Centralization of franchising networks: evidence from the Austrian franchise sector

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Abstract

Based on the property rights approach, residual decision rights in franchising networks must be allocated according to the distribution of intangible knowledge assets between the franchisor and franchisee. Our analysis follows from this hypothesis: the more important the franchisor's system-specific assets for the generation of residual surplus, the more residual decision rights are assigned to the franchisor, and the higher is the degree of centralization of the franchising network. This property rights hypothesis is tested in the Austrian franchise sector. The results of the study suggest that the franchisor's intangible system-specific know-how and brand name assets have a stronger influence on the allocation of residual decision rights in the franchising network than the franchisee's intangible local market assets.
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1. Introduction

This paper explains the degree of centralization of decision making in franchising networks by applying the property rights theory. In the 1990s, the property rights theory, developed by Alchian, Demsetz, Fama, Jensen, Barzel, Grossman, Hart, and Moore (Alchian and Demsetz, 1993; Fama and Jensen, 1983; Barzel, 1997; Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995), was used to explain the decision and incentive structure of the firm (Jensen and Meckling, 1992; Brynjolfsson, 1994; Brickley et al., 1991; Christie et al., 1995; Hitt and Brynjolfsson, 1997; Hart and Moore, 1999). According to the property rights approach, the structure of decision rights (as residual rights of control) depends on the distribution of intangible knowledge assets that generate the firm's residual surplus (Barzel, 1997; Hart, 1995). Intangible knowledge assets refer to the knowledge and skills (know-how) that cannot be easily codified and transferred to other agents, since they have an important tacit component (Polanyi, 1962; Boisot, 1998). In franchising, intangible knowledge assets refer to the brand name assets and the system-specific know-how of the franchisor and the local market know-how of the

franchisee. The thesis of our paper is that the higher the franchisor's portion of intangible knowledge assets relative to the franchisee's, the more residual decision rights should be assigned to the franchisor, and the higher is the degree of centralization.

Although theoretical and empirical studies dealing with the allocation of decision rights exist in the organizational economics and accounting literature (Aghion and Tirole, 1997; Dessein, 2000; Harris and Raviv, 2002; Christie et al., 1995; Baiman et al., 1995; Nagar, 2002), no prior research—with the exception of Arrunada et al. (2001)—examines the determinants of the allocation of decision rights in franchising networks. This situation may result from the difficulty in acquiring knowledge assets and decision rights data. Compared to the agency and transaction cost theoretical view of Arrunada et al. (2001), we develop a property rights approach of the allocation of decision rights. Our main contribution to the franchising literature is in applying the property rights theory to explain the degree of centralization of franchising networks and in examining empirically the influence of intangible knowledge assets on the structure of decision rights. First, we present a property rights view of the allocation of decision rights between the franchisor and the franchisee, and second, we empirically investigate the degree of centralization of franchising networks in the Austrian franchise

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sector. Consequently, this research moves forward the theoretical aspect of decision making in franchising networks by stating that the allocation of decision rights depends on the intangibility (noncontractibility) of knowledge assets of the franchisor and franchisees.

The paper is organized as follows. Section 2 presents the property rights proposition concerning centralization versus decentralization of decision rights. Section 3 uses the property rights approach to examine the relationship between the characteristics of franchisor's and franchisee's knowledge assets and the allocation of residual decision rights in franchising networks. We develop the proposition that the degree of centralization depends on the distribution of the franchisor's and franchisee's intangible assets. In the fourth section, we apply this framework to derive testable hypotheses. The hypotheses are finally tested in the Austrian franchise sector.

2. The structure of decision rights: a property rights approach

According to von Hayek (1935, 1940), centralization of decision making is only efficient if the central planner has the knowledge that is specific in time and place. March and Simon (1958) applied similar ideas to the design of organization. Due to the CEO's limited information-processing capabilities organizations must delegate decision-making power (see also Van Zandt, 1999; Van Alstyne, 1997). Based on the property rights theory, Jensen and Meckling (1992) argued that organizational efficiency requires that those with the responsibility for decisions also have the knowledge valuable to those decisions. Colocation of decision rights with knowledge can be achieved by transferring the knowledge to the person who has the decision right or by transferring the decision rights to the person with the knowledge. Such transfers mean that knowledge transfer costs determine the degree of centralization of decision making. Decision rights tend to remain in the CEO's office when the costs of transferring knowledge to the central office is low, and decision rights tend to be delegated to lower levels of the hierarchy when the firm primarily produces knowledge that is costly to transfer to the CEO (Malone, 1997).

Which factors influence the knowledge transfer costs? According to the property rights approach (Hart and Moore, 1990; Barzel, 1997; Brickley et al., 1995) the structure of residual decision rights depends on the distribution of intangible (noncontractible) assets. The person who has intangible knowledge assets that generates the residual surplus should have the residual decision rights to maximize the residual income (Rajan and Zingales, 2000). These rights refer to the use of local knowledge as "sticky" information (Von Hippel, 1994) that cannot be easily communicated and specified in contracts due to too high transaction costs. In addition, specific or nonresidual rights

are explicitly stipulated in contracts (Demsetz, 1998). For instance, "specific user rights over a computer may be rights to use it to run a particular program in a particular manner in a particular time period for some specific purpose" (Foss and Foss, 1998). Therefore, they refer to the use of general or explicit knowledge (as tangible knowledge assets) of the parties which can be more easily written down and specified in contracts. Consequently, given the distribution of intangible knowledge assets, the maximum resource value is obtained if the decision rights are assigned to those who are best able to use these assets (Aghion and Tirole, 1997; Malone, 1997; Wruck and Jensen, 1994). The relationship between knowledge assets and decision rights can be stated by the following property rights proposition:

Proposition 1: *The allocation of residual decision rights depends on the characteristics of knowledge assets: The more important a person's intangible knowledge assets for the generation of the residual income relative to another person, the more residual decision rights should be assigned to that person.*

3. Knowledge assets and the degree of centralization of franchising networks

The knowledge characteristics relevant for the allocation of decision rights are the degree of intangibility of knowledge assets. Starting from Itami (1984) and Itami and Roehl (1987) in strategic management, Hall (1989, 1993) develops the concept of intangible assets, which is partially compatible with the concept used in the property rights theory. Hall (1989, 1993) differentiates between two groups of intangible assets: intellectual property and knowledge assets. The first includes patents, trademarks, copyright, registered design, and databases, and the latter refers to the capabilities (skills and know-how) and reputation and goodwill. Intellectual property is contractible; it can be transferred by contracts (Hall, 1989, p. 56).

On the other hand, low degree of contractibility characterizes capabilities and reputation capital because they have an important tacit component (Contractor, 2000; Fernandez et al., 2000). According to Hall (1993), noncontractible assets are the source of competitive advantage because they cannot be easily transferred and imitated. Consequently, Hall's intangible assets concept partially deviates from the concept used in the property rights theory. In economics, intangible assets only refer to the assets with a low degree of contractibility (Hart and Moore, 1990; Brynjolfsson, 1994). We use the latter concept for our analysis.

Which knowledge assets are generated and used in franchising networks and how are the decision rights allocated? The franchisor faces the problem of maximizing the returns to his intangible system-specific assets when they are dependent on investments in local intangible assets of the franchisee (Caves and Murphy, 1976). Based on

Hall's view of knowledge assets, the franchisor's intangible assets refer to the system-specific know-how and the brand name assets as reputation capital (Klein and Leffler, 1981; Doyle, 1990). The system-specific know-how includes knowledge and skills in site selection, store layout, product development, and procurement (Kacker, 1988). The brand name assets refer to intangible investments in system marketing and promotion as signalling device to reduce information asymmetry between the firm and the customers (Norton, 1988; Gonzalez-Diaz and Lopez, 2002). The franchisee's intangible assets refer to the outlet-specific know-how (as tacit knowledge) in local advertising and customer service, quality control, human resource management, and product innovation (Wicking, 1995; Johnson and Lundvall, 2001; Caves and Murphy, 1976; Sorenson and Sorensen, 2001).

How does the distribution of intangible knowledge assets influence the degree of centralization of residual decision rights in franchising networks? Generally, we can differentiate between strategic and operative decisions. Strategic decisions are primarily made by the franchisor, and operative decisions are divided between the franchisor and the franchisee. Operative decisions include marketing decisions (price, product, promotion, service), human resource decisions, and procurement decisions. According to Jensen and Meckling (1992), two ways for allocating decision rights exist: either knowledge must be transferred to those with the right to make decisions, or decision rights must be transferred to those who have the knowledge. Thus, decision rights tend to be centralized in the franchising network when the costs of transferring knowledge to the franchisor are relatively low. This is the case when the franchisor's portion of intangible knowledge assets is relatively high compared to the franchisee. In this case, he has a strong bargaining power, due to his system-specific assets, and can easily acquire the local market knowledge of the franchisee, due to its low degree of intangibility. On the other hand, residual decision rights have to be delegated to the franchisee when his local market know-how is very specific, and consequently, the knowledge transfer costs are very high (Malone, 1997; Brickley et al., 2000). In this case, the bargaining power of the franchisee is relatively strong due to his noncontractible know-how. Both the franchisor and the franchisee have to undertake specific investments to generate a high ex post surplus. Consequently, if it is important to take advantage of franchisee's intangible knowledge assets to generate the residual income stream, he must be given decision-making power to utilize his knowledge.

In sum, residual decision rights have to be allocated according to the distribution of intangible knowledge assets between the franchisor and franchisee. More intangible knowledge assets of the franchisor (franchisee) must lead to more centralized (decentralized) decision making. Therefore, an efficient property rights structure implies complementarity between knowledge assets and decision rights

(Milgrom and Roberts, 1995; Hitt and Brynjolfsson, 1997). The following example illustrates this implication:

Case A: The franchisor has a large fraction of intangible knowledge assets (system-specific know-how), and the local market know-how of the franchisee is less specific. Due to the franchisor's dominant know-how position, he should get a large fraction of residual decision rights to maximize the network's residual income stream. Hence, the franchising network is more centralized.

Case B: The franchisee has a large fraction of intangible knowledge assets (local market know-how) that generate a high residual surplus, and the franchisor's system-specific assets are less intangible. In this case, the residual decision rights must be assigned according to the franchisor's and franchisee's know-how position. Therefore, compared to Case A, more residual decision rights are transferred to the franchisee, and hence, the franchising network is more decentralized.

If this complementarity condition is not fulfilled, the following inefficiencies may arise. (a) In Case A, a misfit exists when the decision power is decentralized, although the franchisor has the most important part of intangible knowledge assets in the network that create a large fraction of the residual income stream. (b) In Case B, a misfit between knowledge assets and decision rights means that the decision power is centralized, although the franchisee has a high portion of intangible knowledge assets which generates a high residual surplus. Due to this incompatibility between the distribution of intangible knowledge assets and the allocation of decision rights, the residual surplus cannot be maximized.

To summarize, the property rights proposition concerning the structure of residual decision rights in franchising network can be stated as follows.

Proposition 2: *The more important the franchisor's (franchisee's) intangible knowledge assets for the generation of the residual income, the more residual decision rights should be assigned to the franchisor (franchisee), and the higher is the degree of centralization (decentralization) of the franchising network. (a) If the franchisor's noncontractible system-specific know-how and brand name assets have a high impact on the total residual surplus relative to the franchisee's intangible knowledge assets, the degree of centralization of the franchising network should be relatively high. (b) If the franchisee's outlet-specific assets are very important relative to the franchisor's intangible knowledge assets, the degree of decentralization of franchising network should be relatively high.*

As a result, the following testable hypothesis can be derived from this property rights approach:

H$_a$: The higher the intangible knowledge assets of the franchisor relative to the franchisee, the higher is the

franchisor's portion of residual decision rights, and the more centralized is the franchising network.

H$_b$: The higher the intangible knowledge assets of the franchisee relative to the franchisor, the higher is the franchisee's portion of residual decision rights, and the more decentralized is the franchising network.

4. Empirical analysis

4.1. Data collection

The empirical setting for testing this hypothesis is the franchising sector in Austria. A national mail survey was used to collect the data from all franchise systems in Austria that were registered at the Austrian Franchise Association in 1997. The database identified a total of 216 franchise systems in Austria representing more than 90% of all franchise systems in Austria. The data set was collected in 1997–1998. After several preliminary steps in questionnaire development and refinement, including in-depth interviews with franchisors in Vienna and representatives of the Austrian Franchise Association, the final version of the questionnaire was pretested with six franchisors. The questionnaire took approximately 20 minutes to complete on the average. The revised questionnaire, which incorporates the alterations suggested by the pretest, was mailed to 216 franchisors in Austria. We received 83 completed and usable responses with a response rate of 38%. To trace nonresponse bias, it was investigated whether the results obtained from analysis are driven by differences between the group of respondents and the group of nonrespondents. Nonresponse bias was measured by comparing early and late responders (Armstrong and Overton, 1977). The nonresponding group includes the firms completing the questionnaire 4 weeks after the first group. No significant differences emerged between the two groups of respondents.

4.2. Measurement and assessment of validity

The Appendix A presents measures used for this study. Three groups of variables are important for testing the property rights hypothesis: knowledge assets and decision rights, as well as coordination economies of scale and sectoral characteristics as control variable.

4.2.1. Knowledge assets

4.2.1.1. Franchisor's intangible knowledge assets.
The franchisor's intangible assets refer to the system-specific know-how and the brand name capital. Based on indicators used in earlier studies (e.g., Lafontaine, 1992; Lafontaine and Shaw, 1999; Sen, 1993; Fladmoe-Lindquist and Jaque, 1995; Scott, 1995), two proxies for the franchisor's intangible knowledge assets are used: training days (initial and annual training) for the system-specific know-how and advertising fees as investments in the brand name capital. (a) The annual number of training days is an indicator of the importance of the franchisor's system-specific know-how to generate the residual income of the network. As argued by Simonin (1999), the higher the degree of intangibility, the less contractible are the knowledge assets, and the more personal (face-to-face) knowledge transfer methods are used, such as telephone, meetings, coaching, and training (Daft and Lengel, 1986). The assumption behind this measure is that as the franchisor's intangible system-specific know-how increases, so does the number of days of face-to-face interaction (Johnson and Lundvall, 2001). A similar measurement concept was used by Argote (2000) and Darr et al. (1995). In addition, Austrian franchisors that we interviewed in the pretest period argued that the franchisors' knowledge assets can be only transferred by contract without face-to-face knowledge transfer mechanisms, if the know-how can be codified and packed into the franchise handbook. Therefore, training is an indicator for the importance of the franchisor's intangible knowledge assets to generate the residual income stream. (b) The second indicator of the franchisor's intangible knowledge assets is the advertising fee representing the intangible investments in brand name capital (Lafontaine and Shaw, 1995, 1999; Agrawal and Lal, 1995; Klein and Leffler, 1981). The more important the franchisor's brand name assets for the generation of the residual surplus, the more marketing investments (national advertising and promotion measures) are required to maintain the brand name value, and the higher are the advertising fees paid by the franchisees.

4.2.1.2. Franchisee's knowledge assets.
The franchisee's intangible knowledge assets refer to the local market know-how as the franchisee's local marketing, human resource, quality control, as well as innovation capabilities (Hall, 1993; Wicking, 1995; Sorenson and Sorensen, 2001) that cannot be easily transferred and acquired by the franchisor. Since it was not possible to receive data from the franchisees, the franchisee's intangible knowledge assets are assessed by the franchisor. In the questionnaire, the franchisors were asked to rate on a five-point scale to evaluate franchisee's intangible assets. A three-item scale measures the local know-how advantage of the franchisee compared to the manager of a company-owned outlet (see Appendix A). The three-item measure was extracted by employing factor analysis. All variables had a loading in excess of 0.59. The total amount of variance explained by the factor solution is 58%. The reliability of this scale was assessed by Cronbach's alpha (.63) which is compatible with the generally agreed upon lower limit of .6 for exploratory research (Hair et al., 1998). One way to assess the convergent and discriminant validity of this measure is to examine respectively the pairwise correlations between the measure and other similar or dissimilar measures (Peter and Churchill, 1986) (see Table 1). Notice that in cell A, the correlation

Table 1
Correlations between franchisee's intangible knowledge measures and other measures

	LMA1: franchisee's know-how advantage (three-item measure— see Appendix A)	LMA2: franchisee's know-how advantage (single-item measure)
CELL A		
LMA1	1	
LMA2	0.352 (0.008)*	1
CELL B		
Advertising	− 0.053 (0.699)	− 0.103 (0.487)
Annual training	0.008 (0.95)	− 0.11 (0.43)
Initial training	0.023 (0.858)	− 0.124 (0.368)

 * Values in parentheses are the *P* values.

between the single- and the three-item measures of franchisee's intangible assets is positive and highly significant. This finding suggests that the two measures demonstrate convergent validity. In addition, discriminant validity requires that the correlations between the measures designed to capture the same construct be greater than correlations involving those measures and other constructs. Notice that the correlation in cell A involving the two measures of franchisee's intangible assets is greater than all the correlations in cell B involving the franchisor's intangible assets measures, demonstrating that the summated scale is significantly different from measures of other variables.

4.2.2. Decision rights

Arrunada et al. (2001) differentiated between completion, monitoring, and termination rights in automobile distribution networks. They adopted relatively crude measures of the extent to which the decisions are allocated within the network because they used contractual data on automobile dealership. Since contractual rights may primarily represent the formal authority in the network, they may deviate from the decision rights representing the real authority (Aghion and Tirole, 1997). Our decision rights variable includes the following decisions in the franchising network: procurement decision, price and product decisions, advertising decision, human resource decisions (recruitment and training), investment and finance decisions, and decisions concerning the application of accounting systems. The indicator of decision rights addresses the extent to which residual decisions are made by the franchisor and the franchisee. Hence, it is a measure of centralization/decentralization of decision making in the network that is compatible with the Nagar's (2002) measure of decision rights in retail banking. The franchisors were asked to rate the franchisee's influence on these decisions on a seven-point scale. By averaging the scale values, we constructed a decision index varying between 1 and 7. The higher the index, the higher the franchisee's influence on residual decision making, and the higher is the degree of decentralization of the franchising network. Consequently, the decision index varies positively

with the degree of decentralization and negatively with the degree of centralization of decision making.

4.2.3. Control variables

We controlled for two variables that might affect the degree of centralization of franchising networks. These variables refer to the total number of outlets representing economies of scale of coordination and monitoring and the sectoral characteristics. Administrative costs as setup costs of the franchisor's headquarters may influence the tendency toward centralization of decision making. The larger the total outlets, the lower are the average administrative costs of the central office, the larger are the coordination economies of scale, and hence, the higher is the tendency toward centralization (Brickley et al., 1991; Shane, 1996). Therefore, we use the number of franchisee- and company-owned outlets as indicator for the coordination economies of scale. In addition, because the know-how intensity of franchising firms varies between product franchising and service firms (Zeithaml et al., 1985; Rushton and Carson, 1989; Lafontaine and Shaw, 1999; Windsperger, 2002), we include a sectoral variable to control for sectoral effects. Zero refers to product franchising and one to the services sector. Since product franchising firms are characterized by a higher fraction of intangible system-specific assets of the franchisor relative to the intangible local market assets of the franchisees, the franchisor should have a higher proportion of residual decision rights, and hence, the degree of centralization should be higher than under service firms.

4.3. Results

4.3.1. Descriptive statistics

Table 2 presents descriptive data for the Austrian franchise sector. The structure of decision rights is presented in Table 3. Generally, a tendency toward decentralization of decision making exists. In addition, the results reveal that human resource decisions, investment and finance decisions, as well as local marketing decisions are more decen-

Table 2
Franchise systems in Austria

	N	Minimum	Maximum	Mean	Standard deviation
Advertising fee (percent of sales)	67	0	9.00	1.2806	1.70
Franchisee's annual training days	76	0	70	8.63	9.68
Initial training days	78	0	200	23.53	35.88
Total number of outlets	82	1.00	400	30.3293	59.50
Franchisee's local market knowledge advantage	71	1.00	5.00	3.8732	1.28
Franchisee's quality control advantage	70	1.00	5.00	2.7857	1.39
Franchisee's innovation advantage	69	1.00	5.00	3.5072	1.36

Table 3
Decision rights in the Austrian franchise sector

	N	Minimum	Maximum	Mean	Standard deviation
Procurement decision	81	1	7	3.94	2.30
Product decision	83	1	7	4.73	2.00
Accounting system decision	81	1	7	4.74	2.16
Resale price decision	83	1	7	4.88	2.14
Advertising decision	83	1	7	5.29	1.76
Employees' training decision	82	1	7	5.35	1.57
Investment decision	83	2	7	5.87	1.49
Financial decision	83	1	7	6.05	1.63
Recruiting decision	83	1	7	6.53	1.30

tralized, and procurement, price, product, and accounting system decisions are more centralized. This conclusion indicates that the franchisee's residual decision rights are closely related to his outlet-specific know-how, and the franchisor's residual decision rights are closely connected with his system-specific assets.

4.3.2. Regression analysis

To test the hypothesis, we carry out a regression analysis with the index of decision rights as independent variable. In the first step, we conducted a binary logistic regression analysis (Demaris, 1992). We divided the franchise systems into two groups: More centralized systems are systems with a decision index between 3 and smaller than 5, and more decentralized systems are systems with an index between 5 and 7. Since only 2 out of 83 franchise systems realized a decision index smaller than 3, these systems are deleted from the data set. Hence, the value of the dependent variable (DR) is 0 for more centralized systems and 1 for more decentralized systems. In the second step, we conducted an ordinal regression analysis by dividing the decision variable into three groups (Chu and Anderson, 1992): Systems with a high degree of centralization (1–3.5), systems with a medium degree of centralization/decentralization (3.5–5.25), and systems with a high degree of decentralization (5.25–7). The explanatory variables refer to initial and annual training days (IDAY, ADAY), advertising fees (FEE), franchisor's perception of franchisee's local market know-how advantage (LMA1), and the number of outlets (OUT) as well as the sectoral dummy variable (SEC). Therefore, we estimate the following regression equation:

$$DR = \alpha + \beta_1 IDAY + \beta_2 ADAY + \beta_3 FEE + \beta_4 LMA1$$
$$+ \beta_5 OUT + \beta_6 SEC$$

Based on our property rights hypothesis, DR varies negatively with the training days and advertising fees. In addition, DR varies positively with the franchisee's local market know-how advantage (LMA1). Hence, β_1, β_2, and β_3 have negative signs and β_4 a positive sign. Further, we

include two control variables: DR may vary negatively with the number of outlets (OUT); hence, β_5 has a negative sign, indicating that coordination economies of scale increase the tendency toward centralization. Since product franchising firms have a higher fraction of intangible knowledge assets of the franchisor, the degree of decentralization should be lower than under service firms; hence, β_6 should have a positive sign.

Results of the binary logistic and ordinal regressions are provided in Tables 4a–4d. The regression equation is estimated in two steps: First, we tested the model without control variables (model 1) and second with control variables (model 2). The fit of the models was tested based on the log of the likelihood ratio. For model 1, the chi-square value of 29.046 [13.415] is significant at $P < .01$ thus rejecting the null hypothesis that the estimated coefficients are 0, thereby, the value of ordinal regression analysis are indicated in brackets. The overall fit of the binary logistic regression model represented by a significant chi-square and its predictive ability (82% of the observations are correctly classified) point to the appropriateness of the set of variables in predicting the degree of centralization of franchising networks. In model 1, the coefficients of annual training days and advertising (ADAY and FEE) are significant and consistent with our property rights hypothesis. Contrary to the property rights hypothesis, the coefficient of initial training days (IDAY) is positive and significant in the binary logistic regression model. One possible explanation could be the influence of initial training upon the requirement for centralized control. The more system-specific know-how is transferred to the franchisees at the beginning of the contractual relationship, the less control by the franchisor's headquarter is required during the contract period. In addition, the coefficient of the local market know-how (LMA1) is positive but not significant under the binary regression analysis. In the second model, two control variables are added (see Tables 4c and 4d). The

Table 4a
Logistic regression results (Model 1)

Model 1: binary logistic regression	
Dependent variable: decision rights (DR)	
Independent variables	Coefficients
Intercept	3.385*** (1.11)
Annual training days (ADAY)	− 0.412*** (0.13)
Initial training days (IDAY)	+ 0.103*** (0.04)
Advertising fee (FEE)	− 1.158*** (0.44)
Local market know-how advantage (LMA1)	+ 0.621* (0.45)
Model statistics	
$N = 81$	
Model chi-square = 29.046 ($P < .01$)	
− 2 Log likelihood = 37.361	
Correct classification % = 82	
Nagelkerke R^2 = .599	

Values in parentheses are standard errors.
 * $P < .17$.
 *** $P < .01$.

Table 4b
Ordinal regression results (Model 1)

Model 1: ordinal regression	
Dependent variable: decision rights (DR)	
Independent variables	Coefficients
Threshold constants	-4.67*** (1.03)
	-1.153** (0.5)
Annual training days (ADAY)	-0.119*** (0.04)
Initial training days (IDAY)	$+1.400e-02$ (0.01)
Advertising fee (FEE)	-0.321* (0.19)
Local market know-how advantage (LMA1)	$+5.375e-02$ (0.31)
Model statistics	
$N=83$	
Model chi-square $=13.415$ ($P<.01$)	
-2 Log likelihood $=75.612$	
Nagelkerke $R^2=.28$	

Values in parentheses are standard errors.
* $P<.1$.
** $P<.05$.
*** $P<.01$.

chi-square value increased from 29.046 to 33.428 [13.415 to 25.628], the -2 log likelihood decreased from 37.36 to 32.01 [75.612 to 62.033], and the Nagelkerke R^2 increased from .599 to .671 [.28 to .485] showing a better fit of the model by including the sectoral and coordination economies of scale variables. Compared to model 1, the significance of the coefficient of franchisee's local market know-how is slightly higher ($P=.116$) under the binary logistic regression analysis. Further, the coefficient of the sectoral variable is not significant. Finally, colinearity diagnosis was performed using correlations between the independent variables. The correlations between initial training and annual training days as well as between initial training and advertising are relatively high ($r=.50$ and $r=.43$; $P<.01$). This is not surprising as these variables have been used as measure of the franchi-

Table 4c
Logistic regression results (Model 2)

Model 2: binary logistic regression	
Dependent variable: decision rights (DR)	
Independent variables	Coefficients
Intercept	5.095*** (1.66)
Annual training days (ADAY)	-0.532*** (0.19)
Initial training days (IDAY)	$+0.136$*** (0.05)
Advertising fee (FEE)	-1.574*** (0.57)
Local market know-how advantage (LMA1)	$+0.771$* (0.52)
Number of outlets (OUT)	-0.015** (0.01)
Sector (SEC)	-0.592 (1.06)
Model statistics	
$N=81$	
Model chi-square $=33.428$ ($P<.01$)	
-2 Log likelihood $=32.01$	
Correct classification % $=81.6$	
Nagelkerke $R^2=.671$	

Values in parentheses are standard errors.
* $P<.12$.
** $P<.05$.
*** $P<.01$.

Table 4d
Ordinal regression results (Model 2)

Model 2: ordinal regression	
Dependent variable: decision rights (DR)	
Independent variables	Coefficients
Threshold constants	-7.083*** (1.70)
	-2.357*** (0.75)
Annual training days (ADAY)	-0.145*** (0.06)
Initial training days (IDAY)	$+2.320e-02$** (0.01)
Advertising fee (FEE)	-0.333^+ (0.20)
Local market know-how advantage (LMA1)	$-2.650e-02$ (0.33)
Number of outlets (OUT)	$-2.095e-02$*** (0.01)
Sector (SEC)	-1.244* (0.75)
Model statistics	
$N=83$	
Model chi-square $=25.628$ ($P<.01$)	
-2 Log likelihood $=62.033$	
Nagelkerke $R^2=.485$	

Values in parentheses are standard errors.
* $P<.1$.
** $P<.05$.
*** $P<.01$.
+ $P<.11$.

sor's system-specific assets. The fact that the effect of annual training days and advertising on the degree of centralization is high and significant further supports our property rights hypothesis about the importance of the franchisor's intangible assets in determining the 'optimal' degree of centralization of the network.

4.4. Discussion

This study presents the first empirical evidence that the degree of centralization of franchising networks depends on the distribution of intangible knowledge assets of the franchisor and the franchisee. The results suggest that the franchisor's intangible system-specific know-how and brand name assets have a stronger influence on the allocation of residual decision rights in the franchising network than the franchisee's intangible local market assets. Differences in the allocation of residual decision rights may be attributed to differences in the distribution of intangible knowledge assets between the franchisor and the franchisee. However, our empirical study has some limitations: the low significance level of the franchisee's local market assets might result from perceptual errors, because this measure was based on the franchisor's opinion. In future research, the operationalization of franchisee's knowledge assets should be improved by collecting data from franchisees. In addition, the measures for the franchisor's intangible assets must be improved. One possibility to improve the validity would be to measure the franchisor's intangible assets by a multi-item scale and to compare the regression results with the regression results of our proxy variables. The use of ordinal-dependent variable with more than three decision groups requires a larger data set in order to realize a minimum number of cases in each subgroup of the decision variable (Hosmer and Lemeshow,

1989). Furthermore, future research has to investigate the relationship between the allocation of decision rights and the performance of the franchise systems. Our property rights proposition suggests a positive relationship between the complementarity of intangible assets and residual decision rights on the one hand and the performance of the franchise network on the other.

This study also has managerial implications. The result of this study indicates that the distribution of decision power in franchising must be based on the importance of the franchisor's and the franchisee's knowledge assets for the creation of residual surplus. Therefore, this study provides franchisors with an explanation of a way to structure the residual decision rights in the network. The network's decision structure must be aligned both with the franchisee's outlet-specific and the franchisor's system-specific assets. High franchisee's outlet-specific capabilities under a high degree of centralization of decision making may not generate a high residual surplus, because franchisees do not efficiently use their intangible knowledge assets. Conversely, high franchisor's system-specific capabilities under a low degree of centralization are unlikely to maximize the residual income stream, because the franchisor is unable to influence the asset usage.

5. Concluding remarks

The paper presents a property rights explanation of the degree of centralization of decision rights in franchising networks. Residual decision rights have to be allocated according to the distribution of intangible knowledge assets between the franchisor and franchisee. The more important the franchisor's intangible knowledge assets for the generation of residual surplus relative to the franchisee's, the more residual decision rights must be assigned to the franchisor. Consequently, under a property rights view, an 'optimal' degree of centralization of franchising networks requires colocation of knowledge assets and decision rights. Using data collected in the Austrian franchise sector, we offered the first empirical evidence that the degree of centralization of franchising networks varies with the distribution of intangible knowledge assets between the franchisor and franchisee. Although our empirical study is not without limitations, we hope it provides theoretical and practical insights and stimulates further research in organizational economics and management to explain the microstructure of franchising networks.

Acknowledgements

Appendix A. Measures of variables

Annual training days (ADAY): number of franchisee's training days a year

Initial training days (IDAY): number of franchisee's training days at the beginning of the contract period

Advertising fees (FEE): franchisee's payment of advertising fees (percentage of sales)

Franchisee's intangible knowledge assets:
LMA1 (three items; Cronbach's alpha=.63): franchisee's know-how advantage compared to the manager of a franchisor-owned outlet evaluated by the franchisor (1 = no advantage to 5 = very large advantage)
  (1) Innovation
  (2) Local market knowledge
  (3) Quality control
LMA1 (single-item measure): franchisee's product and labour market knowledge advantage (1 = no advantage to 5 = very large advantage) evaluated by the franchisor

Outlets (OUT): number of franchisee- and franchisor-owned outlets

Sectors (SEC): 0 = product-franchising firms; 1 = service firms

Decision index (DR) (mean of 1–8):
To what extent are the following decision made by the franchisee?
(1 = no extent to 7 = to a very large extent)
  (1) Procurement decision
  (2) Product decision
  (3) Accounting system decision
  (4) Resale price decision
  (5) Advertising decision
  (6) Employees' training decision
  (7) Investment and financial decision
  (8) Recruiting decision

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