



**Who can be trusted and when is it relevant?
The role of trust in employment relations of higher education graduates**

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Summary

This paper aims to advance our understanding of the importance of trust in employment relations in a number of ways. First, we develop a number of direct measures that indicate the trust level in the employment relationship. These relate to the degree of monitoring, the degree of autonomy and the degree of responsibility. Second, we develop direct indicators for characteristics of the work situation that are sometimes associated with trust: measurability of performance, damage potential and innovation. Third, we use data on higher education graduates working in jobs for which their own level of education is required, thereby avoiding possible confounding effects of employing highly educated workers for reasons not related to trust. We find evidence that the three trust indicators represent three distinct dimensions of trust, only rather weakly related to each other and showing distinct patterns of relations with other variables. We also find that the trust indicators are systematically related to the supposed causes of trust, although not always in the expected manner. Similarly, our measures of trust and their supposed antecedents are systematically related to economic sector and firm characteristics, but the relation is often weaker and qualitatively different than many scholars assume. Finally, we find only rather modest effects of trust, in the form of responsibility, on wage levels. Furthermore, the effects of personal, human capital, job and organisation characteristics appear to be mediated at most marginally by trust.

Introduction

Trust is a basic condition for any human cooperation to develop. Wherever humans interact, trust is needed for successful and efficient cooperation. This relates to all areas of human interactions, from the private domain of married couples to the public domain of the well-functioning of a democracy (Hechter and Horne, 2003). Lack of trust either leads to non-cooperative behaviour (Gambetta, 1988) or to high monitoring costs. Both sociologists and economists have long recognised the importance of trust in economic relations. In his landmark paper, Macaulay explains why trust is important in economic relations and argues that "... detailed negotiated contracts can get in the way of creating good exchange relationships ..." (Macaulay, 1963, p. 201). Economists have stressed the importance of trust for the economic performance of organisations (LaPorta et al., 1997; Knack, 2000) as well as the economic performance of countries (Fukuyama, 1995; Knack & Keefer, 1997).

Sitkin and Roth define trust as "... a belief, attitude, or expectation concerning the likelihood that the actions or outcomes of another individual, group or organisation will be acceptable or will serve the actor's interests..." (Sitkin and Roth, 1993, p. 368). They point out that trust is especially important under conditions of uncertainty, interdependence and consequentiality. *Uncertainty* in employment relationships is often cited as a major cause of establishing trust relations between the employee and the employer. Where neo-classical theory assumes that each worker is paid according to his or her productivity, employers face the difficulty that in many situations this productivity is difficult to measure. This may be related to the fact that good output measures are not available or to the fact that an individual's effort cannot easily be distinguished from the effort of others. Workers in such a situation may be inclined to reduce effort, or if pay is based on simple output measures, employees may be induced to allocate their effort to what is being measured instead of what is really important to do the job (Baker, 2000). Employers can invest in *close monitoring* of their employees in order to prevent shirking, but this may be very costly. An alternative is to invest in a trust relationship with the worker, by (among other things) paying a wage above the market clearing rate (Drago & Perlman, 1989; Ewing and Payne, 1999). These so-called efficiency wages give the worker an incentive to work hard and show effort (Akerlof, 1982; Akerlof & Yellen, 1986). Of course, these efficiency wages will only be paid in a situation where this is needed and we may expect that in firms where performance can easily be measured, employers are less inclined to invest in a trust relation and will more closely monitor their worker's effort.

Uncertainty about the worker's effort is not the only reason to invest in trust relations. In many cases, what is expected of employees is not clearly defined and employment contracts are therefore largely incomplete and implicit (Ehrenberg and Smith, 2003). Especially in the case of higher educated employees, productivity does not so much depend on following explicit orders, but rather on creating opportunities that help advance the employers' objectives (Simon, 1991). Employers are therefore *dependent* on the creativity and alertness of their workers to notice these opportunities as they arise

and to act accordingly. Being in a situation in which one is able to make full use of the given opportunities and to take initiatives as they arise, requires a high degree of *autonomy*. Autonomy by definition implies considerable trust in the relation between employees and supervisors (Baker, Gibbons and Murphy, 1994) and employers may only be willing to invest in this type of trust relation when either the expected returns or the monitoring costs are high. We may therefore expect that this autonomy is high in firms that are likely to profit from this autonomy, like firms that are dependent on the innovative behaviour of their workers or in situations where productivity is hard to measure.

As pointed out earlier, *consequentiality* is a third reason for employers to invest in trust relations. Firms may differ in the extent to which underperformance of workers has far-reaching consequences. The output of teachers and medical doctors may be equally easy or difficult to measure, but underperformance in the latter case has more serious direct consequences. *Damage potential* is therefore an important reason for employers to invest in trust relations, usually by applying more thorough screening of applicants or by offering higher wages. In practice, the direction of the causal relation between trust and damage potential may be difficult to distinguish, as damage potential may be a result, as well as a cause, of trust relations. Favoured employees may be entrusted with tasks and responsibilities that have far-reaching consequences. Again this may apply especially to highly educated workers, who often occupy positions in the organisation in which they are responsible for *setting goals and work strategies* for (larger parts of) the organisation. Underperformance in such a situation does not only affect one's own work but greatly affects the work of others in the organisation and therefore has a great damage potential.

A major problem in providing empirical evidence for the theoretical relations described above is that direct measures of the relevant intervening mechanisms are usually lacking. This applies to the extent to which individual productivity can be measured and the damage potential of underperformance as well as to the implied levels of trust and the actual level of productivity. Many scholars have attempted to get around this problem by postulating expected differences between economic sectors or between types of firms regarding these characteristics (for example that certain sectors have a higher damage potential or that shirking is easily detected in small firms (see Rebitzer, 1993)) and then observe whether the actual differences in wage profiles or required job levels are consistent with the theory (Ehrenberg and Smith, 2003). Examples of this approach include the analyses of van der Meer & Wielers (1996), who use expected differences in trust levels between economic sectors and firm size to infer the effects on screening by educational credentials, and Allen (1997), who uses expected differences between sectors in damage potential as well as other characteristics to infer the effects on wages. However, even if one can argue convincingly that certain sectors or firms face *on average* more difficulty in measuring individual performance or have a higher damage potential, this does not apply to every worker in these sectors or these firms, nor that this is the cause of the effects being observed. The same applies to measures of trust. Asserting that in certain sectors higher wages are being paid on average does not necessarily mean that this is related to trust. Again direct indicators of the extent to which workers are being trusted by employers are lacking. What is needed are individual-level data linking firm and job characteristics to measurement problems and damage potential on the one hand and to trust levels on the other hand. Subsequently these trust levels need to be linked to individual outcomes like wages.

Another problem is that many of these analyses are based on cross-sections of the whole labour force. Stronger selection on the basis of educational credentials in sectors or firms that are characterised as 'low information' or 'high risk' is usually taken as a confirmation of the trust relationship, but this is not necessarily the case. Highly educated workers may be hired for many reasons, of which establishing a trust relationship is only one. Even where productivity is hard to measure, expected productivity is presumably the *main* reason to hire highly educated workers, just as standard human capital theory asserts (Becker, 1964). Further, highly educated workers may be employed because of their expected trainability (Thurow, 1975). It may be very difficult to disentangle these effects if one has no information about the actual skills level and productivity of individual workers (Sørensen, 1992), and we do not intend to solve this problem here. However, by concentrating on highly educated workers only, who work in jobs that are appropriate to their high level of training, we will be able to concentrate more explicitly on differences in trust relations between different higher education graduates.

This paper aims to advance our understanding of the importance of trust in employment relations in a number of ways. First, we will develop a number of direct measures that indicate the trust level in the

employment relationship. These relate to the extent to which employees are closely monitored by their supervisors (an indicator of a lack of trust), the degree of autonomy over one's own work and the degree to which one is entrusted with responsibility for organisational goals and strategies. Second, we will use some direct indicators for characteristics of the work situation that are sometimes associated with the degree of trust assigned to an employee: the extent to which individual productivity can be measured, the damage potential for individual underperformance and the degree to which the organisation is directed towards innovation. Third, we will use data on graduates from higher education that are working in a job for which a higher education level is required. In this way we avoid possible confounding effects of employing higher educated for other reasons than for establishing trust relations.

We will elaborate the following research questions:

1. What is the relation between personal characteristics and the trust level of higher educated employees?
2. What is the relation between the extent to which productivity can be measured, damage potential and other relevant job and firm characteristics on the one hand and the trust level of higher educated employees on the other hand?
3. What is the effect of trust level on wages, controlled for relevant personal, job and firm characteristics?

Although much of the analysis will have a descriptive and explorative character, we can formulate in advance a number of concrete hypotheses on the basis of the existing literature:

H1: Firms that are dependent on the innovative behaviour of their workers are more likely to give them autonomy in their own work;

H2: In firms where performance is hard to measure, workers will have more autonomy over their own work;

H3: In firms where performance can easily be measured, employers are less inclined to invest in a trust relation and will more closely monitor their worker's effort.

The remainder of the paper is organised as follows. In section 2 we will elaborate the data and method. Section 3 will present the results and section 4 will conclude with discussion.

Data and Methods

The data used for the analyses were collected for the REFLEX project (full project title 'The Flexible Professional in the Knowledge Society: New Demands on Higher Education in Europe'), an international comparative study of the labour market situation of graduates from tertiary education currently being conducted in 14 European countries and Japan. For this article we only use the data from the Netherlands. In the Netherlands two main types of graduates from tertiary education are distinguished: those who graduate from university, and those who graduate from a college for higher vocational education. A representative sample of 10,000 graduates from tertiary education in the academic year 1999-2000 were approached at the end of 2005. This means that our subjects are individuals who graduated from tertiary education some five years prior to the survey. Around 3,500 graduates responded with a completed questionnaire. To eliminate unwanted heterogeneity in the data, the analyses are restricted to the 2,070 individuals who graduated from a full-time study programme, and who at the time of the survey were no older than 40 years old and were in salaried employment requiring at least their own level of education for at least 12 hours per week. For further information on the REFLEX project, we refer to the project website (<http://www.reflexproject.org>).

The central variables in the analysis consist of three indicators representing three distinct dimensions of trust. The first of the variables consists of the dimension *autonomy over one's own work*. This variable is constructed as a mean of three different five-point scale items. The first of these items is based on the respondents' answers to the question 'To what extent does the job characteristic 'work autonomy' apply to your current work?' The second item is based on respondents' answers to the question 'To what extent are you responsible for setting goals for your own work?', and the third on answers to the question 'To what extent are you responsible for deciding how you do your own job?' Answers on all three questions range from 1 ('not at all') to 5 ('to a very high extent'). A factor analysis was performed on the three variables. The first unrotated factor showed no significant differences in the factor loadings of the three variables. Therefore we decided to use a simple mean of the three underlying items.

The second indicator of trust refers to the dimension *responsibility for organisational goals and strategies*. This variable is constructed as a mean of two different five-point scale items. The first item is based on respondents' answers to the question 'To what extent are you responsible for setting goals for the organisation?', and the second on answers to the question 'To what extent are you responsible for deciding work strategies for the organisation?' Answers on both questions range from 1 ('not at all') to 5 ('to a very high extent'). The items are strongly correlated (Pearson correlation coefficient 0.7), so we use a simple mean of the two items to indicate this dimension of trust.

In contrast to the first two indicators, the third indicator of trust is negatively formulated, and refers to the dimension *closeness of monitoring*, and is based directly on the respondents' answers to the question 'How closely is your individual performance monitored by your own supervisor?' Answers range from 1 ('not very closely') to 5 ('very closely')...

In addition to these three indicators of trust level, a range of variables was included in the analyses to cover characteristics of the respondents' personal situation, their human capital, their job, and the firm or organisation in which they were working. The indicators of the personal situation were gender, age, a dummy variable indicating whether or not graduates had at least one parent who had attained a higher education degree, a dummy variable indicating whether the respondent was born outside the Netherlands, and an indicator of the quality of the respondents' social network. The latter variable was constructed as the mean of three items indicating how useful the respondent felt that his or her social network would be if he or she needed, respectively, information on job opportunities, help in obtaining work, and help in setting up one's own business. All three items were measured on a five-point scale ranging from 1 ('not very useful') to 5 ('very useful').

The human capital indicators were: a dummy representing a masters (i.e. university) level degree (as opposed to a bachelors (i.e. higher vocational education) degree), the average grade obtained during the degree course, a dummy indicating whether one's pre-university education consisted of academic secondary education (as opposed to general or vocational secondary education), a dummy indicating whether the respondent had ever enrolled in any additional higher education programme(s), months of relevant work experience prior to graduation, months of administrative experience in student or voluntary organisations during higher education, the total number of employers since graduation, the total number of months work experience acquired since graduation, and the total number of months unemployed since graduation.

The job characteristics were: a dummy indicating a temporary contract, an indicator of the degree to which one's own performance could be objectively assessed by others, and the extent to which major mistakes or omissions by the respondent in his or her work would be damaging for the firm or organisation. The latter two indicators are measured on five point scales. The indicator of measurability of performance was based on answers to the question 'To what extent can your individual performance be objectively assessed by others (e.g. supervisors, colleagues)' with answers on a scale ranging from 1 ('not at all') to 5 ('to a very high extent'). The indicator of damage potential was based on answers to the question 'How damaging would it be for the organisation if you made major mistakes or omissions in the performance of your work?', measured on a scale ranging from 1 ('hardly damaging') to 5 ('extremely damaging').

Finally, the firm or organisation characteristics were: a series of dummy variables indicating economic sector, a dummy variable indicating that the organisation is subject to strong competition based on quality rather than price, a dummy variable indicating that the demand for the firm's product or service is unstable, a series of dummies indicating the scope of operations of the organisation, an indicator of the extent of innovation in the organisation, a series of dummies indicating the size of the organisation, and two indicators of the degree of interdependence in the respondent's work. The dummies indicating economic sector were based on a well-known classification developed by Stinchcombe (1979), who distinguished 7 sectors: 'traditional primary industries', 'classical capitalist industries', 'small trade and services', 'competitive industries with skilled workers', 'large-scale engineering-based industries', 'bureaucratic services' and 'professional services'. Because only a small number of higher education graduates was employed in the first two categories, these were merged. By contrast, over 60% of graduates were employed in the 'professional services' category, so this was broken into three sub-categories: 'business services' 'education and social services' and 'health services'. The distinction is important, since the three subsectors are likely to be different in crucial respects. As was indicated in the introduction, the measurability of productivity may not differ much between the sectors, but the damage potential in the health services sector is likely to be much higher than in the other professional sectors, because so much more is at stake. Similarly, we might expect innovation to be much more important in the business services sector than in either the health sector or the education and social services sector. The scope of the organisation was broken down onto the categories 'local', 'regional', 'national' and 'international'. The indicator of the extent of

innovation in the organisation, was constructed as a mean of three items reflecting the extent of innovation in respectively 'product or service', 'technology, tools or instruments' and 'knowledge or methods', each of which was measured on a five-point scale varying from 1 ('very low') to 5 ('very high'). The size of the organisation was divided into small (1 to 24 employees), medium (25 to 249 employees) and large (250 or more employees). The degree of interdependence was indicated in terms of the extent to which the result of the respondent's own work are dependent on the performance of others, and the extent to which the results of the work of others was dependent on one's own performance.

The dependent variable in the last multivariate analysis presented in this paper is (the natural logarithm of) the current hourly wage. To avoid the risk of extreme values distorting the results, the lower and upper 0.5% were removed from the wage distribution.

A full description of all the variables is included in appendix 1.

The analyses consist of four ordinary least squares regression analyses. In the first three analyses, the three indicators of trust level are regressed on the personal characteristics, the human capital characteristic, the job characteristics (with the exception of hourly wage), and the organisation characteristics. In the fourth analysis the natural logarithm of hourly wages is regressed on the personal characteristics, the human capital characteristic, the other job characteristics, the organisation characteristics, and the trust indicators. In order to obtain a good view of the relative contribution of the trust indicators and the other variables to wages, three different models are estimated. First of all, the contribution of all the variables except the trust indicators is estimated. Secondly, the contribution of the trust indicators is estimated without the other variables. Finally, the model is estimated with all the variables together.

Results

Before describing the results of the OLS regression analyses, we first describe briefly the distribution of key theoretical variables across economic sectors and firm characteristics, and mutual relationships between the three trust indicators.

As expected, there are considerable differences between economic sectors in the degree to which performance can be measured, the potential for damage if the employee were to make major mistakes or omissions, and in the emphasis placed on innovation (see Figure 1). Respondents working in the industry sectors report generally higher levels of measurability of performance than those working in the service sectors. Reported measurability of performance is particularly low in the education and social services sector. As anticipated, damage potential is particularly high in the health services sector, where major mistakes may have serious health consequences, and in the extreme case result in the death of a patient. The competitive industries sector also shows rather high levels of damage potential, while the traditional primary and classical capitalist industry and education and social services sectors show relatively low levels. Like measurability of performance, innovation is generally higher in the industry sectors than in services, although the differences are less pronounced, and, rather unexpectedly, the bureaucratic services sector shows a level of innovation that is comparable to that in industry.

<Figure 1 about here>

Figure 2 shows the same three indicators, now broken down by the scope of operations of the firm or organisation. Somewhat unexpectedly, measurability of performance increases with the scope of operations. Intuitively, the opposite pattern might be expected: one might expect the performance of an individual employee to be less visible in a multinational organisation than in a firm operating strictly at the local level. Damage potential appears to be only loosely related to scope of operations. Damage potential is slightly lower in internationally oriented firms than in firms whose operations reach no further than the national borders. At first sight, this seems a little strange. However, it should be noted that the question was framed in terms of damage that was likely to be done to the organisation as a whole in the event of major errors or omissions. A large multinational corporation is unlikely to be brought to its knees by a single mistake by a relatively junior staff member. Innovation clearly increases with the scope of operations.

<Figure 2 about here>

Finally, Figure 3 shows the distribution of the same three characteristics across organisations of different sizes. Size is obviously related to scope of operations, so unsurprisingly the pattern is quite similar to that seen in Figure 2. Measurability of performance and innovation increase, and damage potential decreases, with firm size.

<Figure 3 about here>

Table 1 shows the correlations between the three trust indicators.

<Table 1 about here>

As Table 1 shows, the first trust variable, indicating the degree of autonomy in one's own work, is significantly correlated with the other two. The strength of the coefficients is not great however. The correlation coefficient of 0.27 between autonomy and responsibility is only moderate, and that between autonomy and monitoring is quite weak. What's more, the indicators responsibility and monitoring are not at all correlated. These results confirm the expectation that there are several distinct dimensions of trust in work.

Autonomy

Table 2 shows the results of the ordinary least squares regression analysis, with dependent variable the degree of autonomy in one's own work.

<Table 2 about here>

Autonomy is positively related to the perceived quality of one's own social network: well-connected individuals enjoy greater levels of autonomy in their work. Autonomy appears not to be affected at all by other personal characteristics. Females, older workers, graduates with at least one higher-educated parent and foreign-born graduates experience neither more nor less autonomy in their work than, respectively, males, younger workers, graduates without higher educated parents and native-born graduates.

Of the human capital characteristics, only the level of the degree obtained and additional participation in higher education have an effect on autonomy. Masters-level (i.e. university) graduates experience significantly more autonomy than bachelor level (i.e. higher vocational education) graduates. Furthermore, additional investments in other higher education programmes is also associated with somewhat higher levels of autonomy. Average grades, the various forms of experience and one's employment history have no significant effect.

Not altogether surprisingly, a temporary work contract is associated with lower levels of autonomy. Interestingly, the easier it is for others to measure one's own performance, the greater the autonomy in one's work. This runs counter to hypothesis H2, which predicts a negative relation between measurability of performance and autonomy. There is no effect of damage potential on autonomy.

As predicted in hypothesis H1, the degree of innovation in the organisation has a positive effect on job autonomy. This result confirms the notion that innovation cannot be 'squeezed' out of workers, but rather requires a certain amount of autonomy, especially on the part of the most highly qualified workers in an organisation. The positive effect of strong competition based on quality on autonomy is also consistent with this hypothesis. Compared to graduates employed in the business services sector, those working in education and social services experience greater autonomy in their own work. This seems consistent with the image of the teacher as autonomous professional. The stability of demand, scope of operations, size of the organization and degree of interdependence in work appear not to be related to autonomy.

Responsibility

Table 3 shows the results of the analysis with dependent variable the degree of responsibility for organisational goals and strategies.

<Table 3 about here>

Controlled for other relevant characteristics, female graduates experience a lower degree of responsibility for organisational goals and strategies than male graduates. Interestingly, there is a strong effect of social network: the more useful graduates regard their own social network, the more likely they are to bear real responsibility in their work. Older workers, graduates with at least one higher-educated parent and foreign-born graduates experience neither more nor less responsibility in their work than, respectively, younger workers, graduates without higher educated parents and native-born graduates.

Masters-level graduates not only experience significantly more autonomy than bachelor level graduates, but they are also assigned a higher degree of responsibility. The degree of responsibility is not significantly affected by grades achieved in the reference course. Interestingly, academic-level secondary education is negatively related to responsibility. This seemingly counterintuitive result could conceivably be explained by the fact that almost all masters-level graduates have followed academic secondary education, so that the effect of this variable is more or less confined to bachelors-level graduates. All school-leavers with academic secondary qualifications are entitled to go on to masters-level programmes at university. It may be that those who choose to go on to bachelors-level courses at a higher vocational college are less talented and/or less ambitious than those who make use of their option to follow a masters-level programme. Rather unexpectedly, none of the various forms of

experience has any significant effect on responsibility. It does appear however, that having been unemployed for a longer time since graduation has a negative effect on responsibility.

As we saw for autonomy, having a temporary contract lowers the degree of responsibility borne by graduates. In addition, damage potential has a strong positive effect. One may legitimately question the direction of causality here: as was outlined in the introduction, it is plausible that the degree of responsibility is to a considerable extent the reason why mistakes may be costly. There is no effect of measurability of performance.

Compared to graduates employed in the business services sector, those working in traditional primary and classical capitalist industry, small trade and services, bureaucratic services and education and social services experience greater responsibility in their own work. At first sight, the positive effect for the first two sectors seems counter-intuitive. However, on closer consideration, this result probably affects the manner in which the indicator was constructed. These sectors are customarily characterised by smaller firms than most other sectors, and in smaller firms a given worker is likely to bear more responsibility with respect to the organisation as a whole than in larger firms. Indeed, we see a strong effect of organisation size. However, the rough sorting into small, medium and large firms still leaves considerable variance, which appears to be captured to some extent by economic sector. As was the case for autonomy, the degree of innovation in the organisation has a positive effect on responsibility. This suggests that innovative firms are willing to assign a higher degree of responsibility to highly qualified workers than those firms where innovation is less of an issue. Finally, the more the results of others depends on one's own performance, the greater the degree of responsibility. As with damage potential, one may question whether the direction of causality is in the opposite direction here.

Closeness of monitoring

Table 4 shows the results of the analysis with dependent variable the degree to which one's own work is closely monitored.

<Table 4 about here>

Monitoring appears not to be affected at all by most personal characteristics. Only age has a significant effect: older workers report that they are more closely monitored than younger workers. Females, graduates with at least one higher-educated parent and foreign-born graduates experience are monitored neither more nor less in their work than, respectively, males, graduates without higher educated parents and native-born graduates. Nor does the perceived quality of one's own social network have any significant effect on monitoring.

Of the human capital characteristics, only work experience seems to be related to monitoring. The more relevant work experience one has acquired before or during higher education, and the greater the total time worked since graduation, the less closely one's work is likely to be monitored.

As we saw for autonomy and responsibility, workers with a temporary contract are monitored more closely than workers with a fixed contract. In contrast to autonomy however, the easier it is to measure the graduate's performance, the more likely he or she is to be monitored closely. This result confirms the prediction of H3, and suggests that if employers or supervisors can easily measure the performance of their employees, they will avail themselves of the opportunity. This result brings the anomalous effect of measurability on autonomy into starker relief. Further, as was the case with responsibility, damage potential has a strong negative effect on freedom from monitoring. This is more than plausible: when an employer or supervisor knows that mistakes are likely to be costly, they have a strong incentive to watch the employee's work closely to make such mistakes less likely.

Interestingly, none of the organisation characteristics has a significant effect on monitoring.

Wages

Table 5 shows the results of the ordinary least squares regression analysis, with dependent variable the natural logarithm of hourly wages.

<Table 5 about here>

Model 1 shows the results of the wage analyses without inclusion of the trust indicators. For the most part, the results are unsurprising and require little comment. Women earn less than men, older workers receive a wage premium, masters graduates earn more than bachelors graduates, graduates who have worked a lot and been unemployed only a little earn more than graduates with less experience and more time unemployed, temporary workers earn less than permanent workers, employees in education and social services earn less and employees in large-scale engineering-based industries earn more than workers in business services, employees with a higher damage potential receive a wage premium and employees in large firms earn more than this in medium sized firms. One result was at least somewhat unexpected. Graduates who followed academic secondary

education prior to entering higher education earn more than those with a general or vocational secondary qualification. As such, this is not unexpected, except for the fact that this variable showed a negative effect on responsibility. This casts doubt on the tentative explanation proffered for the negative effect on responsibility, namely that this indicates lower ability and/or ambition.

Model 2 shows the effects of the trust indicators on the natural logarithm of wages, without controlling for other characteristics. Consistent with the literature, autonomy and responsibility have a positive effect on wages, albeit rather weak. Monitoring has no effect at all.

Model 3 shows the effects of trust indicators together with the other characteristics. The inclusion of the trust characteristics only marginally affects the effects of the other variables.¹ By contrast, the effect of autonomy almost disappears while the effect of responsibility now appears stronger and more significant after inclusion of the personal, human capital, job and organisation characteristics.

Conclusion and Discussion

In this paper we analyzed the role played by trust in employment relations of higher education graduates. We started by developing indicators for three different dimensions of trust: autonomy, responsibility and (lack of) monitoring. At this juncture it is appropriate to ask to what extent this distinction between these dimensions of the overarching concept of trust has proved useful. We believe that our results show that this distinction is indeed useful. The three dimensions are not only conceptually distinct, but empirically seem to measure quite different things. The correlations between these dimensions range from moderate (between autonomy and responsibility), through weak (between autonomy and monitoring) down to non-existent (between responsibility and monitoring). In addition, the pattern of effects of causal variables in the multivariate analyses is quite different for the three dimensions. For example, men are assigned more responsibility, but no more autonomy than women, and are monitored neither more nor less. Graduates with a good social network also only differ significantly from graduates with a less useful social network on the dimension of responsibility. Compared to bachelors graduates, masters graduates enjoy both extra autonomy and responsibility, but are not monitored significantly more or less.

A more specific question is to what extent the three dimensions of trust are related to theoretical concepts that are frequently cited in the literature as cause of trust, namely damage potential, measurability of performance and innovation. Again, the answer is yes, although not always in the manner that was predicted. As was predicted in hypothesis H1, firms that are dependent on the innovative behaviour of their workers are more likely to give them autonomy in their own work. Hypothesis H3 was also confirmed: in firms where performance can easily be measured, employers more closely monitor their workers' effort. Despite this, hypothesis H2 was not confirmed: in firms where performance is hard to measure, do not have more autonomy over their own work. In fact, the opposite is true: the easier it is to measure performance, the more autonomy workers have. Although not explicitly formulated in the form of hypotheses, the pattern of effects of damage potential is consistent with the theoretical literature: a high damage potential is positively related both to responsibility (those who can do the greatest damage bear the greatest responsibility) and to monitoring (employers like to keep a good eye on those who could inflict the greatest damage).

In the absence of direct indicators for trust, some scholars have used proxies based on, for example, economic sector or organisation size. It is worth pondering at this point to what extent our measures of trust and their supposed antecedents measurability, damage potential and innovation are in fact systematically related to economic sector and firm characteristics. The answer is that these concepts are systematically related, but that the relationship is not always as strong or even in the same direction as these scholars assume. Contrary to what for example van der Meer and Wielers (1996) assume, the professional services cannot be consistently or uniformly characterised as 'high-trust' sectors. The bureaucratic, business and health services sectors do not show particularly high levels of autonomy, and workers in traditional primary and classical capitalist industries and small trade and services (described by van der Meer and Wielers as typical 'low-trust' sectors) report higher levels of responsibility than in the so-called 'high-trust' sectors. There are no significant differences between sectors in the closeness of monitoring. Nor is the often-cited relation between firm size and measurability of performance confirmed. On the contrary, workers in large firms report a higher degree of measurability than those in smaller firms. Even taking into account the subjective nature of our

¹ The change between model 1 and 3 from significance to non-significance of the variable damage potential is due to small changes in both the B-coefficient and the standard error, which due to rounding errors are not apparent in the table.

measures, these results give good reason to doubt the automatic assignment of trust and trust-related characteristics on the basis of membership of one of these aggregate categories.

A final question to be considered is to what extent the existence of trust constitutes a reason to pay higher wages. In fact, our wage analysis shows only rather modest effects of trust, in the form of responsibility, on wage levels. Autonomy and monitoring have no significant effect on wage levels, after controlling for other relevant characteristics. Furthermore, the effects of personal, human capital, job and organisation characteristics appear to be mediated at most marginally by trust. Again, even taking into account the subjective nature of our measures, these results should give pause to those who have interpreted wage effects of various proxies as 'trust-effects'.

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Tables and Figures

Figure 1: Mean level of measurability of performance, damage potential and innovation, by economic sector

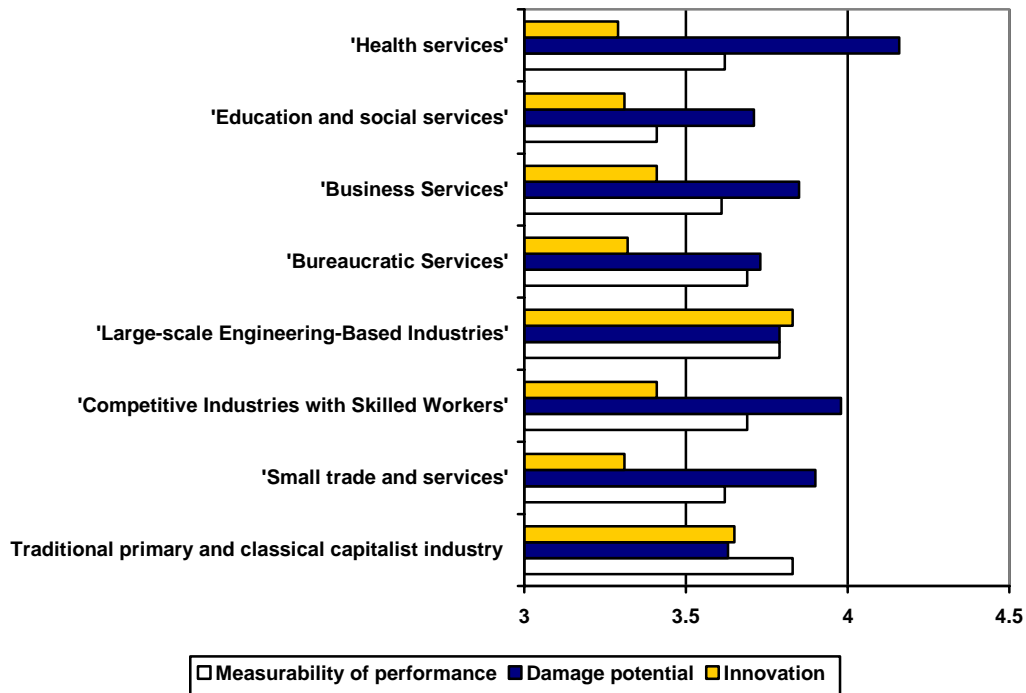


Figure 2: Mean level of measurability of performance, damage potential and innovation, by scope of operations

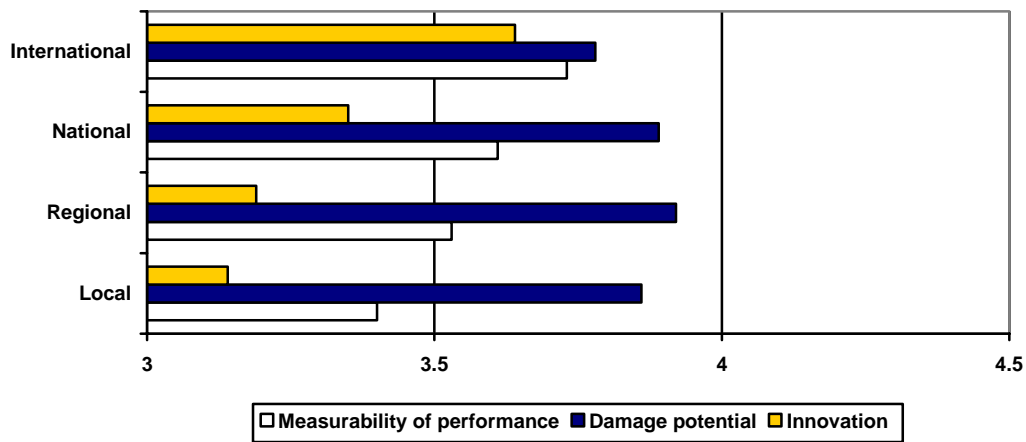


Figure 3: Mean level of measurability of performance, damage potential and innovation, by organisation size

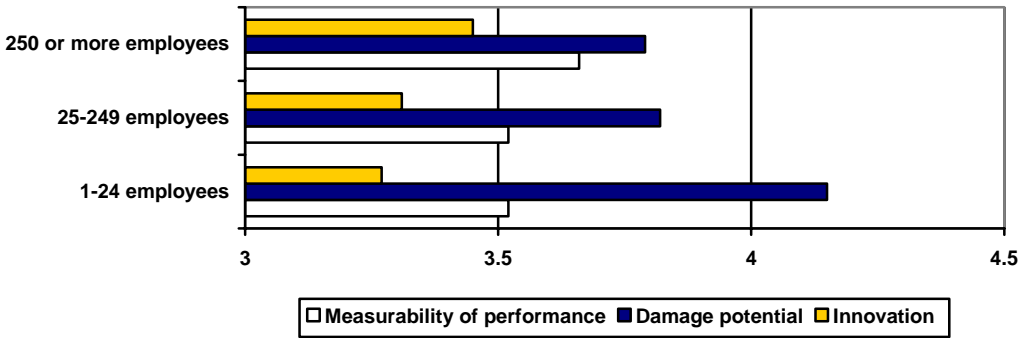


Table 1: Pearson correlation coefficients between three trust indicators

	Autonomy in own work	Responsibility
Responsibility	0.27**	
Closeness of monitoring	-0.07**	0.00

Table 2: Results of ordinary least squares regression analysis, dependent variable: autonomy in own work

	B	Std. Error
<i>Personal characteristics</i>		
Gender (female)	0.049	0.032
Age at time of survey	0.015	0.008
At least one parent has higher education	0.029	0.029
Born outside the Netherlands	0.075	0.049
Social network useful	0.038*	0.016
<i>Human capital characteristics</i>		
Reference degree master level	0.119**	0.040
Average grade in reference course	0.034	0.027
Academic secondary education	-0.008	0.034
Additional higher education followed	0.060*	0.030
Relevant work experience prior to graduation	0.000	0.001
Administrative experience during course	0.001	0.001
Number of employers since graduation	-0.006	0.010
Total months employed since graduation	0.002	0.001
Total months unemployed since graduation	-0.006	0.006
<i>Job characteristics</i>		
Temporary contract	-0.133**	0.039
Measurability of own performance	0.039*	0.016
Damage potential	-0.009	0.016
<i>Organisation characteristics</i>		
Economic sector (reference: Business services)		
• Trad. primary and class. capitalist industry	0.030	0.097
• Small trade and services	0.076	0.062
• Competitive Industries with Skilled Workers	-0.093	0.067
• Large-scale Engineering-Based Industries	-0.071	0.061
• Bureaucratic Services	0.016	0.047
• Education and social services	0.237**	0.052
• Health services	-0.008	0.055
Strong competition based on quality	0.117**	0.033
Unstable demand	-0.009	0.033
Scope of operations (reference: National)		
• Local	-0.014	0.056
• Regional	-0.054	0.044
• International	0.026	0.040
Degree of innovation	0.073**	0.019
Organization size (reference: 25-249 employees)		
• 1-24 employees	0.058	0.050
• 250 or more employees	-0.030	0.034
Own results dependent on performance of others	0.018	0.018
Results of others dependent on own performance	0.008	0.019
<i>Constant</i>	2.553**	0.351

Adj. R-square = 0.07; N = 1,719

Table 3: Results of ordinary least squares regression analysis, dependent variable: responsibility for organisational goals and strategies

	B	Std. Error
<i>Personal characteristics</i>		
Gender (female)	-0.125*	0.056
Age at time of survey	0.007	0.014
At least one parent has higher education	0.050	0.050
Born outside the Netherlands	0.041	0.085
Social network useful	0.108**	0.027
<i>Human capital characteristics</i>		
Masters degree level (reference: bachelors)	0.188**	0.068
Average grade in reference course	0.084	0.046
Academic secondary education	-0.258**	0.058
Additional higher education followed	-0.029	0.052
Relevant work experience prior to graduation	0.000	0.001
Administrative experience during course	-0.001	0.002
Number of employers since graduation	-0.009	0.016
Total months employed since graduation	-0.001	0.002
Total months unemployed since graduation	-0.022*	0.011
<i>Job characteristics</i>		
Temporary contract	-0.347**	0.067
Measurability of own performance	0.002	0.028
Damage potential	0.098**	0.027
<i>Organisation characteristics</i>		
Economic sector (reference: Business services)		
• Trad. primary and class. capitalist industry	0.387*	0.166
• Small trade and services	0.467**	0.107
• Competitive Industries with Skilled Workers	0.012	0.116
• Large-scale Engineering-Based Industries	0.094	0.105
• Bureaucratic Services	0.173*	0.081
• Education and social services	0.288**	0.089
• Health services	-0.035	0.094
Strong competition based on quality	-0.007	0.057
Unstable demand	0.027	0.056
Scope of operations (reference: National)		
• Local	0.031	0.096
• Regional	0.014	0.076
• International	-0.094	0.068
Degree of innovation	0.101**	0.032
Organization size (reference: 25-249 employees)		
• 1-24 employees	0.401**	0.086
• 250 or more employees	-0.220**	0.059
Own results dependent on performance of others	0.059	0.031
Results of others dependent on own performance	0.140**	0.033
<i>Constant</i>	0.440	0.601

Adj. R-square = 0.15; N = 1,719

Table 4: Results of ordinary least squares regression analysis, dependent variable: degree to which own work is closely monitored

	B	Std. Error
<i>Personal characteristics</i>		
Gender (female)	0.047	0.051
Age at time of survey	0.034**	0.013
At least one parent has higher education	-0.051	0.046
Born outside the Netherlands	-0.031	0.078
Social network useful	-0.012	0.025
<i>Human capital characteristics</i>		
Masters degree level (reference: bachelors)	0.073	0.063
Average grade in reference course	-0.003	0.043
Academic secondary education	0.042	0.054
Additional higher education followed	-0.011	0.048
Relevant work experience prior to graduation	-0.003*	0.001
Administrative experience during course	-0.001	0.001
Number of employers since graduation	-0.010	0.015
Total months employed since graduation	-0.005*	0.002
Total months unemployed since graduation	-0.010	0.010
<i>Job characteristics</i>		
Temporary contract	0.228**	0.062
Measurability of own performance	0.498**	0.026
Damage potential	0.099**	0.025
<i>Organisation characteristics</i>		
Economic sector (reference: Business services)		
• Trad. primary and class. capitalist industry	0.233	0.154
• Small trade and services	0.023	0.099
• Competitive Industries with Skilled Workers	0.010	0.107
• Large-scale Engineering-Based Industries	0.087	0.098
• Bureaucratic Services	0.015	0.075
• Education and social services	-0.023	0.083
• Health services	0.042	0.087
Strong competition based on quality	0.018	0.052
Unstable demand	-0.004	0.052
Scope of operations (reference: National)		
• Local	-0.034	0.089
• Regional	-0.009	0.071
• International	0.068	0.063
Degree of innovation	0.040	0.030
Organization size (reference: 25-249 employees)		
• 1-24 employees	-0.012	0.080
• 250 or more employees	0.078	0.054
Own results dependent on performance of others	-0.032	0.029
Results of others dependent on own performance	0.059	0.030
<i>Constant</i>	-0.306	0.538

Adj. R-square = 0.23; N = 1,719

Table 5a: Results of ordinary least squares regression analysis, dependent variable: Ln (hourly wage) (model 1)

	B	Std. Error
<i>Personal characteristics</i>		
Gender (female)	-0.033**	0.012
Age at time of survey	0.015**	0.003
At least one parent has higher education	0.003	0.011
Born outside the Netherlands	0.009	0.019
Social network useful	0.024**	0.006
<i>Human capital characteristics</i>		
Masters degree level (reference: bachelors)	0.154**	0.015
Average grade in reference course	0.010	0.010
Academic secondary education	0.037**	0.013
Additional higher education followed	0.019	0.012
Relevant work experience prior to graduation	0.000	0.000
Administrative experience during course	0.000	0.000
Number of employers since graduation	0.006	0.004
Total months employed since graduation	0.001**	0.001
Total months unemployed since graduation	-0.005*	0.002
<i>Job characteristics</i>		
Temporary contract	-0.117**	0.015
Measurability of own performance	-0.009	0.006
Damage potential	0.012*	0.006
<i>Organisation characteristics</i>		
Economic sector (reference: Business services)		
• Trad. primary and class. capitalist industry	0.035	0.037
• Small trade and services	-0.035	0.024
• Competitive Industries with Skilled Workers	-0.044	0.026
• Large-scale Engineering-Based Industries	0.056*	0.024
• Bureaucratic Services	0.014	0.018
• Education and social services	-0.092**	0.020
• Health services	-0.025	0.021
Strong competition based on quality	-0.006	0.013
Unstable demand	0.002	0.013
Scope of operations (reference: National)		
• Local	-0.003	0.021
• Regional	-0.005	0.017
• International	-0.014	0.015
Degree of innovation	-0.012	0.007
Organization size (reference: 25-249 employees)		
• 1-24 employees	0.003	0.019
• 250 or more employees	0.033*	0.013
Own results dependent on performance of others	-0.001	0.007
Results of others dependent on own performance	0.005	0.007
<i>Constant</i>	2.160**	0.135

Adj. R-square = 0.25; N = 1,719

Table 5a: Results of ordinary least squares regression analysis, dependent variable: Ln (hourly wage) (model 2)

	B	Std. Error
<i>Trust indicators</i>		
Autonomy in own work	0.024*	0.011
Responsibility	0.012*	0.006
Closeness of monitoring	0.003	0.006
<i>Constant</i>	2.668**	0.047

Adj. R-square = 0.01; N = 1,719

Table 5a: Results of ordinary least squares regression analysis, dependent variable: Ln (hourly wage) (model 3)

	B	Std. Error
<i>Personal characteristics</i>		
Gender (female)	-0.031*	0.012
Age at time of survey	0.015**	0.003
At least one parent has higher education	0.002	0.011
Born outside the Netherlands	0.008	0.019
Social network useful	0.022**	0.006
<i>Human capital characteristics</i>		
Masters degree level (reference: bachelors)	0.151**	0.015
Average grade in reference course	0.008	0.010
Academic secondary education	0.041**	0.013
Additional higher education followed	0.019	0.012
Relevant work experience prior to graduation	0.000	0.000
Administrative experience during course	0.000	0.000
Number of employers since graduation	0.006	0.004
Total months employed since graduation	0.001**	0.001
Total months unemployed since graduation	-0.005*	0.002
<i>Job characteristics</i>		
Temporary contract	-0.109**	0.015
Measurability of own performance	-0.004	0.007
Damage potential	0.012	0.006
<i>Organisation characteristics</i>		
Economic sector (reference: Business services)		
• Trad. primary and class. capitalist industry	0.031	0.037
• Small trade and services	-0.042	0.024
• Competitive Industries with Skilled Workers	-0.043	0.026
• Large-scale Engineering-Based Industries	0.056*	0.024
• Bureaucratic Services	0.011	0.018
• Education and social services	-0.098**	0.020
• Health services	-0.024	0.021
Strong competition based on quality	-0.006	0.013
Unstable demand	0.001	0.013
Scope of operations (reference: National)		
• Local	-0.004	0.021
• Regional	-0.005	0.017
• International	-0.012	0.015
Degree of innovation	-0.014	0.007
Organization size (reference: 25-249 employees)		
• 1-24 employees	-0.004	0.019
• 250 or more employees	0.037**	0.013
Own results dependent on performance of others	-0.002	0.007
Results of others dependent on own performance	0.003	0.007
<i>Trust indicators</i>		
Autonomy in own work	0.006	0.010
Responsibility	0.015**	0.006
Closeness of monitoring	-0.010	0.006
<i>Constant</i>	2.136**	0.136

Adj. R-square = 0.25; N = 1,719

Appendix 1: Description of variables used

	Minimum	Maximum	Mean	%
<i>Personal characteristics</i>				
Gender (female)	0.0	1.0	-	62
Age at time of survey	25.0	40.0	29.0	-
At least one parent has higher education	0.0	1.0	-	46
Born outside the Netherlands	0.0	1.0	-	10
Social network useful (mean of 3 indicators)	1.0	5.0	3.4	-
<i>Human capital characteristics</i>				
Masters degree level	0.0	1.0	-	32
Average grade in reference course	6.0	9.0	7.4	-
Academic secondary education	0.0	1.0	-	49
Additional higher education followed	0.0	1.0	-	42
Relevant work experience prior to graduation	0.0	168.0	7.5	-
Administrative experience during course	0.0	96.0	10.1	-
Number of employers since graduation	0.0	45.0	2.1	-
Total months employed since graduation	0.0	72.0	54.6	-
Total months unemployed since graduation	0.0	48.0	0.8	-
<i>Job characteristics</i>				
Temporary contract	0.0	1.0	-	20
Measurability of own performance	1.0	5.0	3.6	-
Damage potential	1.0	5.0	3.8	-
Ln(hourly wage)	1.7	3.8	2.8	-
<i>Organisation characteristics</i>				
Economic sector				
• Trad. primary and class. capitalist industry	0.0	1.0	-	2
• Small trade and services	0.0	1.0	-	7
• Competitive Industries with Skilled Workers	0.0	1.0	-	6
• Large-scale Engineering-Based Industries	0.0	1.0	-	7
• Bureaucratic Services	0.0	1.0	-	19
• Business Services	0.0	1.0	-	19
• Education and social services	0.0	1.0	-	22
• Health services	0.0	1.0	-	16
Strong competition based on quality	0.0	1.0	-	29
Unstable demand	0.0	1.0	-	25
Scope of operations				
• Local	0.0	1.0	-	12
• Regional	0.0	1.0	-	27
• National	0.0	1.0	-	22
• International	0.0	1.0	-	40
Degree of innovation	1.0	5.0	3.4	-
Organization size				
• 1-24 employees	0.0	1.0	-	12
• 25-249 employees	0.0	1.0	-	28
• 250 or more employees	0.0	1.0	-	61
Own results dependent on performance of others	1.0	5.0	3.3	-
Results of others dependent on own performance	1.0	5.0	3.3	-
<i>Trust indicators</i>				
Autonomy in own work	1.0	5.0	4.1	-
Responsibility	1.0	5.0	2.5	-
Closeness of monitoring	1.0	5.0	3.1	-