Employer Cooperation in Referral Networks*

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Abstract

How do employers, competing in the same markets, come to cooperate? In dyads, cooperation evolves if pairs of actors interact repeatedly, because it is mutually beneficial. Third actors support such dyadic cooperation by circulating information on actors' past behavior allowing actors to avoid non-cooperators. This paper focuses on the role of these third actors in cooperative networks. It shows that third actors establish local hierarchies (transitive triads), rather than horizontal connections (cycles). Local hierarchies may reflect actors' desire to achieve prestige by connecting to higher-standing actors. Empirically, the paper analyzes how employers cooperate in networks by exchanging information on prospective employees (referral networks). It analyzes eight local referral networks in two different economic sectors based on exponential random graph models. Results show that triadic closure in these networks takes a hierarchical (transitive) form, rather than one of horizontal exchange (cycles). This finding is interesting considering the literature highlighting reciprocity as an important factor facilitating cooperation.

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1 Introduction: The importance of third actors

This paper analyzes the role of third actors in dyadic cooperation. The literature has established that closed triads, in which all three actors are connected to all of their counterparts, are beneficial for cooperation. In empirical analyses of cooperative networks there is therefore often a tendency for triadic closure. Looking at the direction in which these triads close, allows approaching the underlying dynamics and motivations of such triadic closure.

Typically, third actors are seen to 'embed' the cooperating dyad. Third actors support a dyad's cooperation relating information on the cooperators (Uzzi, 1997). Cooperation evolves more easily in triads, because information on the likely behavior of actors circulates. Connecting two of one's contacts with one another facilitates cooperation between these two otherwise unconnected actors, because the third actor takes on the role of a grantor. Uzzi describes this as a "rolling over of expectations" ((Uzzi, 1997)). In addition, sanctioning is cheaper in triads, because the costs for sanctioning an uncooperative counterpart can be divided between two cooperators ((Coleman, 1988a)). Thus, third actors are important in that they transfer information on other actor's cooperativeness, so that non-cooperators can be avoided or help sanctioning non-cooperators, so that they cooperate.

This literature on the function of triadic closure is in line with findings on dyadic cooperation. This mostly experimental literature has highlighted the supporting role of third actors in circulating information on past behaviors to current cooperators. Such information limits the opportunities to exploit others, because non-cooperators can be excluded through sharing information on their past behavior (Axelrod, 1984; Granovetter, 1985; Raub and Weesie, 1990; Macy and Skvoretz, 1998; Starkey, Barnatt, and Tempest, 2000; Tomochi, 2004; Dijkstra and Assen, 2013a).

This paper argues that third actors have an additional function, namely establishing local hierarchies, incentivizing actors to cooperate by connecting to a higher-standing actor. Complementing the literature on cooperation with the literature on inter-organizational networks, this paper argues that prestige is an important additional motive for actors to cooperate (Aerne, 2020; Clark and Wilson, 1961; Dijkstra and Assen, 2013b; Knoke, 1988; Puffer and Meindl, 1992). Gaining prestige compensates actors for contributing to a public good. In addition,

a clear status hierarchy clarifies which actors assume the costs of cooperation: lower standing actors bear the cost of cooperation, and are compensated by establishing a connection to a higher-standing actor (Aerne, 2020).

The paper contributes to the literature in several ways. On a conceptual level, the paper contributes to the literature on cooperation, proposing that prestige is an important motive for cooperation. It suggests an alternative interpretation of the widely found importance on triads: triads are not mainly about sharing information on others, but about establishing hierarchies. Reciprocity and embeddedness may thus play less of a role in cooperation than previously assumed.

Empirically, the paper analyses employer referral networks. These networks present a case of cooperation that allows understanding how cooperation can be achieved in competitive situations. Other instances where employer cooperation matters and to which our analysis may extend include collective training (Culpepper, 2000; Culpepper, 2003), active labor market policy (Martin and Swank, 2004), building an occupational labor market to protect wages (Trampusch, 2020), and classical interest-based lobbying (Olson, 1965). On the most general level, this analysis shows how employers cooperate and thereby mitigate competitive pressure in markets. It thereby contributes to better understanding of markets more generally (Beckert, 2009, White, 1981).

Referral networks are also an interesting case in itself worth studying. The literature on hiring channels has focused predominantly on the role of current employees to refer their acquaintances to their employer. Much less is known about how employers come to trust references from other employers, even though it is a fairly common practice to ask for and present references from previous employers. Referral networks have important distributional consequences (Montgomery, 1991, Kugler, 2002): referred workers tend to earn higher wages. Understanding better how employers manage to build referral networks thus also sheds light on inter-industry wage differences.

The remainder of the paper is structured as follows. First, it traces the role of triads in cooperation and argues that prestige is an important motive to close triads, drawing on the literature on inter-organizational networks. It then presents the case (referral networks) and argues that

these networks present an important instance of cooperation. A next section contextualizes this study and describes the fiduciary and childcare sectors in Switzerland. Subsequently, it presents the data and the estimation method. This is followed by the results section. A fifth section discusses the results and concludes.

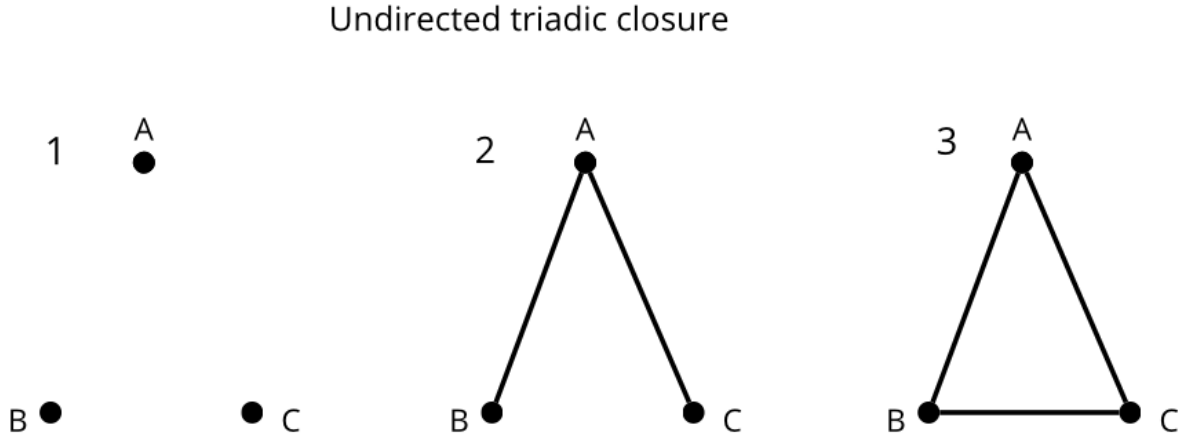
2 Literature: How do triads close?

From the literature on dyadic cooperation we know that third parties are important to ensure dyadic cooperation for two reasons: (1) third actors provide warranted information on the co-operating parties, (2) and third actors help sanction non-cooperators of a dyad. Drawing on the literature on inter-organizational cooperation, this paper argues that third parties are important in cooperation, because (3) they create a hierarchy between two existing cooperators, incentivizing actors to cooperate with the next higher party in order to gain status.

Third actors support dyadic cooperation (Coleman, 1988a, Coleman, 1988b, Uzzi, 1997). As can be seen in figure 1 closed triads in which three actors are connected as in panel (c) are distinguished from open triads as shown in panel (b). In closed triads, actor B may "roll over expectations" to the other C via this third intermediary party A with whom B had been cooperating. A reduces the insecurity B and C are exposed to when entering a cooperative relationship, because B and C both know A as a reliable cooperator that has certain expectations in cooperation that they themselves fulfil and that others of As cooperator are also likely to fulfil (Raub and Weesie, 1990; Uzzi, 1997). In addition, sanctioning is cheaper in closed triads, because the costs for sanctioning an uncooperative counterpart can be divided between two cooperators (Coleman, 1988a). In an open triad, if B defects in its cooperation with A, A bears the costs of sanctioning B alone. However, if B cheats A in a closed triad, A and C can divide the sanctioning costs. Thus, third actors are important as they transfer information on other actors' cooperativeness, and also make non-cooperation more costly.

However, there are also incentives for actors not to close an open triad. For actor A, who occupies the role of a broker in panel (b) there are incentives to keep its two cooperators B and C separate from one another. Establishing the connection (B-C) in an open triangle bears the risk for A that they will leave her out in their next cooperation. Actor A also enjoys the unique

Figure 1:
Triadic Closure



access to information from both B and C if these other two remain unconnected (Burt, 1976, 2000; Buskens and Rijt, 2008).

Third actors may thus have very different functions in mediating dyadic relations (Burt and Knez, 1995; Latora, Nicosia, and Panzarasa, 2013; Podolny, 2001; Simmel, 2009). Actor's incentive to close a triad might depend on the type of relation actors are involved in. If the network is about the flows of resources, actors have little incentive to close the triad. In contrast, if a tie consists of an evaluation of the actor, which allows making inferences about the underlying quality of actors there might well be an incentive to close triads (Podolny, 2001).

Looking at directed networks, and thus at the form of triadic closure may shed further light on the motivations of actors to close triads (Lomi and Pallotti, 2012). In a directed triad with three actors and three ties, there are two possibilities to close a triad: a transitive and cyclic form of triadic closure. Cyclic triadic closure is usually described as a form of generalized reciprocity or generalized exchange. As displayed in figure 2, in a cyclic triad B extends a relation to A which extends a relation to C. C then closes the triad by extending a link to B. Each actor receives and extends a tie, without directly reciprocating to the actor of whom they receive a tie.

Such cycles are very robust against exploitation. Cyclic exchange is more robust against exploitation compared to dyadic cooperation (Bearman, 1997). Dyadic reciprocity leaves room for exploitation within pairs of exchange, because actions outside of the dyadic exchange are ignored by outside actors. In cyclic exchanges, or systems of generalized reciprocity in contrast,

each actor forming part of the cycle cares about every exchange. Failing to adhere to the norm of reciprocity by one actor threatens to drain all actors of a scarce resource, and therefore every actor is invested in maintaining the cycle and thus in preventing dyadic exploitation. Cyclic exchange where each actor is responsible to reciprocate to a specific other is also seen as more robust against exploitation compared to a situation where actors are asked to contribute to a pool of resources (Yamagishi and Cook, 1993).

Once established, such cyclic exchange structures are self-reproducing from the rational actions of individual participants. Rational choice can however not help explain the presence of such cycles. Such cyclic triads can for instance be found within a firm (Baker and Bulkley, 2014). Member A of an organization may help member C, because member C helps member B. An alternative mechanism of cyclic triadic closure may be that, organization A helps party C because a B is watching and might be more inclined to support A in return.

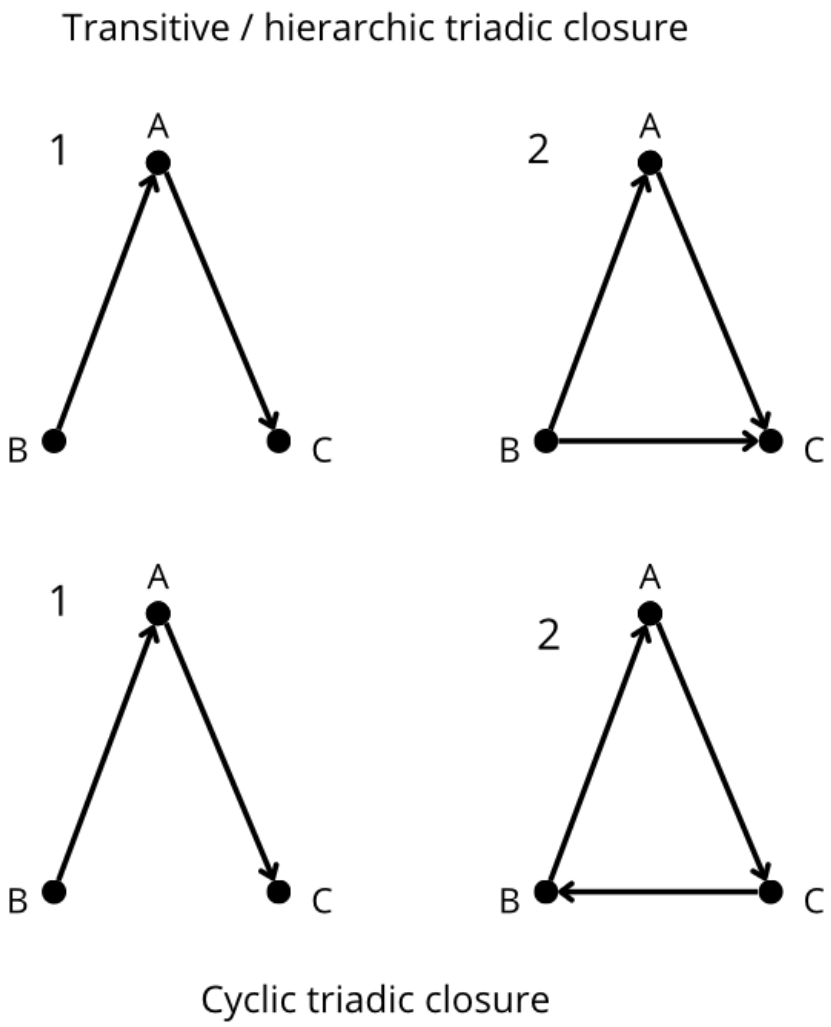
In a transitive (or hierarchic triadic closure) in contrast, B extends a link to A, and A extends a link to C. But in contrast to the situation before, it is B who closes the triad by extending a link to C. This form of closure indicates a hierarchy, since C receives two ties, and B extends two ties. A occupies an intermediate position and extends and receives a tie.

Why does B extend two ties, without being compensated by any incoming tie? One possible interpretation for hierarchic (transitive) triadic closure is 'redundancy in the presence of uncertainty' (Laumann and Marsden, 1982). Redundancy means that B prefers to relate information directly to C as well as to A via C, as she cannot be certain that the information is transferred. However, this explanation leaves open why B relates information to both A and C, while not receiving information back from them.

A possible interpretation of a transitive (or hierarchic triad) is that B wishes to connect to higher-standing actor C. The prestige conferred when relating to more prestigious actors, may convince actors to cooperate (Clark and Wilson, 1961, p. 133; Knoke, 1988, p. 315; Puffer and Meindl, 1992, p. 428). While a motive such as prestige or status may trigger A to link to C, it is unlikely that the embeddedness argument applies: C is not contributing, and thus, should be avoided by A.

This conceptualization of transitivity as a hierarchic constellation receives support from

Figure 2:
Triadic Closure in Directed Networks



other fields. The policy literature holds that transitive triads are hierarchical, whereas cyclic triads are horizontal (Ingold and Leifeld, 2016). Ethnographic research analyzes transitivity in marriage markets where wife-giving families gain prestige in by relating to higher-standing families (Hage and Harary, 1996). Transitivity is also very frequently observed in interpersonal networks (Block, 2015; Davis, 1963, 1970; Davis and Leinhardt, 1967). In inter-personal networks transitivity is usually interpreted as a psychological need for consistency in interpersonal relations: it is hard for actor A not to like C if her friend B already likes C.

In addition, the literature on inter-organizational networks highlights gaining status as an important motive for relating to other firms (Borgatti and Foster, 2003; Grandori and Soda, 1995; Mizruchi, 1993; Oliver and Ebers, 1998a; Podolny, 1993, 1994; Podolny and Page, 1998;

Podolny, Stuart, and Hannan, 1996). Organizations mitigate uncertainty and limit transaction costs by transacting with organizations of the same status (Podolny, 1994). Organizations occupy certain status positions. These positions are defined in relation to others. Ties to other employers are one of channels through which prestige is built. Transferring people from one organization to another is a common conduit of status (Podolny, 1993). From an individual perspective, higher-status referrers are important to access higher-status jobs (Lin, Ensel, and Vaughn, 1981). Organizations may value a status as a goal in itself, but status also comes with certain economic benefits. Highly prestigious organizations have lower advertising costs to convince consumers of the quality of their products, and lower costs for finance because they are preferred by banks. In the labor market, employees may accept lower salaries to work in a highly prestigious organization. Status also plays an important role in cooperative networks within firms, such as advice networks in law-firms (Lazega and Pattison, 1999).

Understanding how triads close may give us a better understanding regarding the form of the overall network. The presence of hierarchic triads involves vertical differentiation, while cyclic triads lead to clusters of interrelated organizational units (Laumann and Marsden, 1982). Thus, hierarchic (transitive) triads may lead to a hierarchic network, where the top actor has only incoming ties, the second actor receives only incoming ties except from the top actor and so forth (Davis, 1970). A perfect hierarchy obtains if all triads in a network are transitive. In random networks around 75% of the triads are hierarchic (transitive), whereas 25% are cyclic (Davis, 1970). Thus, for a network to show an above chance tendency towards hierarchy, more than 75% of the triads need to be transitive. In inter-personal relations, around 90% of the triads are found to be hierarchic.

3 Case: Referral networks

Referral networks are usually described as providing information on candidates not otherwise available. Employers ask trustworthy others about candidates because they are exposed to an information asymmetry when hiring. When hiring, it is difficult for employers to assess the abilities and work ethics of candidates, because potential workers have little incentive to reveal their true characteristics (Autor, 2008; Rees, 1966; Stigler, 1962). One way of learning about

candidates despite these information asymmetries is through common acquaintances referring candidates and providing trustworthy information.

Referrers provide employers with hard-to-observe information about candidates (e.g. regarding soft skills) while providing candidates with realistic information about the job and the organizations. This ensures a better fit of candidate and job (Bills, Stasio, and Gërxhani, 2017; Marsden and Gorman, 2001, p. 481; Montgomery, 1991; Russo et al., 2000). Better matches switch less, and thus, informal hiring may also result in lower turnover subsequently (Marsden and Gorman, 2001, p. 481; Russo et al., 2000). Referred candidates already passed a screen, tend to be better suited for the job and also may have more realistic job expectations (Bills, Stasio, and Gërxhani, 2017; Fernandez, Castilla, and Moore, 2000; Marsden and Gorman, 2001). Gains from informal hiring are particularly high, when errors are costly (Marsden and Gorman, 2001, p. 481).

Employers are an important source of such informal information (Saloner, 1985). It is for instance common to rely on reference letters when hiring (Abel, Burger, and Piraino, 2017). However, previous studies have focused on the role of a firm's current employees recommending candidates rather than on the role of other employers (Fernandez, Castilla, and Moore, 2000; Schram, Brandts, and Gërxhani, 2010). Referral networks among employers have received only scant attention so far (Bills, Stasio, and Gërxhani, 2017; Marsden and Gorman, 2001). This is surprising given the prevalent role references of previous employers play in most labor markets.

This is surprising, as employers are generally distrustful of 'outside information' such as schools (Miller and Miller, 1997). As referral networks circulate critical information about candidates, forming such referral networks poses a cooperation problem to employers (Gërxhani, Brandts, and Schram, 2013). After all, employers are potential competitors. How does an employer know she can trust a reference? A competitor may wish to get rid of employees that do not perform well, or may not want well-performing employees to switch employers. Building a referral network is a classical cooperation dilemma: All employers would be better off if referrals would convey trustworthy information so as to make sure non-performing employees are excluded from the labor market. However, every individual employer has a strong incentive not to contribute to the public good and to refer good candidates, and perhaps even, to refer bad

candidates.

Moreover, previous studies have analyzed the advantages associated with informal or formal channels, but usually take the existence of such channels for granted, and do not analyse how employers come to trust referrers. One exception is the seminal study by Gërxhani et al. based on experimental data. They show how the cost of ties affects how employers network forms (Gërxhani, Brandts, and Schram, 2013). Usually, formal and informal channels are compared with regard to their costs, quantity and quality of applications they generate: the number of applications is higher when advertising formally, but advertising jobs formally is also costly (Montgomery, 1991, p.1498; Rees, 1966, 560). Informal referrals in contrast tend to be more productive, particularly if referrers are employers and it is relatively cheap (Bishop, 1984). In general, firms balance different recruitment channels, optimizing the flow of applications depending on costs and quality (Russo et al., 2000, p. 675). Rees (1966, p. 560) compares hiring to a buying of a product with high variation in quality: buyers tend to search at the extensive margin (look at many different suppliers) when a good is highly standardized. In cases where quality varies considerably, i.e. when screening future employees, buyers concentrate on one supplier. This is for instance the case, when large investments in training are to be made, and when positions possess high levels of discretion; when a newly hired employee is difficult to discharge, and when wages and benefits to be paid are high. Moreover, the use of recruitment channels depends on labor market tightness. In tight labor markets, employers tend to recruit through formal channels (Bills, Stasio, and Gërxhani, 2017; Schram, Brandts, and Gërxhani, 2010).

4 Context: Swiss fiduciary and childcare sectors

I analyze referral networks in two different sectors in Switzerland. Switzerland is a small corporatist economy, where people tend to know each other ((Katzenstein, 1984). It is common practice to rely on references when hiring.

I selected two sectors, fiduciary and childcare, where employees are trusted with goods of high value and therefore need to be trustworthy. As discussed in the literature section, referrals should be of particular relevance in such sectors (Rees, 1966). Moreover, both sectors are

struggling with a lack of skilled labor. Interviewees said that establishing a trustworthy referral network in such a context was difficult, because employers may prefer to keep employees for themselves.

In terms of skill profiles and job tasks however, the sectors are fairly different: fiduciary sector needs medium- to high-skilled personnel with a good understanding of numbers. The childcare sector counts with low- to medium-qualified personnel, equipped with soft skills. The sectors also differ in terms of gender composition and the extent to which non-Swiss work in these sectors (see data in the annex): the fiduciary sector is predominantly male and Swiss, whereas the childcare sector is female and recruits also non-Swiss workers. Results that obtain in both sectors are therefore likely to generalize to other sectors, too.

5 Data and Operationalization

In 2021, I conducted an employer survey in the Swiss fiduciary sector and the childcare sector in the French-speaking canton of Vaud (Switzerland). Exploiting the fact that both sectors are organized in associations and employers know each other, I asked from which of their colleagues they value a reference on a prospective employee. Prior to conducting the survey, 25 qualitative interviews with employers in both sectors were conducted to understand their hiring practices (see annex for a list of interviewees and codebooks).

5.1 Fiduciary sector

In the fiduciary sector, the national association is organized into regional sub-sections. Employers tend to know each other in these sub-sections, because they need to attend a certain number of further education seminars to maintain their membership, e.g. on the most recent developments in tax law. I gathered network data on four regional (cantonal) sections of the national association of fiduciaries: Geneva, Basel-City, Fribourg and Neuchâtel-Jura. These sections were selected because they were of a relatively small size with maximally 150 fiduciary businesses. This ensured that checking which of the the other fiduciaries they trusted in the section was manageable for survey participants.

The exact wording of the survey question was the following: "We would like to ask of which other employers you value a reference particularly. From which of these fiduciary businesses do you regard a reference as particularly telling? Please select all fiduciary businesses from the below list, of which you value a reference. Multiple answers are possible."

I sent out the survey link via email on September 21, 2022, followed by a reminder on October 6. 2022. The email addresses I received from the national association pertained to the directors of the organizations. I then followed up with individual phone calls to ensure I had an adequate response rate to have a more or less complete picture of all four networks (response rate of 0.69 for Geneva (92/134 organizations); response rate of 0.64 for Basel (96/149 organizations); a response rate of 0.60 for Fribourg (34/57 organizations), and a response rate of 0.65 for Neuchâtel / Jura (34/ 52 organizations).

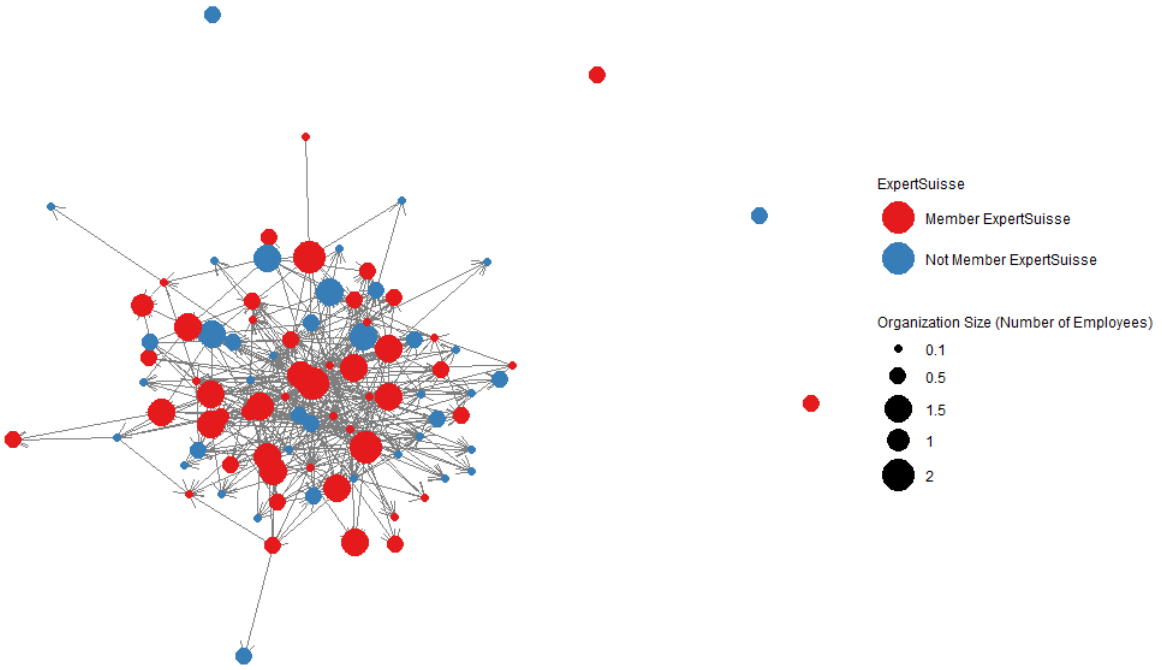


Figure 3: Network plot for the network of Geneva fiduciaries

The graph shows the referral network of fiduciaries in Geneva. The nodes represent an organization, whereas an arrow indicates that the sender values a reference from the receiver. The color of the nodes represents whether or not the organization is member of a prestigious professional association (ExpertSuisse), and the size of the nodes reflects the size of the organizations.

The list of organizations included information on whether the membership with Treuhand|

Suisse is a personal one, or a corporate membership. This allowed checking if the organizations that didn't answer the survey are missing at random (MAR) or not. The association between 'missing' and the type of membership is insignificant in two of the four networks, Geneva and Neuchâtel-Jura (Chi-Squared test doesn't reach a significance of 0.05).

5.2 Childcare sector

In the childcare sector, I worked with the the association in the French-speaking canton of Vaud. The administrative unit responsible for overseeing childcare facilities (OAJE) provided us with a list of all licensed day-care centres in the canton of Vaud (605 unique email addresses of 743 day-care centres). The email address was that of the director of the centre. Again, these 743 organizations are split into local networks. Employers tend to know each other in these sub-sections, because they need to coordinate in various matters to get funding. I gathered network data on all local sections of the cantonal association except the one for Lausanne. The Lausanne network included over 200 organizations and it was deemed too daunting for employers to go through a list of more than 200 organizations to check whose referrals they valued. In this paper I only analyse the four largest ones, due to constraints of time and space.

I sent out the first email inviting respondents to answer our survey on November 16, 2021 and followed up with four reminders. In total I received 359 completed surveys. The response rates in our four networks were 21 out of 29 for Enfants Chablais (0.72), 30 out of 49 for EFAJE (0.61), 36 out of 64 for AJEMA (0.56), and 21 out of 42 for RAT (0.50).

Below we see a network with all the childcare centers in the network called 'AJEMA'. The nodes represent organizations and an arrow indicates that a sender values the receiver regarding a reference. The color of the nodes indicates whether (red) or not (blue) an organization is part of a local network and receives public subsidies. The size of the nodes reflects the size of the organizations.

The list of organizations included information on the number of childcare places (Capacité Totale), organization type (Type), Location (Localité), legal form (Forme Juridique), whether an organization is part of a network (Réseau) and opening hours (Libellée Plage Ouverture). This allows checking if the organizations that didn't answer the survey differ from those that did.

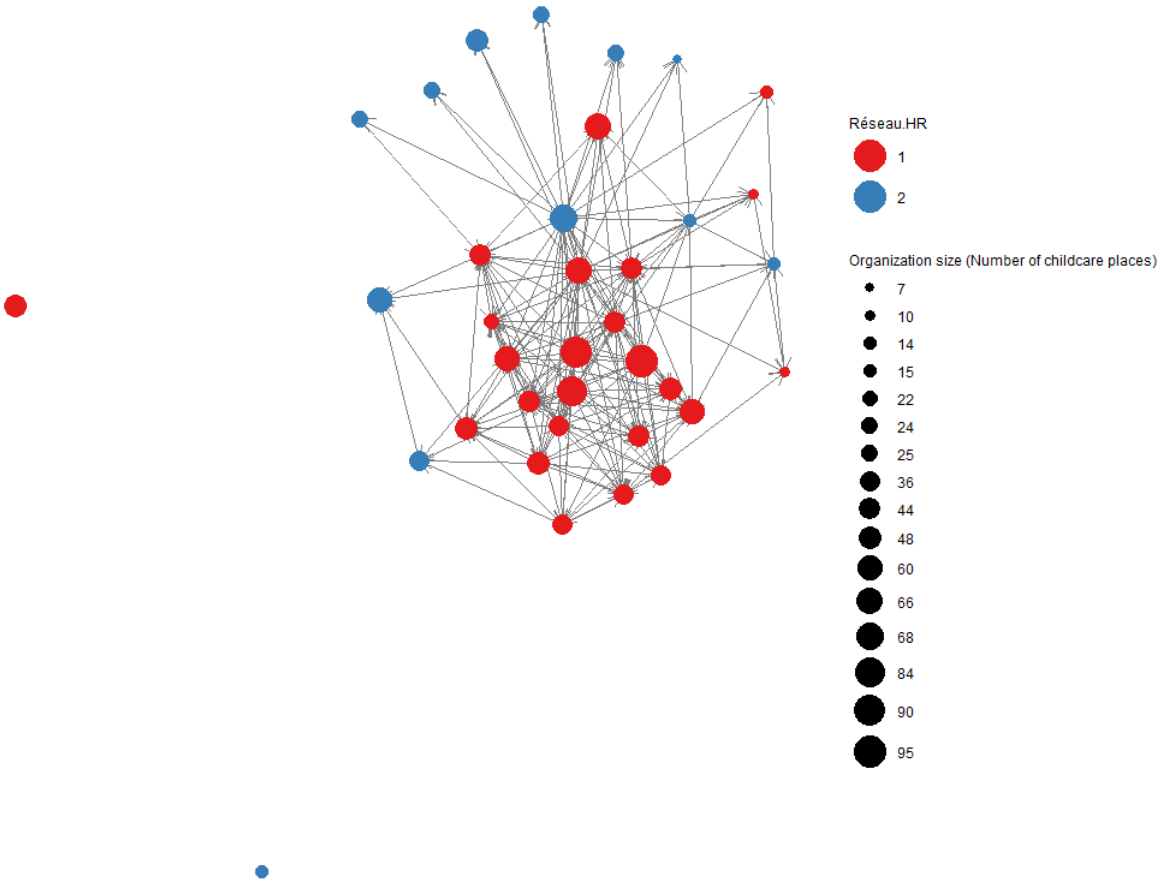


Figure 4: Network plot for the network of childcare centers in the newtork AJEMA

Checking the association between 'missing' and the variables I have for all the organizations with a Chi-Squared test shows no significant relationship (association does not reach a significance of 0.05) for any of the variables in any of the networks. The only exception is the the variable 'opening hours': there is a significant relationship between opening only on mornings and not having answered the survey.

5.3 Operationalization

Hierarchical closure is modelled with an edgewise shared partner term (gwesp). This term captures the tendency of connected dyads to share a third partner. The term is geometrically weighted discounting every additional shared partner at a constant factor (A $\rightarrow$ B $\rightarrow$ C $\leftarrow$ A). If triadic closure in cooperative settings is about building local hierarchies, I would expect this term to be positively significant. In the fiduciary sector, I include a measure on the prestige of

organizations to better understand hierarchical processes in network formation. In particular, I use membership in a prestigious association (ExpertSuisse) as an indication of prestige among organizations. I would expect that prestigious organizations are better connected, that is, that they are more trusted referrers, but also that they have a more trustworthy network.

Embeddedness is modelled with a 3-cycle. This term captures that three actors are related in cycle (A $\rightarrow$ B $\rightarrow$ C $\rightarrow$ A). I also include a term for dyadic reciprocity (mutual) (A $\leftrightarrow$ B). If triadic closure in cooperative settings is about relating information on cooperators, I would expect this term to be positive.

I include a term controlling for open triads with a dyad-wise shared partner term (gwdsp). This term captures the tendency of unconnected dyads to share a third partner. Again, I include the term as a geometrically weighted term, discounting every additional shared partner at a constant factor (A $\rightarrow$ B $\rightarrow$ C). I would expect this term to be negative in cooperative settings, because previous research indicates that cooperation evolves better if triads are closed.

I also control for the most prominent alternative explanations for the emergence of cooperation in competitive settings as highlighted in the literature. A first prominent argument is that organizations cooperate in order to access resources (Borgatti and Foster, 2003, p. 997; Gulati and Gargiulo, 2000, p.1; Mizruchi, 1993, p. 47; Oliver and Ebers, 1998b, p. 575; Pfeffer, 1987). I use the number of employees as an indication of an organization's size to proxy its access to resources. I would expect larger organizations to be better connected, that is, that they are more trusted referrers, and also that they have a more trustworthy network.

A second prominent alternative explanation is homophily: actors rather cooperate with similar actors, than dissimilar actors. I conceptualized homophily as offering the same services in the fiduciary sector, and in the childcare sector as the type of organization (private or public).

I include various additional control variables, at the level of the organization (hiring difficulty, investment in training) and at the level of the respondent (role in the company, hiring experience, influence on hiring decisions, age, gender, education at secondary and tertiary level and nationality). I included these variables as node covariates (numeric variables), node factors (categorical variables), or edge-covariates (shared characteristics of nodes). A summary of the covariate data for all networks can be found in the annex.

Moroever, I included additional endogenous control variables, capturing relevant network processes so as to increase the model fit. I control for popularity, meaning the tendency of well-connected nodes to become even more connected (gwidegree), and I control for the general level of activity of nodes (gwodegree). I equally control for higher-level clustering with a cycle 4.

6 Estimation

The networks are modeled with exponential random graph models (ergms). In contrast to other approaches, ergms allow including network statistics, capturing network dynamics such as the tendency for generalized reciprocity or transitivity, as independent variables. Network formation is thus predicted based on endogenous network dynamics as well as exogenous factors such as individual and shared actor characteristics. The interpretation of the ergm corresponds to the interpretation of a logistic regression model of the formation of ties, where some of the independent variables represent statistics on structures incorporating other ties in the network.

The probability of observing a particular network is given by the following probability density function, where N specifies the network, and the coefficients to be modeled:

$$P(N,\theta) = \frac{exp\{\theta^T h(N)\}}{\sum_{N^* \varepsilon N} exp\{\theta^T h(N^*)\}}$$

P(N, θ) denotes the probability to observe this particular network. h(N) are the network statistics specified by the researcher. They may include endogenous (e.g. edgewise shared partners), as well as exogenous characteristics (e.g. number of employees). θ is a vector of the estimated coefficients. The symbol T indicates that a transpose is taken. The numerator, $\exp\{\theta^T h(N)\}$, is the exponentiated sum of the weighted statistics of the observed network (i.e., the one to be modeled). The denominator $\sum_{N^* \varepsilon N} exp\{\theta^T h(N^*)\}$ sums these exponentiated sums of weighted statistics over all the possible topologies in the network. Thus, the whole expression is the probability of observing this particular network depending on the statistics included and given all the other possible networks that might have been observed. This expression is problematic for estimation because the set of all possible permutations of the network with the

same number of nodes is very large, even for small networks.

Therefore, approaches to estimate network models rely on simulation. To determine parameter size, artificial networks were first sampled. Simulating new networks given the selected parameters is referred to as network sampling. Network sampling can be performed based on different sampling procedures (i.e., Markov Chain Monte Carlo (MCMC) sampling procedure based on Metropolis-Hastings algorithm as used here). Network sampling is stopped when the networks do not change anymore and approximate the parameters initially determined.

Next, the sampled networks, which are as close as possible to that empirically observed, were identified. For any sampled network, closeness to the observed network was therefore evaluated by comparing its sampling statistics to those of the observed network. The difference between the empirically observed network and the sampled ones was minimized by sampling over and over again and by accepting the parameter configuration yielding the most accurate networks (i.e. maximum likelihood (MLE)). This procedure is called MCMC-MLE and is commonly used to estimate ergms.

The ergm models presented here are based on MCMC network sampling and on MLE estimation. Figures in the annex show how the actually observed networks (black line) compare to the networks drawn from the ergm (confidence intervals) across different network statistics and that the fit is satisfactory for all eight networks.

7 Results

The endogenous network dynamics characterizing the networks are similar across all eight networks. The tendency for triads to remain open captured with a gwdsp term is negatively significant in all eight networks, except for the Basel network where it is not significant. This is in line with much of the literature that argues that triadic closure is key in maintaining cooperation. This also indicates that sharing references is indeed a a form of cooperation requiring trust.

The main finding is that there is a tendency towards hierarchic triadic closure. Hierarchic triadic closure as indicated by a positive and significant edgewise-shared partner term (gwesp) plays a role in all four fiduciary networks (Geneva, Basel and Neuchâtel-Jura and Fribourg) and in two out of four childcare networks (EFAJE, AJEMA). It is positive but statistically not

	Basel	Fribourg	Geneva	Neuchâtel-Jura
edges	5.26	−1.94	4.66	60.41**
	(8.85)	(16.52)	(8.24)	(22.51)
nodecov.NumEmp	0.01*	−0.00	−0.01	0.02
	(0.00)	(0.01)	(0.01)	(0.01)
nodefactor.ExpSuisse.1	0.15**	0.34*	0.36***	0.12
	(0.05)	(0.15)	(0.10)	(0.14)
nodecov.Hiring_Difficult	0.01*	−0.00	0.00	−0.03**
	(0.00)	(0.01)	(0.01)	(0.01)
nodefactor.Trainingfirm.1	0.11**	0.13	0.10	−0.17
	(0.04)	(0.12)	(0.06)	(0.11)
nodefactor.Role.2	0.09	0.26	−0.22	−0.42
	(0.10)	(0.24)	(0.12)	(0.23)
nodefactor.Role.3	0.23*	0.04	0.13	−0.71*
	(0.11)	(0.31)	(0.12)	(0.30)
nodefactor.Role.4	0.25*	−0.21	0.21	−0.65*
	(0.10)	(0.31)	(0.11)	(0.31)
nodecov.Influence_Hiring	−0.01	0.27*	−0.16**	−0.01
	(0.03)	(0.12)	(0.05)	(0.09)
nodecov.Experience_Hiring	−0.02	0.03	0.03**	0.00
	(0.01)	(0.03)	(0.01)	(0.03)
nodecov.Age	−0.00	−0.00	−0.00	−0.02**
	(0.00)	(0.00)	(0.00)	(0.01)
nodefactor.Gender.2	−0.01	0.07	−0.04	0.54*
	(0.08)	(0.11)	(0.08)	(0.27)
edgecov.Shared_Services	0.01	0.02	0.05***	0.04
	(0.02)	(0.03)	(0.01)	(0.03)
edgecov.Shared_Education	0.02	−0.25	0.20	0.22
	(0.07)	(0.14)	(0.13)	(0.21)
edgecov.Shared_Nationality	0.21	0.66	0.12	0.02
	(0.13)	(0.35)	(0.10)	(0.35)
edgecov.Shared_Gender	−0.11	−0.25	0.05	−0.24
	(0.14)	(0.21)	(0.12)	(0.30)
reciprocity (mutual)	0.57*	−0.16	0.68*	−0.28
	(0.26)	(0.36)	(0.34)	(0.39)
hierarchically closed triads (gwesp)	1.38***	0.71**	0.99***	1.08***
	(0.08)	(0.25)	(0.10)	(0.25)
open triads (gwdsp)	0.00	−0.29***	−0.16***	−0.24***
	(0.01)	(0.04)	(0.02)	(0.04)
popularity (gwideg)	2.24***	3.03	−0.40	0.41
	(0.66)	(3.42)	(0.37)	(0.81)
activity (gwodeg)	−2.07***	−4.25***	−3.42***	−1.72**
	(0.34)	(0.93)	(0.36)	(0.66)
horizontally closed triads (cycle3)	−0.23	0.20	−0.19	0.18
	(0.18)	(0.21)	(0.27)	(0.25)
cycle4	−0.12***	−0.04	−0.02	−0.06
	(0.03)	(0.04)	(0.07)	(0.05)
AIC	2962.49	863.03	2529.22	863.44
BIC	3133.32	983.58	2698.00	983.99
Log Likelihood	−1457.24	−407.52	−1240.61	−407.72

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 1: Results for the exponential random graph models for the four fiduciary networks. Estimation with MCMC-MLE.

	EFAJE	AJEMA	RAT	ENFANT
edges	-1.59	-3.68^{***}	-3.09	1.44
	(0.85)	(0.83)	(2.26)	(2.23)
nodefactor.Réseau.HR.2	-0.27	0.01	0.23	-0.20
	(0.40)	(0.15)	(0.33)	(0.57)
nodecov.Years_worked	-0.02	-0.00	0.03	-0.00
	(0.01)	(0.01)	(0.02)	(0.02)
nodefactor.Gender.2	0.07	-0.21	-0.79	0.99^{*}
	(0.17)	(0.18)	(0.54)	(0.40)
nodefactor.Role.3	-0.29	0.23	0.73^{*}	-0.07
	(0.18)	(0.21)	(0.36)	(0.48)
nodefactor.apprentices...yes_no.2	0.07	0.17	0.64	-0.62
	(0.12)	(0.15)	(0.36)	(0.34)
nodefactor.apprentices...yes_no.3		0.16	-0.89	
		(0.22)	(1.13)	
nodecov.Influence_hiring	-0.06	0.05	-0.22	-0.43^{**}
	(0.05)	(0.05)	(0.22)	(0.14)
nodecov.Num_Hirings_done	0.00	0.01	0.04^{*}	0.01
	(0.01)	(0.01)	(0.01)	(0.01)
nodecov.Hiring_Difficult	0.00	0.03	0.16	0.07
	(0.04)	(0.05)	(0.17)	(0.17)
nodecov.Capacité.totale	0.00	0.01^{**}	-0.00	0.02^{*}
	(0.00)	(0.00)	(0.00)	(0.01)
edgecov.Shared_Structures_Type	0.25	0.05	0.39	0.23
	(0.14)	(0.17)	(0.28)	(0.34)
edgecov.Shared_Nationality	0.21	0.05	-1.30^{*}	-0.40
	(0.22)	(0.16)	(0.53)	(0.63)
edgecov.Shared_Réseau.HR	0.09	0.45^{*}	0.52	0.46
	(0.40)	(0.18)	(0.26)	(0.56)
reciprocity (mutual)	0.08	0.77^{*}	0.04	0.58
	(0.48)	(0.32)	(0.51)	(0.43)
open triads (gwdsp)	-0.25^{***}	-0.29^{***}	-0.29^{**}	-0.29^{**}
	(0.04)	(0.03)	(0.09)	(0.09)
hierarchically closed triads (gwesp)	0.85^{***}	1.08^{***}	0.39	0.51
	(0.14)	(0.27)	(0.31)	(0.50)
popularity (gwideg)	1.47	0.36	9.97^{*}	-0.07
	(0.81)	(0.64)	(5.05)	(1.29)
activity (gwodeg)	-1.00	-2.55^{***}	0.94	-0.27
	(0.67)	(0.68)	(1.04)	(1.35)
horizontally closed triads (cycle3)	0.47	0.44^{*}	0.21	0.38
	(0.27)	(0.18)	(0.38)	(0.26)
cycle4	-0.07	-0.05	-0.13	-0.12^{**}
	(0.04)	(0.03)	(0.12)	(0.04)
AIC	561.04	886.73	392.76	398.89
BIC	656.41	994.64	477.61	475.59
Log Likelihood	-260.52	-422.36	-175.38	-179.45

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table 2: Results for the exponential random graph models for the four childcare networks. Estimation with MCMC-MLE.

significant in the other two childcare networks (RAT, Enfants Chablais).

There is no tendency towards horizontal triadic closure. The term three-cycle is not significant in any of the fiduciary nor the childcare networks, with the exception of the AJEMA network, where it is positively significant at the 5% level. In addition, dyadic reciprocity captured with the term mutual is not significant in five out of eight networks (Fribourg, Neuchâtel-Jura, EFAJE, RAT, Enfants Chablais), and only positively significant at the 5 % in the other three networks (Basel, Geneva, AJEMA).

There is a clear tendency towards hierarchical, rather than horizontal triadic closure. Earlier, it was suggested that this form of triadic closure might reflect a desire of actors to connect to a higher standing actor. In contrast, cyclic triads might reflect the availability of information about an actor's cooperative behavior. In line with this reading is the fact that prestige in the fiduciary sector also has a positive and significant effect on being connected in three out of the four networks (Basel, Fribourg, Geneva). Unfortunately, we lack a comparable measure for prestige in the childcare sector.

7.1 Prestige

I analyze the role of prestige further to better understand how it influences network formation, looking closer at prestigious organizations in the fiduciary sector connect in triads. First, I analyzed if prestigious actors are also more likely to be in a transitive triad. Thus, I extracted the neighborhood of all nodes in a network, and counted the number of transitive triads nodes were part of. I normalized the number of transitive triads with the total number of connected triads (cyclic and transitive). I find a correlation of 0.7905, statistically significant with a p-level of 0.00535 between an organization being prestigious and its share of transitive triads, based on a logistic regression.

These results suggest that prestigious organizations are more likely to be in a hierarchically closed triads, compared to non-prestigious organizations.

I then evaluated if cooperation is more frequent across different levels of prestige, than among organizations of the same level of prestige. This dynamic seems to characterize the network in Geneva, as indicated by the positive absolute difference term on the category (ab-

Parameter	Estimate	Std. Error	z value	Pr(¿—z—)
mu (Intercept)	-2.35	0.23	-10.08	0.00
mu (Prestige)	0.79	0.28	2.78	0.01
phi (Precision)	0.30	0.05	6.25	0.00
nu (Exceedance)	-4.08	0.60	-6.82	0.00
2.5% CI (Intercept)	-2.81			
97.5% CI (Intercept)	-1.89			
2.5% CI (attribute$_v alues$)	0.23			
97.5% CI (attribute$_v alues$)	1.35			

Table 3: Beta Regression Coefficients with Confidence Intervals

sdiffcat) membership in the prestigious association ExpertSuisse. The absdiffcat-term is insignificant in the network for Basel, but the effect of prestige remains significant. For the Neuchâtel-Jura network and the Fribourg network, both prestige terms become insignificant, when including the absolute difference term.

8 Discussion

In employer referral networks, triads exhibit a tendency towards hierarchic closure. In contrast, there is not any evidence for horizontal closure in employer referral networks. This finding in line with the literature arguing that third actors play an important role in securing cooperation between any two actors. However, much of the literature argues that third actors are important because they transmit information on non-cooperators. Our finding that triads are structured in a hierarchical, rather than a horizontal manner, challenges this assumption.

Further analyzing the role of exogenous prestige in these triads shows that prestigious organizations are more likely to be in hierarchical, rather than horizontally connected triads. This suggests that an additional rationale, relevant in cooperation is that actors cooperate in order to connect to more prestigious actors. This motive has been prominent in the literature on inter-firm cooperation.

-¿ what does this mean for the literature

These results likely generalize to other instances of cooperation. Employer referral networks are a fairly general instance of employer cooperation, and it is likely that similar dynamics characterize other employer cooperation networks. Moreover, the two sectors analyzed (childcare

and fiduciary) are fairly different in terms of tasks and composition. We therefore think that prestige and hierarchical closure are a feature characterizing cooperation beyond the case we look at.

9 Conclusion

The literature argues that third actors support dyadic cooperation by relating trustworthy information and reducing sanctioning costs. This paper analyses how triads close (cyclic or transitive) in order to shed further light on the role of these third actors. Analyzing employer referral networks, I find that triads close in a hierarchic way. Moreover, as much of the literature on inter-firm cooperation, it finds that prestige plays a role in these referral networks. Zooming in on the role of prestige in triadic closure shows that prestigious actors are more frequently involved in hierarchic triads, than non-prestigious actors.

Or results suggest that cooperation in networks may follow a dynamic that is quite distinct from the one observed in dyadic cooperation. Cooperative networks are characterized by hierarchic triadic closure, rather than dyadic or triadic (generlaized) reciprocity. Cooperation in larger contexts is achieved by building localized hierarchies. This contrasts with the literature analyzing dyadic cooperation, emphasizing reciprocity as an important dynamic to achieve cooperation.

Based on our results, it is likely that the role of third parties extends beyond providing truthful information on potential cooperators. Information on non-cooperators can be circulated in cyclic and hierarchic triads equally. However, building prestige is more easily achieved in hierarchic triads. These results thus suggest that the role of 'embeddedness' in cooperation should be re-evaluated.

The absence of open triads in employer referral networks has important distributional effects. In contrast to a network in which there are many open triads, an employer in a network with many closed triads wishes to get the information from at least two sides before he trusts a reference. This also makes accessing a job eventually harder. Moreover, the dominance of hierarchic triadic closure has important distributional effects. In a network with exclusively hierarchically closed triads, the whole network turns hierarchic. This means that the top actor

only receives incoming ties, and the second actor receives only incoming ties except for the top actor.

We cannot entirely disentangle the relation between prestige and hierarchic triadic closure. From the outset, transitive traidic closure could establish hierarchies which consequently lead to different levels of prestige. Alternatively, it could be that differences in prestige promotes hierarchic triadic closure. With our cross-level data we cannot evaluate which antecedes teh other. Future research should focus on better understanding the relaiton between prestige and hierarchic triadic closure.

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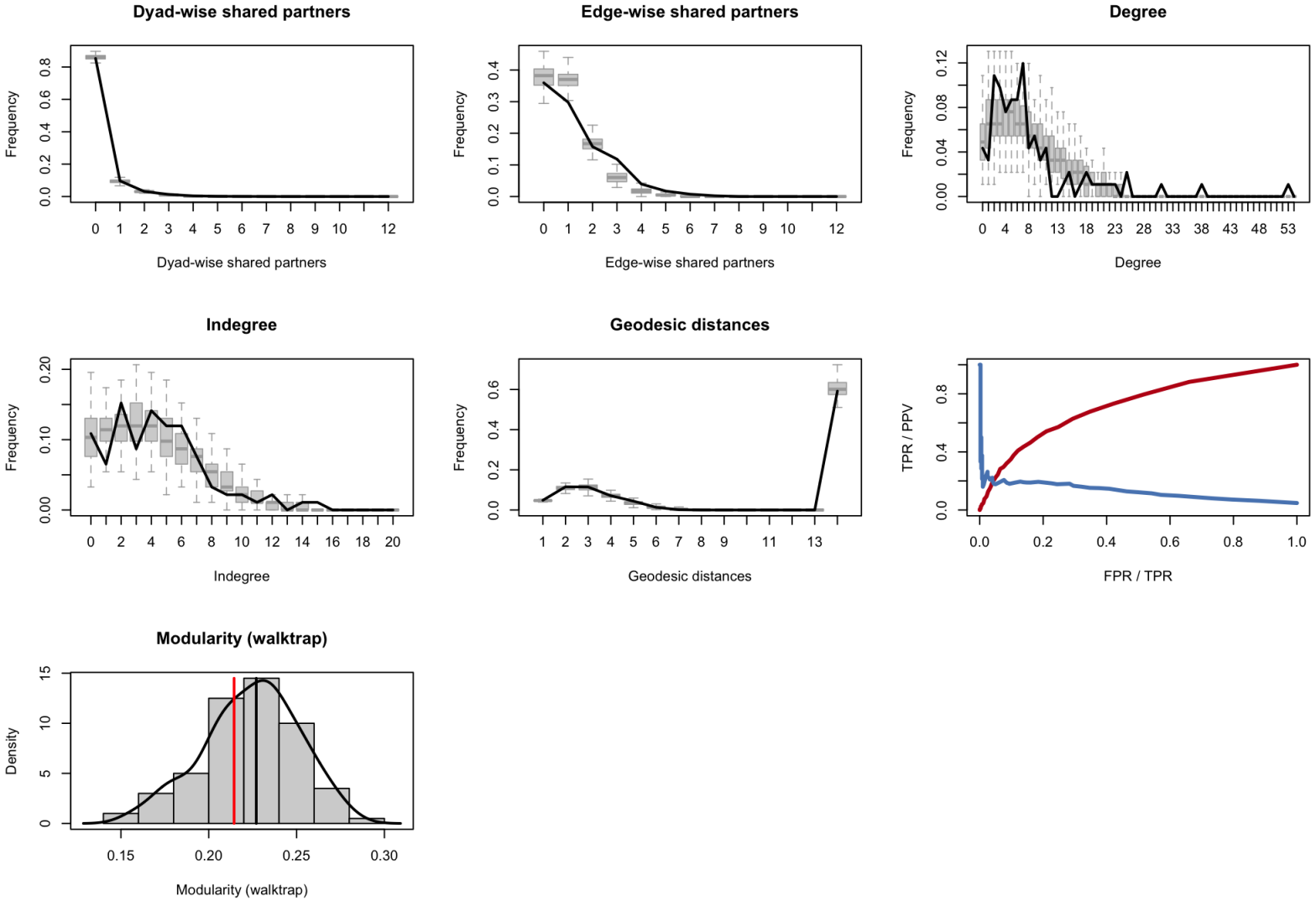
Appendix: Supplementary Material

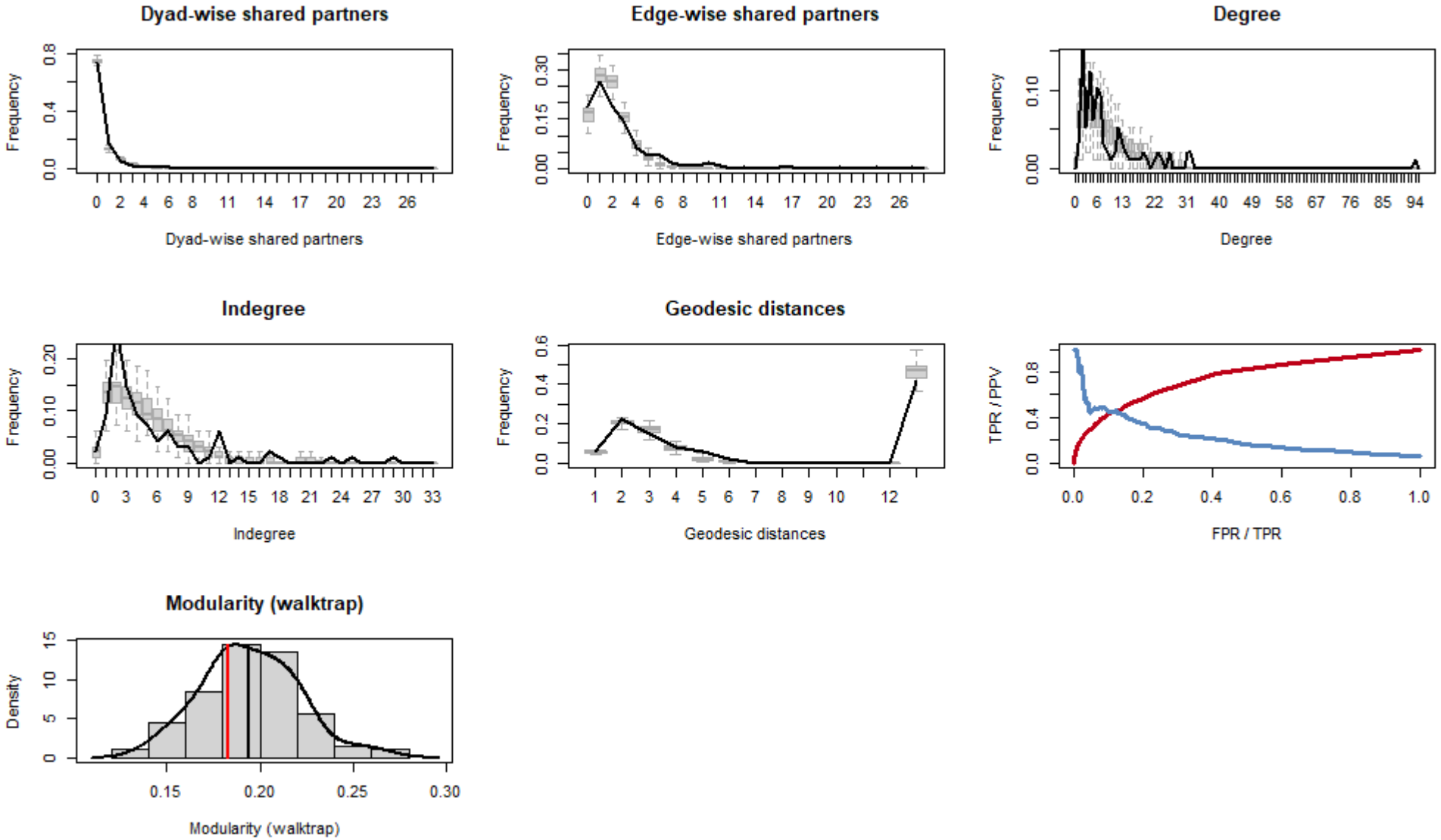
9.1 Goodness of fit plots for the fiduciary networks

Figure A.1: Goodness of fit plot for Geneva network main model



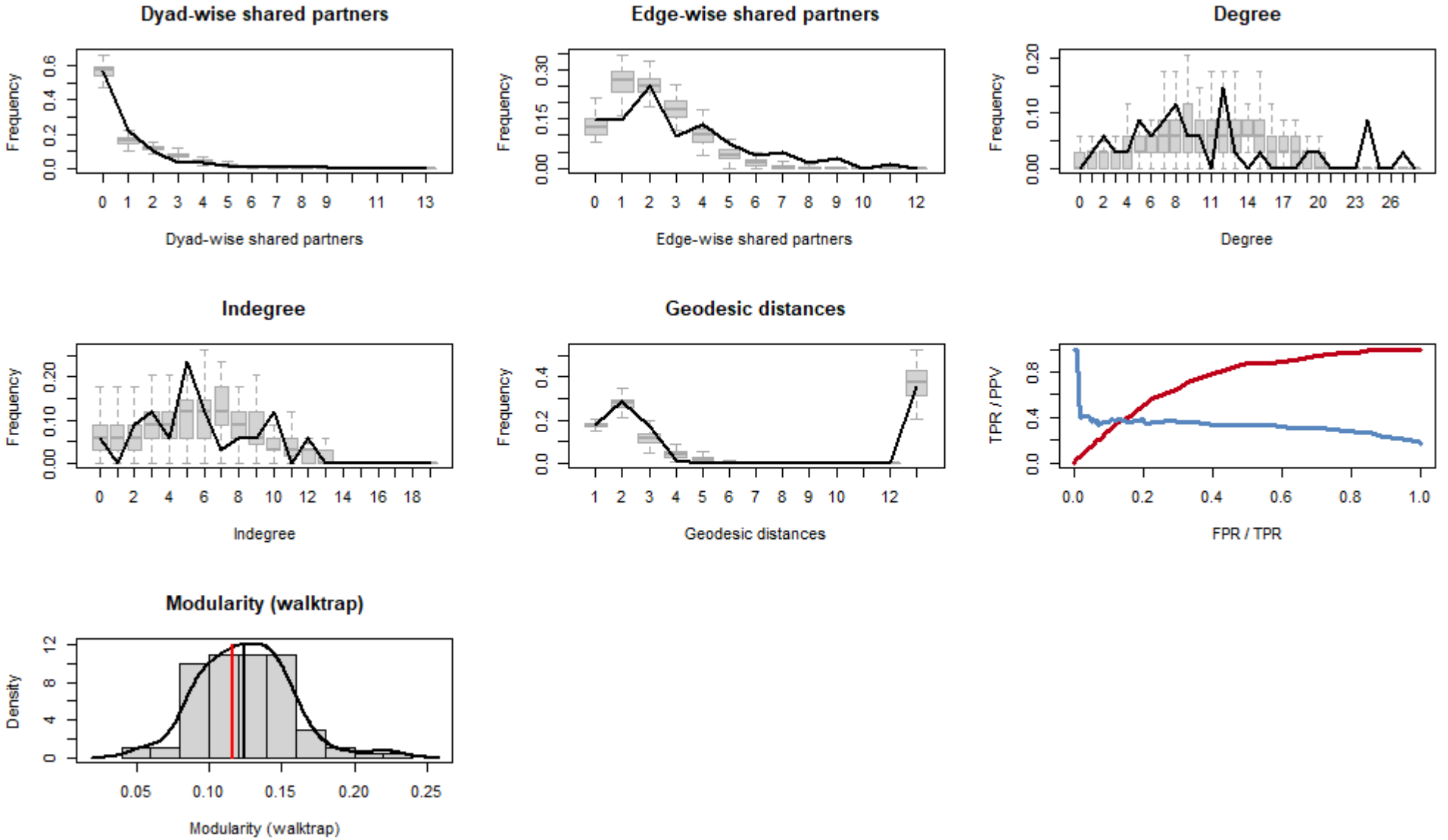
Notes: This figure shows how well the simulated networks correspond to the actually observed one.

Figure A.2: Goodness of fit plot for Basel network main model



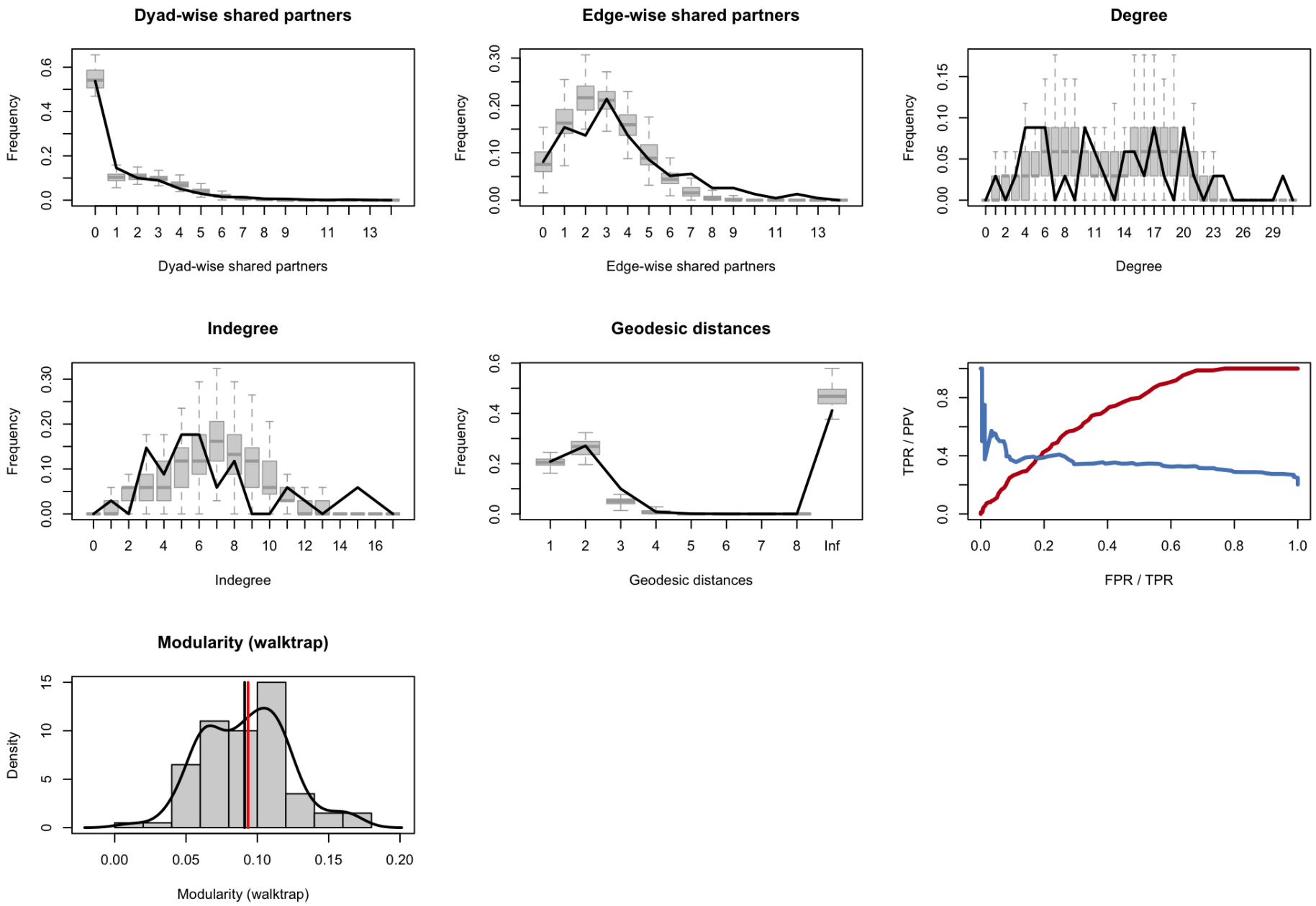
Notes: This figure shows how well the simulated networks correspond to the actually observed one.

Figure A.3: Goodness of fit plot for Neuchâtel-Jura network main model



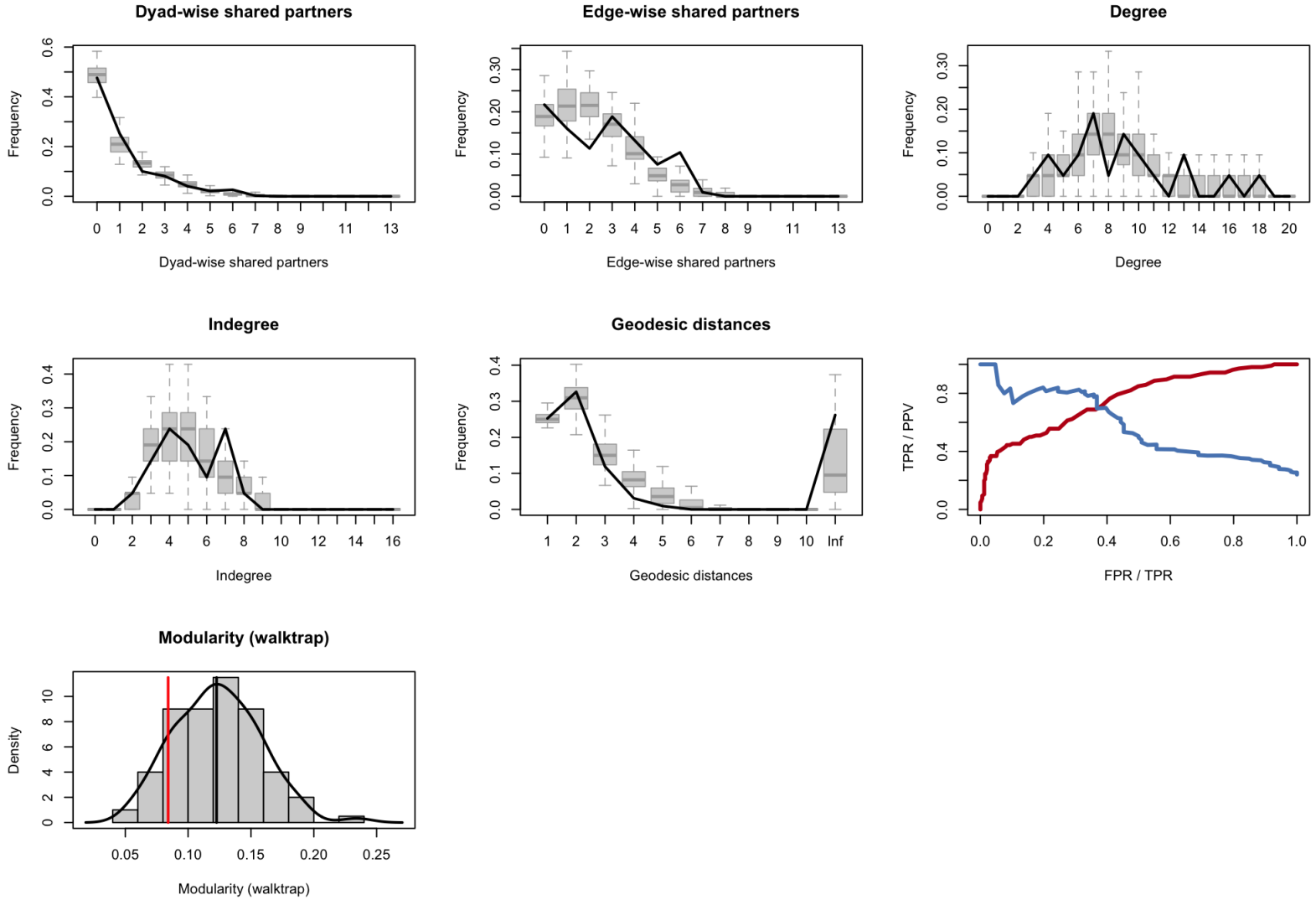
Notes: This figure shows how well the simulated networks correspond to the actually observed one.

Figure A.4: Goodness of fit plot for Fribourg network main model



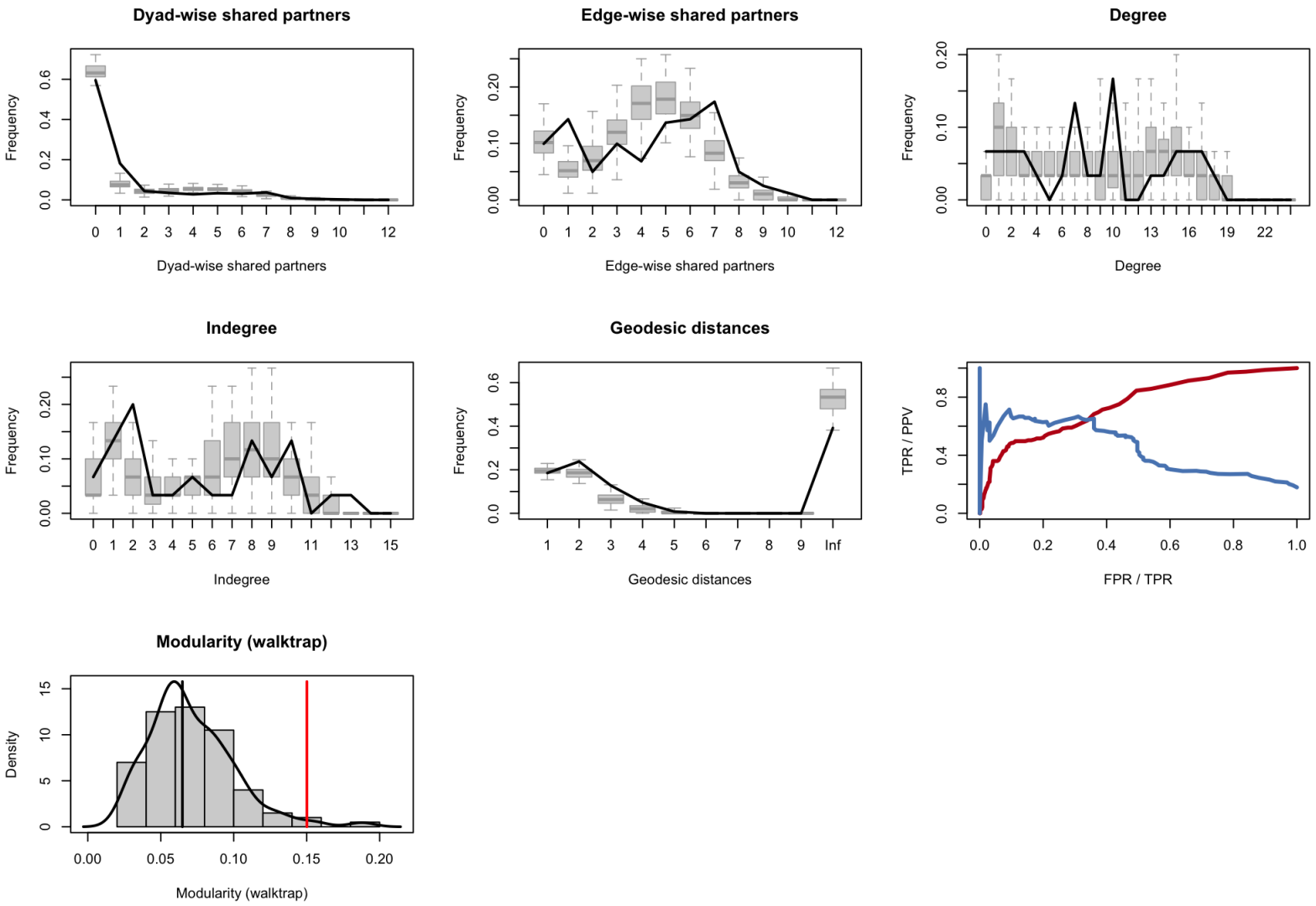
9.2 Goodness of fit plots for the childcare networks

Figure A.5: Goodness of fit plot for RAT network main model



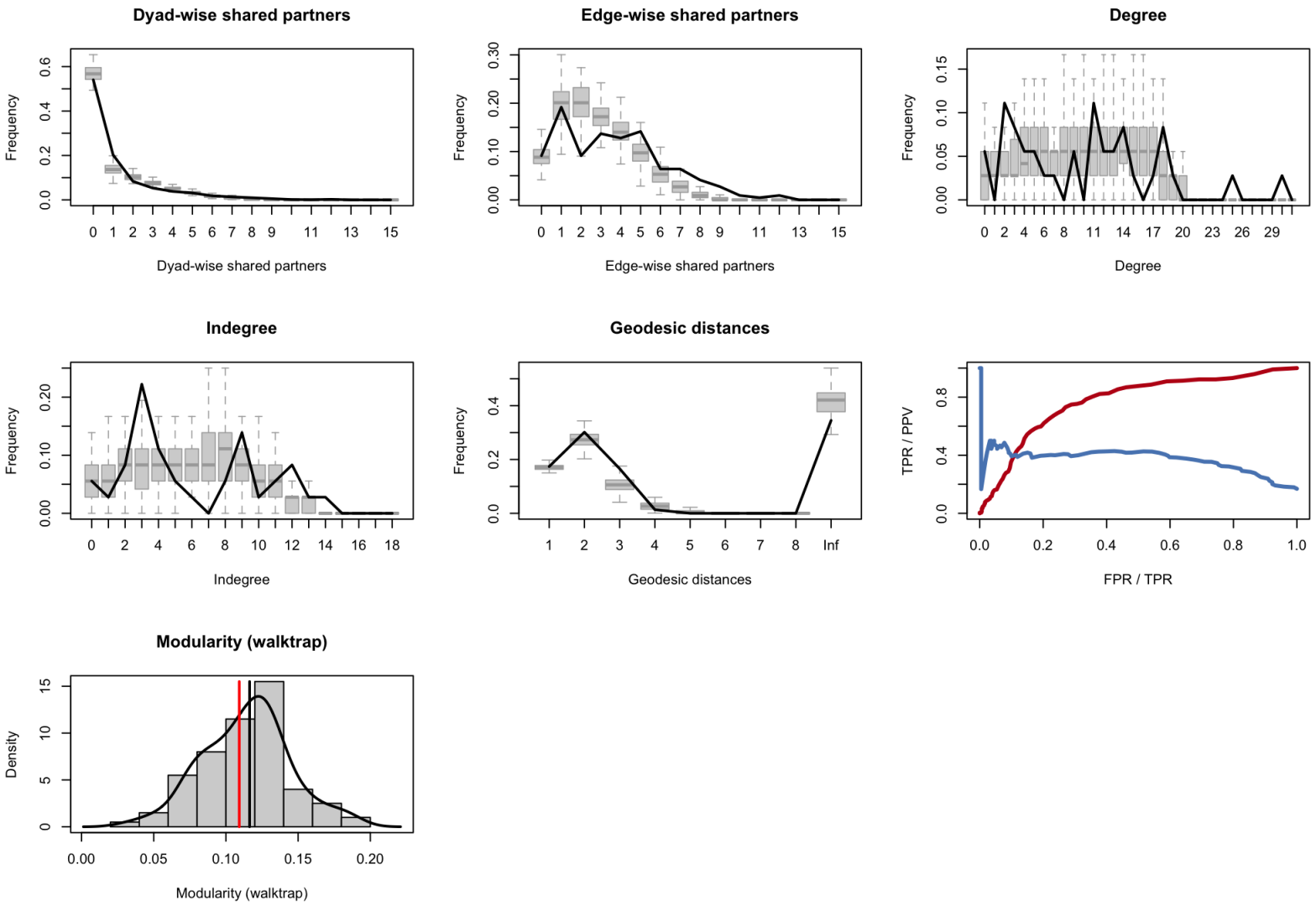
Notes: This figure shows how well the simulated networks correspond to the actually observed one.

Figure A.6: Goodness of fit plot for EFAJE network main model



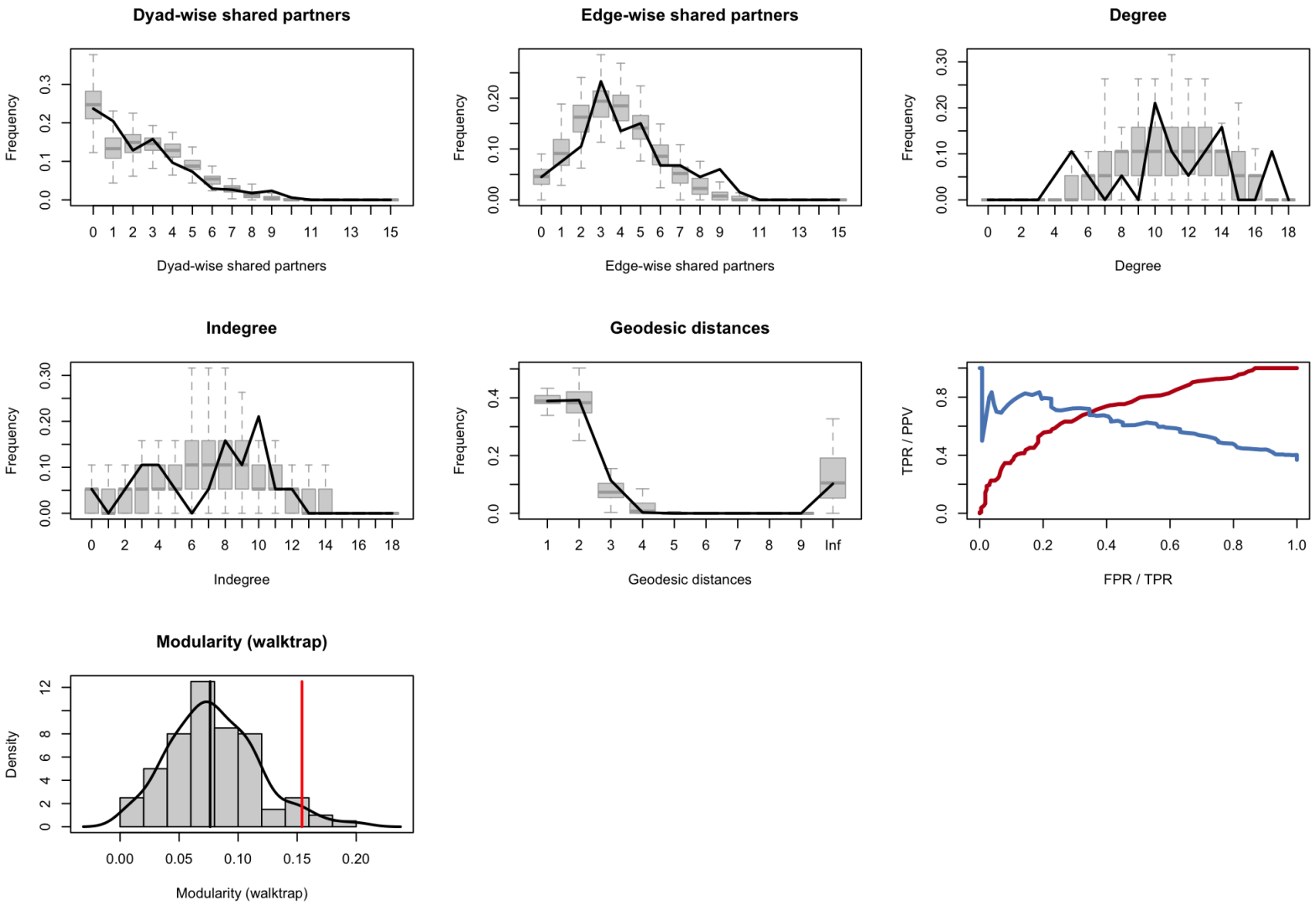
Notes: This figure shows how well the simulated networks correspond to the actually observed one.

Figure A.7: Goodness of fit plot for AJEMA network main model



Notes: This figure shows how well the simulated networks correspond to the actually observed one.

Figure A.8: Goodness of fit plot for Enfants Chablais network main model



Notes: This figure shows how well the simulated networks correspond to the actually observed one.

9.3 Descriptive Statistics Covariate Data Fiduciary Networks

Table A.1: Covariate Data Fiduciary Network Basel

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	FrequencyHiring	3.00	3.26	3.13	0.32	0.00	20.00	1.00	5.00	96	5
2	NumberEmployeesTot	6.00	7.72	6.01	0.61	0.00	24.00	3.00	11.00	96	21
3	CurrentRole	3.00	2.88	1.01	0.10	1.00	4.00	2.25	4.00	96	2
4	NumServicesProvided	9.00	7.15	4.32	0.44	0.00	14.00	4.00	10.00	96	0
5	InfluenceHiring	3.00	3.13	1.05	0.11	1.00	4.00	3.00	4.00	96	4
6	DifficultHiring	11.00	10.82	5.87	0.60	0.00	20.00	6.00	16.00	96	11
7	App	0.00	0.27	0.45	0.05	0.00	1.00	0.00	1.00	96	21
8	Age	1971.00	1970.46	10.71	1.09	1945.00	2000.00	1962.00	1977.00	96	25
9	Nationality	1.00	2.70	5.51	0.56	1.00	22.00	1.00	1.00	96	25
10	MemberExpertSuisse	0.00	0.44	0.50	0.05	0.00	1.00	0.00	1.00	96	21
11	EducationSecondary	2.00	1.24	1.07	0.11	0.00	3.00	0.00	2.00	96	0
12	EducationTertiary	1.00	1.06	1.34	0.14	0.00	6.00	0.00	2.00	96	0

Table A.2: Covariate Data Fiduciary Network Fribourg

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	FrequencyHiring	3.00	4.00	3.48	0.60	0.00	15.00	2.00	5.00	34	3
2	NumberEmployeesTot	4.00	7.33	7.02	1.20	1.00	25.00	3.00	9.00	34	7
3	CurrentRole	3.00	2.88	0.83	0.14	1.00	4.00	2.00	3.00	34	2
4	NumServicesProvided	9.50	7.71	4.43	0.76	0.00	13.00	7.25	10.75	34	0
5	InfluenceHiring	3.00	3.09	0.89	0.15	1.00	4.00	2.00	4.00	34	2
6	DifficultHiring	5.00	6.93	6.10	1.05	0.00	19.00	2.00	12.00	34	5
7	App	0.00	0.44	0.51	0.09	0.00	1.00	0.00	1.00	34	7
8	Age	1974.00	1976.52	12.32	2.11	1959.00	2001.00	1967.50	1985.50	34	7
9	Nationality	1.00	1.78	4.04	0.69	1.00	22.00	1.00	1.00	34	7
10	MemberExpertSuisse	1.00	0.59	0.50	0.09	0.00	1.00	0.00	1.00	34	7
11	EducationSecondary	0.00	1.00	1.13	0.19	0.00	3.00	0.00	2.00	34	0
12	EducationTertiary	1.00	1.32	1.55	0.27	0.00	6.00	0.00	2.00	34	0

Table A.3: Covariate Data Fiduciary Network Geneva

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	FrequencyHiring	2.00	3.45	3.87	0.40	0.00	20.00	1.00	5.00	92	7
2	NumberEmployeesTot	6.00	7.53	6.70	0.70	1.00	38.00	3.00	10.00	92	13
3	CurrentRole	3.00	2.93	0.88	0.09	1.00	4.00	2.75	4.00	92	8
4	NumServicesProvided	10.00	8.77	3.70	0.39	0.00	14.00	8.00	11.00	92	0
5	InfluenceHiring	3.00	3.09	0.71	0.07	1.00	4.00	3.00	4.00	92	6
6	DifficultHiring	5.00	6.79	5.37	0.56	0.00	18.00	2.00	11.00	92	10
7	App	0.50	0.50	0.50	0.05	0.00	1.00	0.00	1.00	92	10
8	Age	1972.00	1973.48	14.48	1.51	1941.00	2003.00	1963.00	1982.75	92	10
9	Nationality	1.00	2.94	5.19	0.54	1.00	22.00	1.00	1.00	92	11
10	MemberExpertSuisse	1.00	0.55	0.50	0.05	0.00	1.00	0.00	1.00	92	10
11	EducationSecondary	0.00	0.73	1.04	0.11	0.00	3.00	0.00	2.00	92	0
12	EducationTertiary	1.00	1.27	1.71	0.18	0.00	6.00	0.00	2.00	92	0

Table A.4: Covariate Data Fiduciary Network Neuchâtel Jura

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	Years Worked	4.00	7.57	9.16	2.00	0.50	42.00	3.00	10.00	21	0
2	NumberHires	2.00	3.33	3.73	0.81	0.00	15.00	1.00	4.00	21	0
3	NumberEmployees	11.00	15.38	14.64	3.19	2.00	63.00	5.00	18.00	21	0
4	Role	3.00	2.71	0.46	0.10	2.00	3.00	2.00	3.00	21	0
5	StructuresType	2.00	2.76	0.89	0.19	2.00	4.00	2.00	4.00	21	0
6	InfluenceHiring	2.00	2.55	0.83	0.18	2.00	4.00	2.00	3.00	21	1
7	NumberHiringsDone	5.00	10.00	12.67	2.77	0.00	50.00	2.75	13.50	21	1
8	HiringDifficult	3.00	2.60	1.31	0.29	0.00	4.00	2.00	3.25	21	1
9	Trainingfirm	2.00	1.75	0.55	0.12	1.00	3.00	1.00	2.00	21	1
10	Gender	1.00	1.11	0.32	0.07	1.00	2.00	1.00	1.00	21	3
11	Year birth	1976.00	1977.44	8.26	1.80	1961.00	1994.00	1972.00	1982.75	21	3
12	Nationality	1.00	1.50	1.25	0.27	1.00	6.00	1.00	1.00	21	3
13	Capacité.totale	29.00	36.95	27.92	6.09	10.00	130.00	20.00	48.00	21	0
14	Fonction.directeur.structure	1.00	1.48	0.51	0.11	1.00	2.00	1.00	2.00	21	0
15	Localité	82.00	79.33	50.31	10.98	3.00	140.00	47.00	125.00	21	0
16	Réseau.HR	1.00	1.43	0.51	0.11	1.00	2.00	1.00	2.00	21	0
17	Type	1.00	1.62	0.74	0.16	1.00	3.00	1.00	2.00	21	0

Table A.5: Covariate Data Fiduciary Networks Membership in Expert Suisse

	Member	Not Member	NA	Total
Basel Membership in ExpertSuisse N	33.00	42.00	21.00	96.00
Basel Membership in ExpertSuisse Share	0.34	0.44	0.22	1.00
Fribourg Membership in ExpertSuisse N	16.00	11.00	7.00	34.00
Fribourg Membership in ExpertSuisse Share	0.47	0.32	0.21	1.00
Geneva Membership in ExpertSuisse N	45.00	37.00	10.00	92.00
Geneva Membership in ExpertSuisse Share	0.49	0.40	0.11	1.00
Neuchâtel - Jura Membership in ExpertSuisse N	22.00	10.00	2.00	34.00
Neuchâtel - Jura Membership in ExpertSuisse Share	0.65	0.29	0.06	1.00

Table A.6: Covariate Data Fiduciary Networks Training Firm

	Doesn't train	Training firm	NA	Total
Basel Trainingfirms N	55.00	20.00	21.00	96.00
Basel Trainingfirms Share	0.57	0.21	0.22	1.00
Fribourg Trainingfirms N	15.00	12.00	7.00	34.00
Fribourg Trainingfirms Share	0.44	0.35	0.21	1.00
Geneva Trainingfirms N	41.00	41.00	10.00	92.00
Geneva Trainingfirms Share	0.45	0.45	0.11	1.00
Neuchâtel Jura Trainingfirms N	20.00	12.00	2.00	34.00
Neuchâtel Jura Trainingfirms Share	0.59	0.35	0.06	1.00

Table A.7: Covariate Data Fiduciary Networks Role Respondent

	Geschäftsführer.in	Mandatsleiter.in	Sachbearbeiter.in	Partner.in	NA.	Total
Basel Role N	42.00	9.00	15.00	28.00	2.00	96.00
Basel Role Share	0.44	0.09	0.16	0.29	0.02	1.00
Fribourg Role N	16.00	7.00	2.00	7.00	2.00	34.00
Fribourg Role Share	0.47	0.21	0.06	0.21	0.06	1.00
Geneva Role N	42.00	15.00	7.00	24.00	4.00	92.00
Geneva Role Share	0.46	0.16	0.08	0.26	0.04	1.00
Neuchâtel Jura Role N	16.00	6.00	4.00	8.00	0.00	34.00
Neuchâtel Jura Role Share	0.47	0.18	0.12	0.24	0.00	1.00

Table A.8: Covariate Data Fiduciary Networks Secondary Education

	Basel N	Basel share	Fribourg N	Fribourg share	Geneva N	Geneva share	Neuchâtel-Jura N	Neuchâtel-Jura share
Gymnasium	7.00	0.07	2.00	0.06	2.00	0.02	1.00	0.03
Handelsschule	9.00	0.09	1.00	0.03	8.00	0.09	3.00	0.09
KV EFZ and. Aus.	21.00	0.22	2.00	0.06	2.00	0.02	1.00	0.03
KV EFZ and. Aus. mit BM	0.00	0.00	2.00	0.06	0.00	0.00	4.00	0.12
KV EFZ DL&A	6.00	0.06	2.00	0.06	6.00	0.07	3.00	0.09
KV EFZ DL&A mit BM	16.00	0.17	9.00	0.26	12.00	0.13	7.00	0.21
KV EFZ Treuhand	0.00	0.00	1.00	0.03	0.00	0.00	0.00	0.00
NA	30.00	0.31	9.00	0.26	26.00	0.28	5.00	0.15
Total	96.00	1.00	34.00	1.00	92.00	1.00	34.00	1.00

Table A.9: Covariate Data Fiduciary Networks Tertiary Education

	Basel N	Basel share	Fribourg N	Fribourg share	Geneva N	Geneva share	Neuchâtel-Jura N	Neuchâtel-Jura share
BA Business UAS	4.00	0.04	4.00	0.12	3.00	0.03	3.00	0.09
BA Business Univ.	1.00	0.01	2.00	0.06	1.00	0.01	1.00	0.03
Berufsprüf. Treuhänder/in	30.00	0.31	11.00	0.32	13.00	0.14	10.00	0.29
Exp. Rechnungsl./Control.	9.00	0.09	3.00	0.09	3.00	0.03	3.00	0.09
Steuerexpert/in	1.00	0.01	0.00	0.00	3.00	0.03	1.00	0.03
Treuhandexpert/in	19.00	0.20	6.00	0.18	10.00	0.11	2.00	0.06
Wirtschaftsprüfer/in	8.00	0.08	1.00	0.03	16.00	0.17	2.00	0.06
MA Business Univ.	3.00	0.03	1.00	0.03	7.00	0.08	1.00	0.03
MA Business UAS	3.00	0.03	1.00	0.03	2.00	0.02	0.00	0.00
NA	30.00	0.31	9.00	0.26	26.00	0.28	5.00	0.15
Total	96.00	1.00	34.00	1.00	92.00	1.00	34.00	1.00

Table A.10: Covariate Data Fiduciary Networks Services Provided

	Basel N	Basel share	Fribourg N	Fribourg share	Geneva N	Geneva share	Neuchâtel-Jura N	Neuchâtel-Jura share
Finanzbuchaltung	75.00	0.78	26.00	0.76	79.00	0.86	31.00	0.91
Domizilhaltung	48.00	0.50	22.00	0.65	75.00	0.82	24.00	0.71
Erbschaftsberatung	43.00	0.45	19.00	0.56	41.00	0.45	23.00	0.68
Gesellschaftsgründung	61.00	0.64	26.00	0.76	79.00	0.86	28.00	0.82
Liegenschaftsverwaltung	26.00	0.27	11.00	0.32	15.00	0.16	14.00	0.41
Lohnbuchhaltung	71.00	0.74	25.00	0.74	77.00	0.84	29.00	0.85
Organisationsberatung	33.00	0.34	16.00	0.47	51.00	0.55	16.00	0.47
Personaladministration	64.00	0.67	22.00	0.65	71.00	0.77	25.00	0.74
Rechtsberatung	25.00	0.26	6.00	0.18	43.00	0.47	11.00	0.32
Steuerberatung	74.00	0.77	26.00	0.76	77.00	0.84	32.00	0.94
Unternehmensberatung	64.00	0.67	26.00	0.76	76.00	0.83	32.00	0.94
Vermögensverwaltung	14.00	0.15	1.00	0.03	11.00	0.12	3.00	0.09
Wirtschaftsprüfung	47.00	0.49	19.00	0.56	42.00	0.46	24.00	0.71
Betriebl. Rechnungswesen	41.00	0.43	17.00	0.50	70.00	0.76	26.00	0.76
NA	21.00	0.22	7.00	0.21	10.00	0.11	2.00	0.06
Total	96.00	1.00	34.00	1.00	92.00	1.00	34.00	1.00

Table A.11: Covariate Data Fiduciary Networks Nationality

	Basel N	Basel share	Fribourg N	Fribourg share	Geneva N	Geneva share	Neuchâtel-Jura N	Neuchâtel-Jura share
Switzerland	69.00	0.69	27.00	0.79	69.00	0.75	31.00	0.91
Italy	6.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
France	3.00	0.03	0.00	0.00	12.00	0.13	0.00	0.00
Germany	1.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Spain	0.00	0.00	0.00	0.00	2.00	0.02	0.00	0.00
Portugal	1.00	0.01	1.00	0.03	2.00	0.02	0.00	0.00
Other	0.00	0.00	0.00	0.00	6.00	0.07	0.00	0.00
NA	25.00	0.25	7.00	0.21	10.00	0.11	3.00	0.09
Total	100.00	1.00	34.00	1.00	92.00	1.00	34.00	1.00

Table A.12: Covariate Data Fiduciary Networks Gender

	Female	Male	Prefer not to answer	NA	Total
Basel Gender N	23.00	51.00	1.00	25.00	100.00
Basel Gender Share	0.23	0.51	0.01	0.25	1.00
Fribourg Gender N	10.00	17.00	0.00	7.00	34.00
Fribourg Gender Share	0.29	0.50	0.00	0.21	1.00
Geneva Gender N	27.00	54.00	1.00	10.00	92.00
Geneva Gender Share	0.29	0.59	0.01	0.11	1.00
Neuchâtel-Jura Gender N	6.00	24.00	1.00	3.00	34.00
Neuchâtel-Jura Gender Share	0.18	0.71	0.03	0.09	1.00

9.4 Descriptive Statistics Covariate Data Childcare

Table A.13: Covariate Data Childcare Network AJEMA

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	Years Worked	6.00	7.69	7.21	1.20	0.25	30.00	2.00	10.00	36	1
2	NumberHires	2.00	3.10	3.49	0.58	0.00	15.00	1.00	3.00	36	1
3	NumberEmployees	13.00	18.46	21.08	3.51	1.00	106.00	6.00	20.00	36	1
4	Role	3.00	2.89	0.32	0.05	2.00	3.00	3.00	3.00	36	1
5	StructuresType	2.00	2.74	0.89	0.15	2.00	4.00	2.00	4.00	36	1
6	InfluenceHiring	2.00	2.89	0.99	0.17	2.00	4.00	2.00	4.00	36	1
7	NumberHiringsDone	8.00	11.09	11.65	1.94	1.00	60.00	4.50	15.00	36	1
8	HiringDifficult	3.00	2.69	1.32	0.22	0.00	5.00	2.00	4.00	36	1
9	Trainingfirm	2.00	1.82	0.53	0.09	1.00	3.00	2.00	2.00	36	3
10	Gender	1.00	1.06	0.24	0.04	1.00	2.00	1.00	1.00	36	3
11	Year birth	1975.00	1975.85	8.80	1.47	1953.00	1991.00	1971.00	1983.00	36	3
12	Nationality	1.00	1.30	0.68	0.11	1.00	3.00	1.00	1.00	36	3
13	Capacité.totale	44.00	41.53	22.63	3.77	7.00	95.00	24.00	51.00	36	0
14	Fonction.directeur.structure	1.00	1.14	0.35	0.06	1.00	2.00	1.00	1.00	36	0
15	Localité	73.50	69.67	38.55	6.43	2.00	134.00	50.00	93.00	36	0
16	Réseau.HR	1.00	1.33	0.48	0.08	1.00	2.00	1.00	2.00	36	0
17	Type	2.00	1.78	0.72	0.12	1.00	3.00	1.00	2.00	36	0

Table A.14: Covariate Data Childcare Network EFAJE

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	Years Worked	4.50	5.67	4.21	0.77	0.50	17.00	2.25	8.00	30	0
2	NumberHires	2.00	1.87	1.31	0.24	0.00	5.00	1.00	3.00	30	0
3	NumberEmployees	7.50	10.00	7.75	1.42	1.00	28.00	5.00	14.00	30	0
4	Role	3.00	2.87	0.35	0.06	2.00	3.00	3.00	3.00	30	0
5	StructuresType	3.00	2.77	0.82	0.15	2.00	4.00	2.00	3.00	30	0
6	InfluenceHiring	4.00	3.13	0.97	0.18	2.00	4.00	2.00	4.00	30	0
7	NumberHiringsDone	5.00	6.67	5.63	1.03	0.00	22.00	2.25	10.00	30	0
8	HiringDifficult	3.00	2.37	1.47	0.27	0.00	5.00	2.00	3.00	30	0
9	Trainingfirm	2.00	1.62	0.49	0.09	1.00	2.00	1.00	2.00	30	1
10	Gender	1.00	1.11	0.31	0.06	1.00	2.00	1.00	1.00	30	2
11	Year birth	1975.50	1975.36	8.07	1.47	1956.00	1991.00	1970.75	1979.75	30	2
12	Nationality	1.00	1.64	1.91	0.35	1.00	10.00	1.00	1.00	30	2
13	Capacité.totale	36.00	41.83	27.38	5.00	10.00	120.00	17.75	60.00	30	0
14	Fonction.directeur.structure	1.00	1.07	0.25	0.05	1.00	2.00	1.00	1.00	30	0
15	Localité	80.00	72.87	37.44	6.83	11.00	144.00	49.00	94.25	30	0
16	Réseau.HR	1.00	1.23	0.43	0.08	1.00	2.00	1.00	1.00	30	0
17	Type	1.50	1.57	0.63	0.11	1.00	3.00	1.00	2.00	30	0

Table A.15: Covariate Data Childcare Network Enfants Chablais

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	Years Worked	10.00	8.62	6.37	1.46	0.00	21.00	2.50	13.00	19	0
2	NumberHires	2.00	2.37	2.34	0.54	0.00	10.00	1.50	2.00	19	0
3	NumberEmployees	11.00	14.16	14.42	3.31	2.00	63.00	5.00	13.50	19	0
4	Role	3.00	2.89	0.32	0.07	2.00	3.00	3.00	3.00	19	0
5	StructuresType	2.00	2.58	0.84	0.19	2.00	4.00	2.00	3.00	19	0
6	InfluenceHiring	4.00	3.11	0.99	0.23	2.00	4.00	2.00	4.00	19	0
7	NumberHiringsDone	5.00	8.00	10.59	2.43	1.00	50.00	4.00	8.50	19	0
8	HiringDifficult	3.00	2.89	0.81	0.19	1.00	4.00	2.50	3.00	19	0
9	Trainingfirm	2.00	1.79	0.42	0.10	1.00	2.00	2.00	2.00	19	0
10	Gender	1.00	1.16	0.37	0.09	1.00	2.00	1.00	1.00	19	0
11	Year birth	1976.00	1974.63	10.03	2.30	1958.00	1992.00	1966.00	1982.00	19	0
12	Nationality	1.00	1.68	2.11	0.48	1.00	9.00	1.00	1.00	19	0
13	Capacité.totale	36.00	36.84	22.65	5.20	7.00	83.00	20.50	48.00	19	0
14	Fonction.directeur.structure	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	19	0
15	Localité	96.00	90.16	49.63	11.39	1.00	145.00	73.00	137.00	19	0
16	Réseau.HR	1.00	1.16	0.37	0.09	1.00	2.00	1.00	1.00	19	0
17	Type	2.00	1.74	0.65	0.15	1.00	3.00	1.00	2.00	19	0

Table A.16: Covariate Data Childcare Network RAT

	variable	Median	Mean	SD	SE	Min	Max	q25	q75	n	Missing
1	Years Worked	4.00	7.57	9.16	2.00	0.50	42.00	3.00	10.00	21	0
2	NumberHires	2.00	3.33	3.73	0.81	0.00	15.00	1.00	4.00	21	0
3	NumberEmployees	11.00	15.38	14.64	3.19	2.00	63.00	5.00	18.00	21	0
4	Role	3.00	2.71	0.46	0.10	2.00	3.00	2.00	3.00	21	0
5	StructuresType	2.00	2.76	0.89	0.19	2.00	4.00	2.00	4.00	21	0
6	InfluenceHiring	2.00	2.55	0.83	0.18	2.00	4.00	2.00	3.00	21	1
7	NumberHiringsDone	5.00	10.00	12.67	2.77	0.00	50.00	2.75	13.50	21	1
8	HiringDifficult	3.00	2.60	1.31	0.29	0.00	4.00	2.00	3.25	21	1
9	Trainingfirm	2.00	1.75	0.55	0.12	1.00	3.00	1.00	2.00	21	1
10	Gender	1.00	1.11	0.32	0.07	1.00	2.00	1.00	1.00	21	3
11	Year birth	1976.00	1977.44	8.26	1.80	1961.00	1994.00	1972.00	1982.75	21	3
12	Nationality	1.00	1.50	1.25	0.27	1.00	6.00	1.00	1.00	21	3
13	Capacité.totale	29.00	36.95	27.92	6.09	10.00	130.00	20.00	48.00	21	0
14	Fonction.directeur.structure	1.00	1.48	0.51	0.11	1.00	2.00	1.00	2.00	21	0
15	Localité	82.00	79.33	50.31	10.98	3.00	140.00	47.00	125.00	21	0
16	Réseau.HR	1.00	1.43	0.51	0.11	1.00	2.00	1.00	2.00	21	0
17	Type	1.00	1.62	0.74	0.16	1.00	3.00	1.00	2.00	21	0

Table A.17: Covariate Data Childcare Networks Role

	Director	Other	NA	Total
AJEMA Role N	31.00	4.00	1.00	36.00
AJEMA Role Share	0.86	0.11	0.03	1.00
EFAJE Role N	26.00	4.00	0.00	30.00
EFAJE Role Share	0.87	0.13	0.00	1.00
Enfants Chablais Role N	17.00	2.00	0.00	19.00
Enfants Chablais Role Share	0.89	0.11	0.00	1.00
RAT Role N	15.00	6.00	0.00	21.00
RAT Role Share	0.71	0.29	0.00	1.00

Table A.18: Covariate Data Childcare Networks Gender

	Female	Male	NA.	Other/prefer not to say	Total
AJEMA N	31.00	2.00	3.00	0.00	36.00
AJEMA Share	0.86	0.06	0.08	0.00	1.00
EFAJE N	25.00	3.00	2.00	0.00	30.00
EFAJE Share	0.83	0.10	0.07	0.00	1.00
Enfants Chablais N	16.00	3.00	0.00	0.00	19.00
Enfants Chablais Share	0.84	0.16	0.00	0.00	1.00
RAT N	16.00	2.00	3.00	0.00	21.00
RAT Share	0.76	0.10	0.14	0.00	1.00

Table A.19: Covariate Data Childcare Networks Nationality

	Switzerland	Italy	France	Germany	Spain	Portugal	Turkey	Other	Libellé.réseau	NA.	Total
AJEMA nationality N	31.00	1.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.00
AJEMA nationality share	0.86	0.03	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
EFAJE nationality N	25.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	30.00
EFAJE nationality share	0.83	0.03	0.03	0.00	0.00	0.03	0.00	0.03	0.00	0.00	1.00
Enfants Chablais nationality N	17.00	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	19.00
Enfants Chablais nationality share	0.89	0.00	0.00	0.00	0.05	0.00	0.00	0.05	0.00	0.00	1.00
RAT nationality N	15.00	0.00	3.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	21.00
RAT nationality share	0.71	0.00	0.14	0.00	0.00	0.00	0.00	0.05	0.00	0.00	1.00

Table A.20: Covariate Data Childcare Networks Firms' Involvement in Training

	Currently training	Involved in training in the past	Never	NA	Total
AJEMA N	23.00	2.00	8.00	0.00	36.00
AJEMA Share	0.64	0.06	0.22	0.00	1.00
EFAJE N	18.00	0.00	11.00	0.00	30.00
EFAJE Share	0.60	0.00	0.37	0.00	1.00
Enfants Chablais N	15.00	0.00	4.00	0.00	19.00
Enfants Chablais Share	0.79	0.00	0.21	0.00	1.00
RAT N	13.00	1.00	6.00	0.00	21.00
RAT Share	0.62	0.05	0.29	0.00	1.00

Table A.21: Covariate Data Childcare Networks Membership in Réseau

	Member	Not.member	NA.	Total
AJEMA N	24.00	12.00	0.00	36.00
AJEMA Share	0.67	0.33	0.00	1.00
EFAJE N	23.00	7.00	0.00	30.00
EFAJE Share	0.77	0.23	0.00	1.00
Enfants Chablais N	16.00	3.00	0.00	19.00
Enfants Chablais Share	0.84	0.16	0.00	1.00
RAT N	12.00	9.00	0.00	21.00
RAT Share	0.57	0.43	0.00	1.00

Table A.22: Covariate Data Childcare Networks Type of Structure

	Private not subsidized not affiliated	Private subsidized affiliated	Public affiliated	NA	Total
AJEMA N	10.00	6.00	19.00	1.00	36.00
AJEMA Share	0.28	0.17	0.53	0.03	1.00
EFAJE N	7.00	9.00	14.00	0.00	30.00
EFAJE Share	0.23	0.30	0.47	0.00	1.00
Enfants Chablais N	4.00	3.00	12.00	0.00	19.00
Enfants Chablais Share	0.21	0.16	0.63	0.00	1.00
RAT N	6.00	4.00	11.00	0.00	21.00
RAT Share	0.29	0.19	0.52	0.00	1.00

9.5 List of interviewees in the fiduciary sector

Table A.23: Interviewees in the fiduciary sector

Date	Company	Interviewee	Interviewer
7.11.2020	Employer association for small commerce	Representative	Author, online
14.12.2020	Small fiduciary business	Vice director	Author, online
16.12.2020	Employer association for fiduciaries	Representative	Author, online
1.2.2021	Small fiduciary business	Director	Author, online
19.3.2021	Small fiduciary business	Employee	Author, online
13.4.2021	Small fiduciary business	Director	Author, online
14.4.2021	Large fiduciary business	Vice director	Author, online

9.6 Codebook interviews fiduciary sector

1. Areas of responsibility / role of the interviewee
2. Importance of grades in recruitment
3. Work experience
    - How is professional experience from other sectors assessed?
    - Does the size of the companies in which the candidates have worked play a role?
4. Vocational baccalaureate
5. Company organization
    - How many employees? What type of customers?
6. Evaluation of upper-secondary level qualifications
    - School-based versus company-based basic education
7. Evaluation of alternative diplomas (recognition of prior learning, recognition of foreign diploma)
8. Evaluation of tertiary qualifications
9. Digitalization

10. Commitment to training
11. Shortage of skilled workers
12. International recruitment
13. Motivation for investing in training
14. Prestige / quality of employers
15. References
16. Other recruitment criteria
17. Recruitment process
18. Networking in the region
19. Admission requirements for various courses / labor market
    - If they are talking about admission conditions to the labor market, i.e. about protected markets; or about criteria of examination that look different because of Corona
20. Personal background of the interviewee
21. Description of fiduciary activity
    - Description of the activity in commercial training in general; when they talk about salary expectations in the sector
22. Associations Treuhand/Expert Suisse
    - Tasks of the association; Membership criteria; Conflict between Treuhand and Expert Suisse
23. Organization / reform of the KV training course
    - Even if other organizations are described in the area of KV training

9.7 List of interviewees in the childcare sector

Table A.24: Interviewees in the childcare sector

Date	Company	Interviewee	Interviewer
08.12.2020	Childcare center	Director	Author
08.12.2020	Cantonal institution overseeing childcare	Head	Author
08.12.2020	Employer association for childcare	Secretary General	Author
08.12.2020	Cantonal department of post-compulsory education	Deputy	Author
11.05.2021	Childcare center	Director	Research assistant
17.05.2021	Childcare center	Director	Research assistant
19.05.2021	Childcare center	Director	Research assistant
20.05.2021	Childcare center	Director	Research assistant
25.05.2021	Childcare center	Director	Research assistant
26.05.2021	Childcare center	Director	Research assistant
27.05.2021	Childcare center	Director	Author, Research assistant
28.05.2021	Childcare center	Director	Research assistant
01.06.2021	Childcare center	Director	Research assistant
08.06.2021	Childcare center	Director	Author, Research assistant
09.06.2021	Childcare center	Director	Research assistant
10.06.2021	Childcare center	Director	Research assistant
11.06.2021	Childcare center	Director	Research assistant
16.06.2021	Childcare center	Director	Research assistant

9.8 Codebook interviews childcare sector

1. Code: Personal trajectory of the person interviewed
    - Subcode: Education
    - Subcode: Position
    - Subcode: Experience
2. Code: Information about the childcare structure
    - Subcode: Opening hours
    - Subcode: Number of employees
    - Subcode: Number / Age of kids
    - Subcode: Location of the structure
    - Subcode: History of the structure
    - Subcode: Pedagogical concept
    - Subcode: Private or public
3. Code: Composition of the workforce
    - Subcode: Nationality
    - Subcode: Education level
4. Code: Composition of children / parents
    - Subcode: Nationality
    - Subcode: SES of parents
    - Subcode: Working time of parents
    - Subcode: Non-traditional families
5. Code: General observations around diploma: When interviewees describe if employers know about these different diplomas; or if they mention that they employ these diploma in their structure

- Subcode: Observations around FQR
- Subcode: Observations around RPL: Also: When they describe discrimination in relation to nationality and being granted recognition
- Subcode: Observations around traditional CFC
- Subcode: Observations around baccalaureate
- Subcode: Observations around tertiary education

6. Code: Valorisation of credentials (credentialism)
    - Subcode: RPL tracks introduce heterogeneity in the candidate pool
    - Subcode: RPL tracks introduce heterogeneity in the candidate pool Subcode: CFC tracks are not demanding enough: RPL tracks introduce heterogeneity in the candidate pool
7. Code: Valorisation of credentials in a signalling perspective
    - Subcode: RPL tracks are not demanding enough: "This track should not let pass everybody".
    - Subcode: FQR track is not demanding enough: "This track should not let pass everybody".
    - Subcode: CFC tracks are not demanding enough: "This track should not let pass everybody".
8. Code: Valorisation of credentials in a human capital perspective
    - Subcode: Experience / skills in FQR track in relation to job: If they mention that the knowledge on institutional particularities are not sufficient for what is needed on the job. If they mention that the practical experience of FQR candidates is sufficient for the job.
    - Subcode: Experience / skills of RPL candidates in relation to job: If they mention that the reflective skills are not sufficient for what is needed on the job. If they mention that the practical experience of RPL candidates is sufficient for the job.

- Subcode: Experience / skills of those who take the baccalaureate in relation to job: Also if they make no difference between candidates with baccalaureate and without a baccalaureate
- Subcode: Skills / experience of candidates with a tertiary degree in comparison to job: I.e. If tertiary degree candidates' theoretical knowledge is beyond what can be used on the job

9. Code: Investment in education
    - Subcode: Do they encourage candidates to pursue baccalaureate
    - Subcode: Investment in further education
    - Subcode: Renewing the processes in the organization by adapting the knowledge of apprentices.
10. Code: Organization of work / hierarchization of tasks
    - Subcode: Career possibilities in this sector
    - Subcode: Level of hierarchy / are tasks divided according to education level
    - Subcode: Cost structure: which age group is most costly
    - Subcode: Regulations regarding the workforce composition in daycare centers
11. Code: Employer connections in the childcare sector
    - Subcode: Reputation
    - Subcode: Referral networks
    - Subcode: Other forms of cooperation
12. Code: Labor market in the childcare sector
    - Subcode: Lack of skilled labour
    - Subcode: Turnover of personnel
    - Subcode: Difference between working in a private and a public structure

- Subcode: General characteristics of the workforce in childcare centres

13. Code: Product market in the childcare sector

    - Subcode: Lack of places
    - Code: Personnel selection process