediary role, one can think of the managers as forming a ‘sub-firm’ in which they hold relational capital.

There are three points arising from this sub-model relevant for the following sections. Firstly, that relational capital is indeed limitedly transferable: it is only transferable to someone who has been identified as being of the right type, which requires search and screening costs on the side of the senior and a period of working together on the side of clients to convince them of the compatibility of the match. Secondly, there is a cost in mobility between firms as each firm has to screen applicants in order to find out if they are of the right type. Hence, although these search and screening costs may be small to the firm, less mobility is more efficient. Thirdly, that relational capital only has value while the possessor of the relational capital works with his clients. The value becomes zero when the senior retires and does not transfer the relational capital to a junior.

2.2. Results

2.2.1. The level of relational capital per person

Wealth maximization is the objective of individuals with a discount rate equal to the interest rate $r$ and a working life equal to $M$ periods. For analytical convenience only, $(M/m)$ is assumed to be a natural number. Entry into the sector is free and there is a continuous constant stream of entrants and exits. The transferability of relational capital allows an implicit market for relational capital, whereby a unit of relational capital is worth $p_c = (1/r)(\partial y(1,c)/\partial c)|_{c = \tilde{c}}$ per period with $\tilde{c}$ the optimal amount of relational capital per person in the steady state. The value of labour per period equals $p_L = (\partial y(L,\tilde{c})/\partial L)|^{L=1}_{L=1}$. The rule for the optimal and efficient amount of relational capital per worker becomes:

$$\left. \frac{\partial y(L,\tilde{c})}{\partial L} \right|_{L=1} = \frac{p_L}{p_c} = \alpha$$

(1)
because \( q \) is the rate at which labour can be converted into relational capital. In this case, there will be more capital per worker than if relational capital were not transferable because the price of relational capital is lower in this case.\(^1\) In the steady state, no new relational capital will be accumulated because relational capital is taken to be non-perishable. Hence, all the relational capital present in the steady state has been accumulated previously: in an initial situation with very little relational capital, the price of relational capital is higher than in the steady state and individuals spend time accumulating more relational capital through search. Eventually, the price drops as more relational capital is accumulated until the steady state is reached where no relational capital is accumulated at all. Obviously, it seems likely that in practice relational capital will depreciate and some accumulation will take place in the steady state. The only change this would imply is that the value of relational capital is lower in the steady state and that individuals within firms will continue to spend some of their time searching new relational capital in order to keep the relational capital per worker at a constant optimal level.\(^2\) In the remainder this is ignored to keep the exposition simple.

An efficient way of organizing the transfer of relational capital from those who retire (oldest seniors) to those who enter (juniors) is to have firms where the amount of relational capital per worker is optimal and where there is a transfer of relational capital from a retiring senior to a junior. The advantage is that the amount of relational capital per worker is then kept constant. Because mobility is also to be minimized due to the screening costs \( C_s \) per junior, the optimal outcome requires firms with generational balance. This means that if a firm has one person with skill \( x \) aged \( M - \tau \) years, with \( \tau < m \), there is also a junior with skill \( x \) who has worked at the firm for \( m - \tau \) years, and there is one senior with skill \( x \) aged \( 2m - \tau \), one aged \( 3m - \tau \), . . . , and one aged \( M - \tau - m \). This generational balance implies that there is constantly one junior with no relational capital of his own and one senior who is retiring soon. If there are \( k \) seniors aged \( M - \tau \) in the firm, there are also \( k \) juniors aged \( m - \tau \), etc. The reason for this generational balance is that if there is no generational balance, a firm either has less seniors per junior or more seniors per junior than \( (M - m)/m \). Given the constant returns to scale technology, this means a profit can be made by spreading the juniors evenly over all

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\(^1\) If relational capital were not transferable, individuals would accumulate relational capital at the start of their working lives and then work with it until retirement, just as with education (see Mincer, 1974; or Blaug, 1987). In that case, the amount of relational capital per person would be \( qt \), where \( t \) solves 

\[
y(t, qt) = y(1, qt) = y(t, qt) - qt\ln((1 - e^{-r(M - m)/r}) - y(1, qt)).
\]

\(^2\) With a depreciation rate of \( \delta \), the optimal level of relational capital would then have to solve

\[
\frac{\partial y}{\partial c} \bigg|_{c = \tilde{c}} = \frac{\rho_c}{\rho_r} = q \text{ which implies a lower equilibrium level } \tilde{c}.
\]
firms, such that the ratio of seniors to juniors is \((M - m)/m\), whereby a senior is anyone aged higher than \(m\) years and hence in possession of relational capital.

Therefore, in the generational balanced firms, the amount of relational capital per senior equals \(M/(M - m)\) and the size of firms can be any multiple of \(M/m\). We may note that if there are several seniors in the firm with the same skill \(x\), it is not strictly necessary that the junior works with the relational capital of the senior who retires: the junior could also work with some of the relational capital of other seniors for the first \(m\) periods, while other seniors work with the relational capital of the retiring senior during that period. Hence, when the oldest senior eventually retires, it does not have to be the case that all of his relational capital immediately transfers to the junior, but it could be the case that it transfers to several other seniors, while the junior receives some of the relational capital of the other seniors. Because the oldest senior is the only one whose stock is depleted, he must be compensated by the junior, who is the only one whose stock increases.

2.2.2. The wage implications of the first-best case

What effectively happens with generational balance is that a junior enters a firm of seniors, is screened by a senior as to whether his skill is the same as that of the senior. If the junior is from the same type, he uses an optimal amount of relational capital for \(m\) periods such that the clients also learn that the junior is of the right type and then obtains an amount of relational capital equal to that of the retiring senior.

The question on how to organize this form of leasing and sale of relational capital arises. Four cases are looked at, depending on whether juniors can commit to future wages or not (perfect contracting) and whether juniors are budget-constrained or not.

If juniors are not budget-constrained, the outcome is simple, whether juniors can commit to future wages or not. A junior then pays \(r\tilde{c}_p\) each of the first \(m\) periods to those seniors whose relational capital he works with and obtains \(y(1,e^{\tilde{c}}) - r\tilde{c}_p = p_{1}\) for each of the first \(m\) periods. After \(m\) periods, the junior pays the retiring senior \(\tilde{c}_p(M/(M - m)) - 1/2e^{-c(M - m)\chi_c}\) for his \(c(M/(M - m))\) units of relational capital and becomes a senior himself. The term \(\tilde{c}_p(M/(M - m))\) denotes the discounted production increasing effect of the \(c(M/(M - m))\) units of relational capital, and the term \(1/2e^{-c(M - m)\chi_c}\) denotes the discounted expected screening costs of selling relational capital in the future (because this is a fixed cost, it does not influence the optimal amount of relational capital per worker).

If juniors are budget-constrained, they cannot pay the retiring senior a lump-sum amount for his relational capital. If contracting is perfect and a junior can commit to future wages, a junior can pay by accepting low wages for a long period. As payment, the senior who retires then can enjoy a period of wages higher than his output before retirement, or could get the whole amount as a lump-sum when he retires. Payment at retirement has the advantage of making an announced retirement more credible, but payment through increased earnings at the end of a
working life may have tax-advantages. Because the value of the relational capital the junior will work with is below the total value of lifetime earnings, such an upward sloping wage schedule is always possible. Because the interest rate equals the discount rate, any age-wage-schedule in which the discounted amount of foregone wages equals \( \bar{c}p_r(M/(M-m)) - 1/2e^{-(M-m)/X_c} \) constitutes an efficient sale. Such a wage-schedule would require penalties for quitting as the junior has an incentive to quit the firm after \( m \) periods, taking the relational capital with him. The penalties could take the form of forbidding the junior who quits the firm to work in the same sector, as this effectively bars the junior from taking his relational capital with him. This explanation for upward sloping tenure profiles augments some current theories that explain upward sloping tenure profiles as incentive devices or surplus sharing devices (see, e.g. Gibbons, 1996; Prendergast, 1996; Teulings and Hartog, 1997; for reviews of this literature).

If juniors are budget-constrained and cannot commit to future wages, the only way for the senior to maximise the revenue of his relational capital is to have juniors pay whatever they can and to reduce the chance for each junior to obtain the relational capital: the senior must hold a kind of lottery. This lottery could take place by having a lottery for juniors actually in the firm, or by having prospective juniors pay for a chance to become a junior.

Consider first a lottery for juniors actually in the firm, termed a tournament: \( n \) juniors of the same age work in an otherwise generational balanced firm with one senior who retires in \( m \) periods. After \( m \) periods, only one junior is retained who obtains the relational capital of the retiring senior and the other juniors are fired. The cycle then starts afresh with \( n \) new juniors. Each junior perceives a subjective probability \( p_r \) of winning the tournament, with the objective probability equal to \( 1/n \). The fact that juniors are budget-constrained is interpreted to mean that they have to receive a wage equal to \( W_{\text{min}} \geq 0 \). The revenue a retiring senior obtains from one junior equals \( p_r(1/r)(1 - e^{-rm}) \) when the junior accepts zero wages for \( m \) periods. There are \( (M-m)/m \) seniors of which one will retire each period. Because the amount of relational capital per worker has to equal \( \bar{c} \), the seniors have \((M-m)/(m+n)\bar{c}\) units of relational capital in total. Because the value of the tournament, as perceived by juniors, must at least equal its cost, there has to hold:

\[
P_r \left\{ \left( \frac{M-m}{m} + n \right) \bar{c}p_r e^{-rm} - \frac{n}{2} e^{-rm} X_c \right\} \geq \int_0^m \left( p_r - w_{\text{min}} \right) e^{-rt} dt
\]

with the right-hand side equal to the amount of production an individual pays to the retiring senior over and above the costs of renting the relational capital he uses. The left-hand side equals the perceived probability of winning the tournament times the value of the relational capital then obtained minus the costs of organising the tournament, evaluated at time 0.
The senior wants to maximise the revenue 
\[ \int_0^n (p_t - w_{min})e^{-\gamma t} - \frac{(n/2)XC_s}{n} \]
subject to the above constraint. A solution with binding constraint and correct perceptions, i.e. \( P_s = 1/n \), has an efficiency loss\(^3\) equal to the extra screening costs of a tournament over and above the screening costs in a direct sale, i.e. \( (n - 1)/2 XC_s \). If there is no solution with binding constraint, the efficiency loss is even greater because the value of holding relational capital will fall, impairing the incentives for its creation.

Assuming a binding solution does exist however and deviating from the assumption that juniors have correct perceptions, we find that tournaments may have another benefit to seniors: if \( P_s > 1/n \) and \( (\delta(1/n)/\delta n) < \delta P_s/\delta n < 0 \), which corresponds to the possibility that juniors overestimate their chance of winning the tournament, then one can see immediately from Eq. (2) that \( n \) can become higher before the outside option constraint is reached and therefore the revenue to the senior can be higher and can exceed the actual value of the relational capital of the senior. There are two possible mechanisms for overestimating the probability of winning. The first is that individuals have been found to be unable to evaluate small probabilities and overestimate them, which is shown most clearly in the experiments of Tversky and Fox (1995). This finding has been used as an explanation for gambling. The second mechanism is that individuals overestimate their own abilities relative to others. Lea and Webley (1997), terming this phenomenon “self-serving-bias,” argue that this mechanism may be evolutionary driven as it may help individuals in bargaining positions where self-esteem is important. However, a tournament may exploit this. When the senior for instance claims that he will only retain the most able of the juniors, the self-serving-bias will mean each junior overestimates his chances and hence accepts lower wages.

The second possibility for organizing a sale in case of budget-constrained juniors who cannot commit to future wages is for the firm to sell the junior position in a lottery to many prospective juniors. In the development literature, such a mechanism is observed with rotating savings and credit associations (e.g. Besley et al., 1994), where individuals pool resources for an asset they cannot individually afford and have a lottery for their combined resources. A possible advantage of such a sale in this case is that it does not require juniors to actually work in the firm. If they would acquire any firm-specific human capital in this firm, firing those who do not win the tournament would carry efficiency costs which is not lost in the case of the lottery. There are three disadvantages of a lottery however. Firstly, each prospective junior must have some resources in order to join the lottery and hence, cannot be completely budget-restricted. If the prospective juniors have very little resources, the screening of the many candidates

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\(^3\) To keep the formulas simple, the effect of the number of juniors on the optimal level of relational capital is ignored.
becomes expensive. Secondly, a lottery takes no advantage of the self-serving bias of juniors. Finally, a firm may face credibility constraints in the organisation of such a lottery.

Whether for these reasons or not, lotteries for junior places do not seem very common. Tournaments do seem to occur in firms where relational capital is important as many juniors who work in firms of professionals do not make it to a senior level (Main et al., 1993; Ferrall, 1996).

Compare this explanation of tournaments with the explanation proposed by Lazear and Rosen (1981), and further developed by Laffond et al. (1993) and Taylor (1995). In those papers, tournaments are incentive devices in the case of monitoring costs. The explanation in this paper (budget-constrained juniors) leads to a different prediction of the wages of job changers: if seniors (presumed tournament winners) have ‘‘won’’ relational capital, they could earn high wages anywhere, whereas if they have merely been lucky winners in one firm, there is no reason why another firm would also pay them high wages. Because this prediction does not differ from standard human capital explanations of wage differentials, it is not useful for identifying the effect of relational capital.

3. Empirical predictions

The question on how we could empirically distinguish the effect of relational capital on wages from other influences such as firm-specific human capital, (limitedly transferable) technical knowledge, incentive-tournaments, bonding, and surplus sharing arises.

There are two key features of the sale of relational capital with which we could distinguish it. The first is that an efficient sale requires generational balance in a firm. After all, in a firm in which everyone is of a high age, the transfer of relational capital from one person who is about to retire to another who is about to retire, makes little sense. The second key feature is that the assets of the individuals who remain in the firm increase when the senior actually retires because they receive the relational capital of the retiring senior. This is not the case with firm-specific information or general knowledge, whether these are transferable or not.

Because the senior who retires can receive the value of his relational capital in the form of a lump-sum amount, we can expect a relationship between retirement bonuses of individuals who retire at the retirement age and age profiles. These considerations lead to two predictions that do not seem to fit other explanations of wage profiles.

1) If there is a sale of relational capital from a retiring senior to a budget-constrained junior spanning many years, steep tenure profiles should coincide with a balanced age profile. Wage–tenure profiles per se are predicted by a great many theories, but the prediction that the wage–tenure-profile should be steeper if the
age-profile is balanced seems new. Hence, I would expect a firm with a steep wage–tenure-profile to have roughly equal amounts of workers of different age groups. A simple test would for instance be whether there is a positive interaction effect of tenure and the variance of age within a firm on individuals’ wages. I would especially expect to see this in firms of professionals. This prediction could be tested on already available data sources that match information on individuals (age, tenure and income as the minimum information) with information about firms.

(2) The retirement bonuses given to a retiring senior worker depend on whether there are many young individuals in the firm also at the time of retirement. In the absence of a spread of ages in a firm, there should be no retirement bonuses because there is no one to sell the relational capital to. An empirical test of this prediction would require a data set with both knowledge about the amount of retirement bonuses given to an individual and the age-profile of the firm for which that individual worked. One possible data source is the French Declaration Annuelle des Salaires (DAS) data set, collected by INSEE, which matches information from the tax records of many individuals with firm-specific information. For large enough firms, this would allow for a construction of an age-profile of firms, which could be related to the retirement bonuses of individuals in those firms. A second possible data source is the Danish Labour Market data (EDA) collected by the Danish Bureau of Statistics, in which 5% of the Danish population is tracked over time.

4. Conclusions

The core assumption of this paper is that control over matches between clients and producers, which is called relational capital, is valuable because of the search costs involved in matching different agents. Those who control matches control a valuable asset that will increase their wages. Some evidence for this assumption comes from Mortensen and Vishwanath (1994) who found that the wages of individuals depended on their contacts. The main argument of this paper then is that relational capital can be transferred from those who initially control the match to any individual with the right skill who is matched for a certain period. This allows the possessor of relational capital to sell this productive asset to a junior at the end of his working life by letting a junior work with the relational capital.

The precise form of sale (lump-sum sale, tenure profiles, tournaments or lotteries) depends on the constraints on the contracts juniors can pre-commit to and on the budget constraints of juniors. However, a generationally balanced structure of firms, which smoothens the amount of relational capital per worker over time, is optimal in each case. Search costs therefore give rise to specific predictions about the internal age structure of firms and remuneration packages.
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