

Does it pay to help and to be helped?

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ACE conference, 12 July 2018

Outline

- Related literature
- An agency model of informal help
- Data and econometric analysis
- Results
- Conclusion

- What are the determinants of informal help at the workplace ?
 - Social logic of interactions
 - Managerial logic of the organisational design of the information system
- Impacts of informal help (at wokplace) for individuals
 - On effort
 - On wage
- Contribute to understand the social dimension of performance:
How do social networks interact with the relational organisational design at the workplace ?

Related literature

- **Organisational design literature:**
Extensive lit. in management and economics on the relational architecture of work:
 - Hierarchy and centralisation of information around managers (ex: Garicano, 2000)
 - Decentralisation of the IS (ex: Aoki, 1990)
- **Social network and social capital literature:**
 - focuses mainly on individual outcomes such as wage, growth, productivity, promotion, innovation (cf. McEvily, 2014)
 - Social capital : social networks and communication improve the capacity to solve operational problems (Gant et al, 2002)
- Combine both literature since workers are both in situation of productive interdependencies and social interactions at the workplace
- **Agency models of help : helping effort on the job**
 - Itoh (1991): the principal can use help to improve the productive performance of his employees.
 - Drago and Garvey (1998): tests how commonly used incentive schemes affect worker's choices to help.

Motivation

- Many studies argue that communication among employees in general and help in particular are profitable for the firms → firms should fully formalise help among employee
But it may not be feasible (incomplete contract)
- Why do workers help one another?
 - Help is costly for the one who helps (at least in terms of time / effort) if there is no official recognition of this informal help
 - Solidarity between employees (social logic) = informal mechanisms
 - Workers behave in line with the incentives given by the organizational design set up by firms = formal mechanisms

Agency model

Any task has two dimensions :

- The **Describable dimension** which is known by the Principal and the Agents = written in the contract
- The **Undescribable dimension (Al Najaar et al, 2006)** is known only by the Agents when they are starting working = can not be written in the contract

Help at the workplace combines:

- **Formal help** : formalised/designed by the Principal. When an event arises, the Principal can state who communicates with whom (D-dimension of the task)
- **Informal communication (= help)** : is not formalised by the Principal (concerns the UD-dimension of the task)

Agency model

- The Principal risk-neutral, Agents risk-averse with a utility function U :

$$U(\mathbf{w}, \mathbf{k}, \mathbf{h}_o, \mathbf{h}_r) = u(\mathbf{w}) - v(\mathbf{k}) + \Lambda_r(\mathbf{h}_r) - \Lambda_o(\mathbf{h}_o)$$

$h_r =$ the help received and $h_o =$ the help to other employees and k is the effort; $k \in \Theta_g = \{0, 1, \dots, e, \dots, e_g\}$

- For workers who are members of an informal help network: $E[\hat{U}(w, k)] \leq E[U(w, k, h_o, h_r)]$
- $Pr(X=1 | K=k, hr, ho)$: conditional probability of success of the task given the level of effort is k
an increasing function of k ; hr and a non-decreasing function of ho .

- Expected profit:

$$[R^{\uparrow sup} - w^{\downarrow 1}] \cdot Pr(X=1 | K=k, hr, ho) + [R^{\uparrow inf} - w^{\downarrow 0}] \cdot [1 - Pr(X=1 | K=k, hr, ho)]$$

Agency model

- The Principal maximizes the expected profit (for an effort $k=e$), under a participation constraint and under an incentive constraint

Using the Kuhn-Tucker method, the optimal wage is:

$$\begin{aligned} \frac{\partial w \downarrow 1}{\partial w} &= u' \uparrow - 1 \left[\frac{Pr(X=1|k=e,hr,ho)}{\lambda Pr(X=1|k=e,hr,ho)} \right. \\ &+ \left. \mu Pr' (X=1|k=e,hr,ho) \right] @w \downarrow 0 = u' \uparrow - 1 \left[\frac{Pr(X=0|k=e,hr,ho)}{\lambda Pr(X=0|k=e,hr,ho)} \right. \\ &+ \left. \mu Pr' (X=0|k=e,hr,ho) \right] \quad (3) \end{aligned}$$

With the wage-utility function : $u(w) = \ln(w)$.

$$\begin{aligned} \frac{\partial w \downarrow 1}{\partial w} &= \lambda Pr(X=1|k=e,hr,ho) + \mu Pr' (X=1|k=e,hr,ho) \\ &@w \downarrow 0 = \lambda Pr(X=0|k=e,hr,ho) + \mu Pr' (X=0|k=e,hr,ho) \quad (4) \end{aligned}$$

$w \downarrow 0$ and $w \downarrow 1$ directly depend on hr and ho .

The wage is an increasing function of help received under certain conditions

Likelihood ratio
Sensitivity of the probability
of success to hr (elasticity)

Agency model : wage and help

- $\frac{\partial w \downarrow 1}{\partial hr} > 0$ if and only if $\frac{\partial Pr'(X=1|k=e,hr,ho)}{\partial hr} / Pr'(X=1|k=e,hr,ho) > \frac{\partial Pr(X=1|k=e,hr,ho)}{\partial hr} / Pr(X=1|k=e,hr,ho)$ (5)

$$\frac{\partial w \downarrow 1}{\partial hr} > 0 \text{ if and only if } \varepsilon \downarrow Pr' \uparrow / hr > \varepsilon \downarrow Pr / hr$$

(6)

- $\frac{\partial w \downarrow 1}{\partial ho} > 0$ if and only if $\varepsilon \downarrow Pr' \uparrow / ho > \varepsilon \downarrow Pr / ho$
- (7)

- The sign of the relationship between informal help and wages depends on (6) and (7). It has to be tested empirically to reach a conclusion.

Help and effort

- Does informal help decrease or increase the level of workers' effort?
- Will employees involved in informal help network free-ride their “informal team” and provide a lower level of effort or, will they exhibit a stronger intrinsic motivation translated into higher level of effort?
- According to our model, while there is no direct impact of informal help network membership on effort, the impact is indirect and comes from a selection effect.

Proposition to be tested

informal help network may attract workers with a low-disutility of effort with respect to v or $\Delta \downarrow o$

Determinants of informal help

- Characteristics of workers may influence informal help by reproducing the social logic and stereotypes
- Role of organisational design
- Environment with instability and uncertainty favour the UD dimension of task

Outcomes of informal help

- Effort: 2 opposite effects
SS: for self-selection effect
FR: for free-riding behaviour
- Wages depends if 6 and 7 hold.
Need to be tested

Reference Hr=0 & Ho=0	Hr>0 & Ho>0	Hr=0 & Ho>0	Hr>0 & Ho=0
Effort	SS: + FR: - = ns	SS: + FR: ns = ++	SS : ns FR: - = - -

Data

- A matched employer/employee survey on « computerisation and organisational change », COI, 2006 = indicators of help, organisational design, effort, and socio-demographic characteristics
- DADS (administrative dataset) to measure wages
- Sample of 12,927 employees (with at least one year of seniority) from the private sector who belong to 5,962 firms (of at least 50 employees)

Measures

$$TH_i = \alpha_0 + \alpha_1 FC_i + \varepsilon_i \Rightarrow \varepsilon_i = IH_i \text{ if } \varepsilon_i \geq 0 \text{ then } IH_i = 1 \text{ else } IH_i = 0$$

Informal help is measure indirectly

- TH is the total help that a worker receives and gives at the workplaces (measured with 11 questions)
- FC: Formal help is the flow of help and information associated with the division of labour and distribution of authority within the firm (measured with 7 questions)
- Informal help is the part of total help not correlated with the FC: predicted positive residuals of the regression of total help TH over formal help

Dependent variables:

- Wage : logarithm of net wage
- Productive effort

Example of questions

$$\begin{aligned} TH_i &= \alpha_0 + \alpha_1 FC_i + \varepsilon_i @ \\ IH_i &= \begin{cases} 1 & \text{if } \varepsilon_i \geq 0 \\ 0 & \text{else} \end{cases} @ \end{aligned}$$

TOTAL HELP (11 questions)

- *Question 1: Do you ever help colleagues in the event of a technical problem?*
- *Question 2: Do other workers ask you help in case of difficulties within their team, clients, costumers or other people?*

FORMAL HELP (7 questions)

- *Do you regularly work with your supervisors? Yes/No*
- *Do you regularly work with persons you supervise? Yes/No*
- *Do you regularly work with colleagues from the same department? Yes/No*

Distribution of help

Variable	Total sample	IH=1	IHo=1	IHr=1	IHnonr=1
Number obs	12,475	2,850	2,743	2,723	4,159
%	(100.00 %)	(22.85%)	(21.99%)	(21.83%)	(33.34%)

IH=1 individuals who simultaneously receive and give help

IHo=1 individuals who only offer help,

IHr=1 individuals who only receive help

IHnonr=1 individuals who do not participate to a informal help network

Econometric model

Switching models control the endogeneity (of wage and effort) and selection bias estimates 2 equations

1. the switching equation (tells us if workers belong to an informal help network)

$$HELP_i = \begin{cases} 1 & \text{if } HELP_i^* = Z_i \gamma + u_i > 0 \\ 0 & \text{otherwise} \end{cases}$$

Where $HELP_i$ is the vector of variables of informal help and Z_i are exogenous variable (determinants of help)

2. Two regimes are possible :
 - @Regime 1 : $Y_{1i} = X_{1i} \beta_1 + \varepsilon_{1i}$ if $HELP_i = 1$
 - @Regime 2 : $Y_{2i} = X_{2i} \beta_2 + \varepsilon_{2i}$ if $HELP_i = 0$

Where Y is the vector of dependant variables and X is the vector of exogenous variables

3. We calculate the average effect of treatment on treated (ATT)

$$ATT = E[Y_{1i} | IH_i = 1, X_{1i}] - E[Y_{2i} | IH_i = 1, X_{2i}]$$

Econometric model

- We compare the $IH=1$ with the $Ihnonr=1$
- We compare the $IHo=1$ with the $Ihnonr=1$
- We compare the $IHr=1$ with the $Ihnonr=1$

Advantage : binary analysis, with the same baseline data.

Results: Determinants of informal help

- All variables related to socio-demographic characteristics (gender, age, seniority, education, disability, part-time) are significantly correlated with the probability to participate to informal help = strength of stereotypes
- Variables related to the organisational design of workstation are significant determinants especially the use of ICTs, intensity of work and hierarchical responsibilities
- Variables that generate changes (major technological change, major reorganisation, restructuring) also favours help

Table 2: Informal help, wage and effort

Results

The comparison of naïve estimators and ATT show the magnitude of selection effects.

Free-riding behaviour of workers who do not reciprocate help

Wage penalty for workers who do not receive help while they give some help

<i>IH</i> : Offered and received informal help				
	<i>Log(Net Wage)</i>		<i>Productive Effort</i>	
	<i>IH = 1</i>	<i>IHnonr = 1</i>	<i>IH = 1</i>	<i>IHnonr = 1</i>
Naive Diff.	9.961	9.877	2.350	2.127
Std. Dev.	0.084*** (0.012)		0.222*** (0.023)	
	<i>E[Y₁ IH = 1]</i>	<i>E[Y₂ IH = 1]</i>	<i>E[Y₁ IH = 1]</i>	<i>E[Y₂ IH = 1]</i>
ATT	9.967	9.708	2.354	2.560
Std. Dev.	0.258*** (0.01)		-0.207*** (0.011)	
<i>IHo</i> : Only offered informal help				
	<i>Log(Net Wage)</i>		<i>Productive Effort</i>	
	<i>IHo = 1</i>	<i>IHnonr = 1</i>	<i>IHo = 1</i>	<i>IHnonr = 1</i>
Naive Diff.	10.025	9.877	2.357	2.127
Std. Err.	0.148*** (0.012)		0.23*** (0.024)	
	<i>E[Y₁ IHo = 1]</i>	<i>E[Y₂ IHo = 1]</i>	<i>E[Y₁ IHo = 1]</i>	<i>E[Y₂ IHo = 1]</i>
ATT	10.038	10.323	2.371	0.749
Std. Err.	-0.286*** (0.01)		1.622*** (0.012)	
<i>IHr</i> : Only received informal help				
	<i>Log(Net Wage)</i>		<i>Productive Effort</i>	
	<i>IHr = 1</i>	<i>IHnonr = 1</i>	<i>IHr = 1</i>	<i>IHnonr = 1</i>
Naive Diff.	9.910	9.877	2.184	2.127
Std. Err.	0.033*** (0.012)		0.056** (0.023)	
	<i>E[Y₁ IHr = 1]</i>	<i>E[Y₂ IHr = 1]</i>	<i>E[Y₁ IHr = 1]</i>	<i>E[Y₂ IHr = 1]</i>
ATT	9.915	9.570	2.184	2.537
Std. Err.	0.346*** (0.011)		-0.353*** (0.011)	

Conclusion

- Informal help networks are driven by both social mechanisms and the organisational design => we observe the strength of stereotypes on informal help
- Informal help acts as a form of peer pressure arising in a team (generally increase effort)
- But it depends of norms of reciprocity.
 - Free-riders are not reciprocating help and benefit from a wage premium
 - Helpers who are not helped (a vulnerable category?) suffer from a wage penalty