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► **To cite this version:**

Matthijs den Besten, Walid A Nakara. Innovation among budding freelancers in France. EGOS European Group of Organizational Studies, Jul 2014, Rotterdam, Netherlands. halshs-02092395

HAL Id: halshs-02092395

<https://shs.hal.science/halshs-02092395>

Submitted on 8 Apr 2019

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Innovation among budding freelancers in France

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Abstract

The purpose of this paper is to explore the relationship between the adoption of freelance as organizational form and innovation as activity. This exploration fills a research gap as freelancers rarely feature in studies on innovation and entrepreneurship. The approach taken link self-declared innovation activity with criteria associated with freelance activity among responses to the survey of new firms carried out by INSEE in France in 2002 and assess the relative success of those who innovate. In order to analyze the data we recursively partition the survey population into subgroups with a similar inclination to innovation on the basis of the criteria that define freelancing. We then test for correlation between respondents' preference for innovation and the number of criteria for freelancing they meet. We repeat this exercise for a subset of respondents from firms in the innovative sector. We find that features associated with freelance organizations do not usually translate into a higher propensity to innovate. Among firms active in an innovative sector the effect is even stronger.

Keywords

Innovation; innovative organizations; freelance; self-employment; portfolio-workers; France; recursive partitioning; SINE; INSEE;

Introduction

Freelancers appear to become more and more present among today's workforce, while at the same time yesterday's "organization man" seems to be on his way out. This presence is palpable through the spread of co-working facilities typically occupying "an abandoned architectural relic of some long-ago economic boom" (NYR 2014). The question that this paper tries to address is whether the apparently growing importance of freelancing should be considered as a positive or negative development. More in particular, what the likelihood is that freelancers will engage in innovation and thus contribute positively to the long-term development of the economy. Our unit of analysis is the entrepreneur, specifically people who took up or took over a firm in France in 2002. Among these people we identify those that can be considered freelancers and those among them that can be considered as innovators. While freelancing has been identified as enabling entrepreneurs to achieve scale (Burke 2011) and product design companies to gather diverse ideas (Andriopoulos and Lewis

2010), it is not immediately clear where freelancers would find time to explore innovative approaches given the day-to-day pressures they are under (Osnowitz 2010).

This paper is organized as follows: we start with a review of the various aspects that are associated with freelancing in the literature. Next, we point out where and how we think to find indicators for these aspects among data related to France and we describe what we found looking at entrepreneurs becoming active in 2002. We interpret the findings and list avenues for further research.

Literature Analysis

Freelancing is one of the many labels that have been proposed by scholars to give a name to novel forms of the organization of work that they observed beyond more the more traditional categories of the employee and the entrepreneur. There are several dimensions to freelancing (Kitching & Smallbone, 2012). Typically, it implies the absence of a boss; that is, freelancers are responsible themselves for obtaining and honoring contracts. Apart from themselves freelancers typically do not engage anyone; they are self-employed. Freelancers typically work for a company or a government agency on short-term contracts. Successful freelancers are engaged in a portfolio of projects keeping them fully engaged. Furthermore, freelancers typically provide services, which require analytical skills associated with a university degree. The emergence of freelancing appears to be the result to a combination of “pull” and “push” factors acting on the workforce. Among the pull-factors one can distinguish for instance the quest for self-realization. Among the push-factors, freelancing can be seen as accommodating the restructuring and downsizing of large and medium sized enterprises. The trigger for reorganization by these firms, in turn, might be down to changes in the labor market, but also the advent of recession in the business cycle or structural changes in the environment. Table 1 provides a summary of variety of terms and concepts proposed in relation to freelancing in the literature. Paths through the literature suggest various alternative accounts of cause and effect. For instance, one could argue that the gradual development of market institutions has rendered the organizational bureaucracies of large firms obsolete. That is why they were forced to focus on their core competencies and acquire peripheral competencies from specialized independent suppliers. To resulting atomization of work may have put some of these suppliers in a situation of social isolation, which is a vice that co-working spaces seek to remedy. Whatever might be its cause and effect, the variety of forms that can be captured under the umbrella of freelancing is, in France, also reflected in the diversity of legal frameworks that were created by the state in order to accommodate for these specific forms of work. Freelancers can self-identify as “profession libérale”, as “travailleur indépendant”, as “auto-entrepreneur” (since 2009) and to some extent even as “intermittent du

spectacle". The key question here seems to be not so much how exactly one should define freelancing but whether its emergence in balance is a positive development that should be encouraged or rather a negative one that should be mitigated.

Innovation is widely recognized as being vital for society. One can also claim that the ability to contribute to innovations is a sign of fulfillment in professional life. Hence, an important element to take into account in an assessment of the benefits and drawbacks of freelancing for society as a whole and for freelancers more in particular would seem to be their ability to innovate. Innovation involves the implementation and exploitation of ideas in contexts in which they haven't been applied before. Innovation comes in many shapes and forms. An innovation can be the proposition of a new product or service to a client, it can be the introduction of improvement to the production process, it can be the introduction changes in the ways a company is managed and so on and so forth. Traditionally entrepreneurs have been identified as drivers of change. Subsequent research has highlighted the superb ability of large firms to facilitate continuous innovation relying on the guidance of managers and the creativity of employees. Within innovation teams in firms a variety of roles, such as sponsor, gatekeeper and champion have been identified as instrumental in bringing an innovation about. If we accept the view of the freelancer as a hybrid between the employee and the entrepreneur (Witteloostuijn), the potential for the freelancer to contribute to innovations depends on whether the employee and entrepreneur traits retained act as inhibitor or as catalyst. Does a freelancer have the same leeway as an entrepreneur to take risks? How does a freelancer find time to explore new ideas in light of the recurring need for new clients and without a manager to shelter him or her from short-term pressures? Note that the role of freelancers can be active, through the introduction of novelty to client organizations or in the way they organize their work, but also more passive by relaying ideas from others (Bessant) or merely by allowing their clients to pursue their innovation more effectively and at a lower cost (Burke). Either way, the contribution of freelancers as facilitators of innovation can be seen as beneficial to society.

Method

Considering that freelancing is an emerging organizational form it would seem premature to try to pin it down to one specific definition. Instead, we propose a list of features that are often associated with freelancing and try to collect data on all the gradations of freelance that exhibit one or more of these features. Thus we can assess the extent to which observations are dependent on specific choices and start to identify the features that seem particularly important. The precondition for this is of course that the features really describe the whole range of features associated with freelancing.

In order to assess the degree in which freelancers innovate, we rely on two types of judgment. The first judgment is extrinsic, are freelancers active in a sector that is considered to be innovative, and the second is intrinsic, do freelancers feel that they are innovators. The combination of both judgments gives an indication of the type of innovation that freelancers are engaged in.

Our focus in this paper is on entrepreneurs who established or took up firms in 2002. We rely on data collected by INSEE among all 92 966 firms newly-established and re-established in that year (SINE)¹. As responding to the survey was made mandatory under French law, the response rate is close to 100%. A potential advantage of this particular data set in addition to its completeness is that INSEE has carried out similar surveys before and after making it feasible to repeat the exercise we propose here in order to discern long-term trends.

There are a number of questions in the survey that relate to freelancing in one-way or another. For now, we would like to focus on questions that can be linked to the dimensions of freelancing defined by Kitching and Smallbone (2012). The first dimension concerns the extent in which respondents can be regarded as self-employed. A simple indicator for this is the number of salaried employees at the time of creation of the firm. In this case, those with zero employees can be considered self-employed. The second dimension concerns the skill level and type of occupation of respondents. Here the indicator used is to check whether respondents obtained a degree in science, the arts, social science, or in management. The third dimension concerns the nature of the client base. Does the respondent have mainly individuals as clients or mainly corporate and government clients? In the latter case a respondent is more likely to qualify as a freelancer. The fourth dimension concerns the number of clients. Here the criterion adopted is whether the respondents had more than one client in 2002. Dimension number five concerns job security in terms of the duration of contracts. Unfortunately, SINE does not contain information specifically related to contracts. It does, however, ask respondents to identify major changes in its client base in the follow up survey of 2005. The advent of major changes would seem a good indicator of the relative lack of job security associated with freelancers. Finally, dimension number six concerns the level of dedication respondents declare to have to their firm. Here we can distinguish between those who declare other activities on the side and those who do not. See table 1 for a summary listing of the indicators employed for each dimension.

With respect to innovation we follow the definition of innovative sectors elaborated by the “Service des études et des statistiques industrielles” (Sessi) for the external judgment on the innovative

¹ <http://www.insee.fr/en/methodes/default.asp?page=definitions/sys-info-nouvelles-entrep.htm>

character of a firm. For the internal judgment we consider the answer respondents give to the question “Do you have an innovative activity?” in the survey of 2002.

On the basis of the 6 indicators for freelancing one can define 64 variants of freelancing by combinations of one or more of these indicators. For each of these variants we can check for the relation with innovation by means of cross tabulations.

Results

Without consensus on the exact criteria for freelancers, it is hard to assess the importance of this form of work. Figure 1 plots the proportion of freelancers relative to the number of people who started a new firm in 2002 for all 64 combinations of the 6 criteria in table 2 that could be met. The shaded area indicates the range of possible proportions. They range from 75% for the self-employed (“a”) and 90% for entrepreneurs with more than one client (“d”) to 66% for self-employed with more than one client and 0.5% of people who meet all six criteria. It appears that criterion “e” (short contract duration and more generally important changes in client base) is the one that is met by the lowest proportion of people overall (7%) and by an even lower proportion of people who meet other criteria such as self-employment (5%). The proportion of freelancers according to the set of criteria that most closely matches the definition of Kitching and Smallbone (2012), “ab”, is limited to 14%. The proportion of freelancers matching this definition among entrepreneurs overall is likely to be slightly higher as the proportion of them who stay active at least 5 years (54%) is considerably higher than the proportion of respondents who stay active during this period overall (42%).

Figure 2 shows the proportions of freelancers for the same set of criteria among entrepreneurs active in what INSEE identifies as an innovative sector. For most combinations, it appears that the proportion of freelancers in innovative sectors is higher than the proportion in other sectors. There are a couple of exceptions, however: compared to entrepreneurs overall, the proportion of people with more than one client, “d”, is 21 percentage points lower; the proportion of people without a secondary activity, “f”, is 7 percentage points lower; the proportion of people in self-employment with more than one client, “ad”, is 14 percentage points lower while the proportion of people in self-employment without a secondary activity, “af”, remains virtually unchanged; and the proportion of people in self-employment without a secondary activity and with more than one client, “adf”, is 17 percentage points lower. Nevertheless, on average the proportion of freelancers in innovative sectors is more than 2.5 times higher than the proportion of freelancers who meet the same criteria in other sectors. In case of “abcf” – self-employed people with a high level of education, only

business or government clients and no secondary activity – the proportion is even more than 5 times higher.

Figure 3 shows the proportions of freelancers who declare that they are engaged in innovation for the 64 combinations of criteria under consideration. For most combinations the proportion of freelancers who declare themselves to be innovative is significantly higher than the proportion of people who declare themselves to be innovative and do not meet the criteria for freelance. Among self-employed, however, the proportion of innovators is lower than among entrepreneurs who engaged employees at the start of their business. Furthermore, innovation seems less likely for people without a secondary activity. Overall, a high level of education, criterion “b”, is associated with a high proportion of innovators. At the same time, also uncertainty due to changes in the client base, “e”, is associated with high levels of innovators.

Figure 4 shows the proportions of freelancers who declared that they are engaged in innovation in innovative sectors. As one would expect, the overall proportion of respondents who declare that they are innovative, indicated by the dotted line, is higher among entrepreneurs in innovative sectors than in the economy as a whole. For a variety of definitions of freelancers, however, the proportion of respondents who declare that they are innovative is significantly lower within innovative sectors. In contrast to the declaration patterns that include all sectors, in the innovative sectors, a high level of education is associated with a low proportion of innovators.

Discussion

The results presented above represent a first attempt to assess the importance of freelancing as activity in France and a preliminary exploration of the question whether more of this activity would be positive or negative for the persons involved and for society as a whole. At this stage, we cannot provide definite answers yet. Nevertheless, it seems safe to conclude that a considerable proportion of entrepreneurs in France have features often associated with freelancing. As noted before (Jaouen and Lasch, 2013) in France there exist many very small firms. In addition it appears that for many of the entrepreneurs leading their firm constitutes their primary activity and typically they serve a variety of clients. It is not straightforward to draw a direct comparison with the estimation of the number of freelancers in the UK made by Kitching and Smallbone (2012). The relative large proportion of freelancers identified among new entrepreneurs may not translate in a large proportion of freelancers in the workforce given the low level of entrepreneurship in France in general (Lasch and Yami, 2008). The introduction of “auto-entrepreneurship” as new legal regime in 2009 has resulted in an increase in the number of registered entrepreneurs more recently, however.

At the same time, the existence of a specific regime for so-called “intermittents” for people working on theatre performances or other artistic events means that these people do not appear among entrepreneurs, even though they share many features with freelancers. Despite all these uncertainties, the number of freelancers under most definitions would seem substantial enough to warrant attention from policy makers.

The question whether freelancing as activity should be valued positively or negatively is answered in part by the level of engagement of freelancers in innovation. Our results show that the proportion of freelancers among new entrepreneurs in innovative sectors is even larger than their proportion in other sectors. This suggests the move towards freelancing does not only serve as a means for companies to reduce cost, but that they also contribute to further economic development. In addition, many of the freelancers declare to be engaged in innovation. Among the factors that appear to influence the likelihood of innovating, education level attained comes out clearly. This would seem to confirm the importance of knowledge for the economy (Foray, 2006). Interestingly, among the freelancers in innovative sectors, a high education level is associated with a lower likelihood to be engaged in innovation. This may be because people with credentials have the opportunity to sell specialized services to companies engaged in innovation whereas people without such credentials need to rely on themselves for innovation.

Thus, the positive effects of freelancing either by helping other firms to innovate or by getting the freedom to innovate themselves seem to outweigh any negative effects from marginalization. Furthermore negative effects could be alleviated by the promotion of innovations in the organization of work such as co-working (Howells, 2012; Gertler, 2003).

Conclusion

In this paper we have presented a preliminary exploration of the relationship between the adoption of work styles associated with freelancing and engagement in innovation. Freelancing is relatively novel way to organize work and consequently no strong consensus exists among policy makers and scholars yet as to its exact definition. Nevertheless it is possible to identify a number of criteria that are generally associated with freelancing. We adopt six criteria identified in the literature and apply them to entrepreneurs who started or took up a firm in 2002 in France. More in particular, we define 64 variants of freelancing based on the 64 possible combinations of one or more criteria that can be met and determine for each variant how many of the respondents meet its criteria and what proportion of them declare that they are engaged in innovation or are active in a sector that is recognized as being innovative.

We find that although there is a large variety in the number of entrepreneurs that can be labeled as freelancer depending on the choice of criteria to be met, it is generally the case that the proportion of respondents who can be considered freelancer is larger among firms in sectors of activity that are deemed to be innovative than the corresponding proportion among firms in other sectors. With regards to self-assessment we find that notwithstanding a few notable exceptions, typically a larger proportion of freelancers feel they are engaged in innovation than entrepreneurs overall. Furthermore we find this to be the case as well among freelancers in innovative sectors. Interestingly, the proportion of innovators among freelancers tends to be lower for variants that include formal education level achieved as one of its criteria. Needless to say, this paradox deserves to be analyzed in more detail.

There are several ways to refine the research presented here. There might be better means to capture the dimensions of freelancing identified. For instance, rather than taking the number of salaried employees at the start of firm as indicator for self-employment we could look at the size of the firm after a couple of years, we could take into account the number of unsalaried persons tied to the firm, or look at a combination of both. Similar avenues could be explored for the other five dimensions. Nor can we fully exclude the possibility that there might be relevant dimensions which we have overlooked. Also with regards to innovation it is possible to come up with different and potentially better methods of measurement. For instance, our data allow us to check whether respondents continue to declare to be engaged in innovation three or five years down the line. Furthermore, we can look for other factors associated with innovation such as the extent to which respondents indicate that they try to acquire new knowledge. Readily available information with respect to innovation outcomes is more limited however.

In addition to these refinements, there are several avenues for future research. First of all, it would be useful to get a more complete picture of the freelancers engaged in innovation and their clients. Besides, it might be of interest to assess the extent to which the networks of firms that freelancers are engaged with manage to innovate independent of the freelancer's individual propensity to innovate. Finally, it would be worthwhile to apply our analysis to earlier and later generations of entrepreneurs in France and elsewhere to corroborate the intuition that freelance is growing in importance.

Acknowledgements

This research received financial support from the French National Research Agency through the program "Investments for the Future" for LabEx Entreprendre. An earlier version has been presented

at IECER 2014 and has been presented at the SOM faculty seminar in Groningen 17 April 2014. We would like to thank the participants at this conference for their helpful comments and suggestions.

References

Andriopoulos, C., & Lewis, M. W. (2010). Managing innovation paradoxes: ambidexterity lessons from leading product design companies. *Long range planning*, 43(1), 104-122.

Arum, R., & Müller, W. (Eds.). (2009). *The reemergence of self-employment: a comparative study of self-employment dynamics and social inequality*. Princeton University Press.

Bessant, J., & Rush, H. (1995). Building bridges for innovation: the role of consultants in technology transfer. *Research policy*, 24(1), 97-114.

Born, A., & Witteloostuijn, A. (2013). Drivers of freelance career success. *Journal of Organizational Behavior*, 34(1), 24-46.

Burke, A. (2011). The Entrepreneurship Enabling Role of Freelancers: Theory with Evidence from the Construction Industry.

Burke, A. (2013). The Role of Freelancers for Business and Economic Performance. Presentation at SCALES Seminar, Rotterdam, the Netherlands, December 20.

Cappelli, P., & Keller, J. R. (2012). Classifying work in the new economy. *Academy of Management Review*.

Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of applied psychology*, 75(1), 51.

Handy, C. B. (1996). *Beyond certainty: The changing worlds of organizations*. Harvard Business Press.

Hagel, J., & Singer, M. (1999). Unbundling the corporation. *Harvard business review*, 77, 133-144.

Hothorn, T., Hornik, K., & Zeileis, A. (2006). Unbiased Recursive Partitioning: A Conditional Inference Framework. *Journal of Computational and Graphical Statistics*, 15(3), 651--674.

Kitching, J., & Smallbone, D. (2012). Are freelancers a neglected form of small business? *Journal of Small Business and Enterprise Development*, 19(1), 74-91.

Langlois, R. N. (1998). Personal capitalism as charismatic authority: the organizational economics of a Weberian concept. *Industrial and Corporate Change*, 7, 195-214.

Langlois, R. N. (2003). The vanishing hand: the changing dynamics of industrial capitalism. *Industrial and corporate change*, 12(2), 351-385.

Osnowitz, D. (2010). *Freelancing expertise: Contract professionals in the new economy*. Cornell University Press.

Wallace, M. (1998). Downsizing the American dream: Work and family at century's end. *Challenges for work and family in the twenty-first century*, 23-47.

Zinbarg, R.E., Revelle, W., Yovel, I., & Li, W. (2005). Cronbach's Alpha, Revelle's Beta, McDonald's Omega: Their relations with each and two alternative conceptualizations of reliability. *Psychometrika*, 70, 123-133. <http://personality-project.org/revelle/publications/zinbarg.revelle.pmet.05.pdf>

Figures & Tables

Table 1 Determinants and consequences of changes in worker roles associated with freelancing.

| Changes in environment | Adjustment of organization | Emergence of new worker roles | Impacts on society |
|---|--|---|--|
| Vanishing hand (Langlois, 2003) | Unbundling (Hagel & Singer, 1999) | Independent contracting (Kalleberg, 2000) | Isolation of individuals (Castel, 2009) |
| Economic crisis (Boutillier & Uzunidis, 1995) | Down-sizing (Wallace, 1998) | Temporary workers (Bureau of Labor Statistics) | Disintegration of system (Robert & Castel 2009) |
| Legal constraints (Jont-Lambert, 1994) | Portage | Self-employment (Romero & Martinez-Roman, 2012) | Displace regular workers (Faulkner, 1983; Barley & Kunda, 2004; Stanworth & Stanworth, 1997) |
| Knowledge Economy (Foray) | Shamrock organizations (Born & Witteloostuijn (2013) | Portfolio workers (Handy 1984) | Creative cities Cost reduction (Süß and Kleinerk, 2010) |
| | Project-based Firms (Whitley) | Knowledge workers (Carter 1994) Freelancers (Kitchings and Smallbone, 2012; Lukes, 2013; Mould <i>et al.</i> , 2013) | |
| Generation X Digital Natives | | | |

Table 2 Identification of freelancers in SINE based on the dimensions proposed by Kitching and Smallbone (2012).

| ID | Dimension | Original filter | Criterion identified | Indicator |
|----|-----------------------|---|---|-------------------------|
| A | Work status | Self-employed proprietors and partners in unincorporated businesses, and directors of limited companies, without employees genuinely in business on their own account, including some PAYE umbrella company employees | No salaried employees except for the director at start-up | SAL < 1 |
| B | Skill / occupation | Creative, managerial, professional, scientific and technical occupations only | Obtained higher education in sciences, arts, social sciences, or management | FILDIPSA ∈ {3, 5, 6, 7} |
| C | Nature of client base | Organisational and personal clients | No personal clients in 2002 | ZTYPCLIA ≠ 3 |
| D | Number of | Workers with only a single client | More than one client in | NBCLIA ≠ 1; |

| | | | | |
|---|---------------------------------------|--|--|-----------------|
| E | clients included Contract duration | included Contracts of any duration included | 2002 Experienced important modifications in client base between 2002 and 2005 | ZMODB = 1; |
| F | Primary / secondary work role | Workers working freelance in either primary or secondary paid work roles, on either a full-time or part-time basis | Does not indicate a side-activity in another firm | AUTACTA ∈ {0,3} |

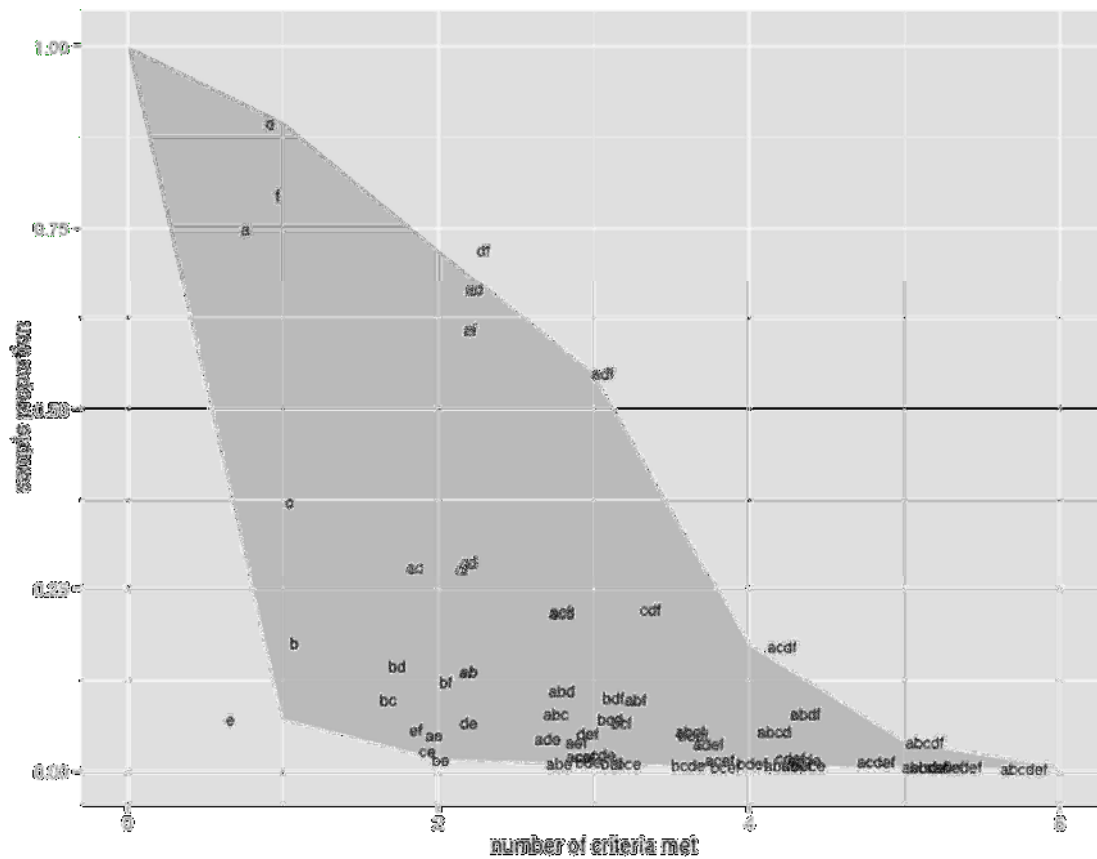


Figure 1 Proportion of freelancers among entrepreneurs launching or retaking a firm in France in 2002. Notes: Based on 92966 observations. The shaded area indicates the range of proportions encompassed by all combinations of criteria. Letters indicate which of criteria specified in table 1 are met. The position of the letters on the x-axis is approximate due to distortion introduced to improve readability. The combination “*ab*” in bold italic on the plot corresponds to the definition adopted by Kitching and Smallbone (2012).

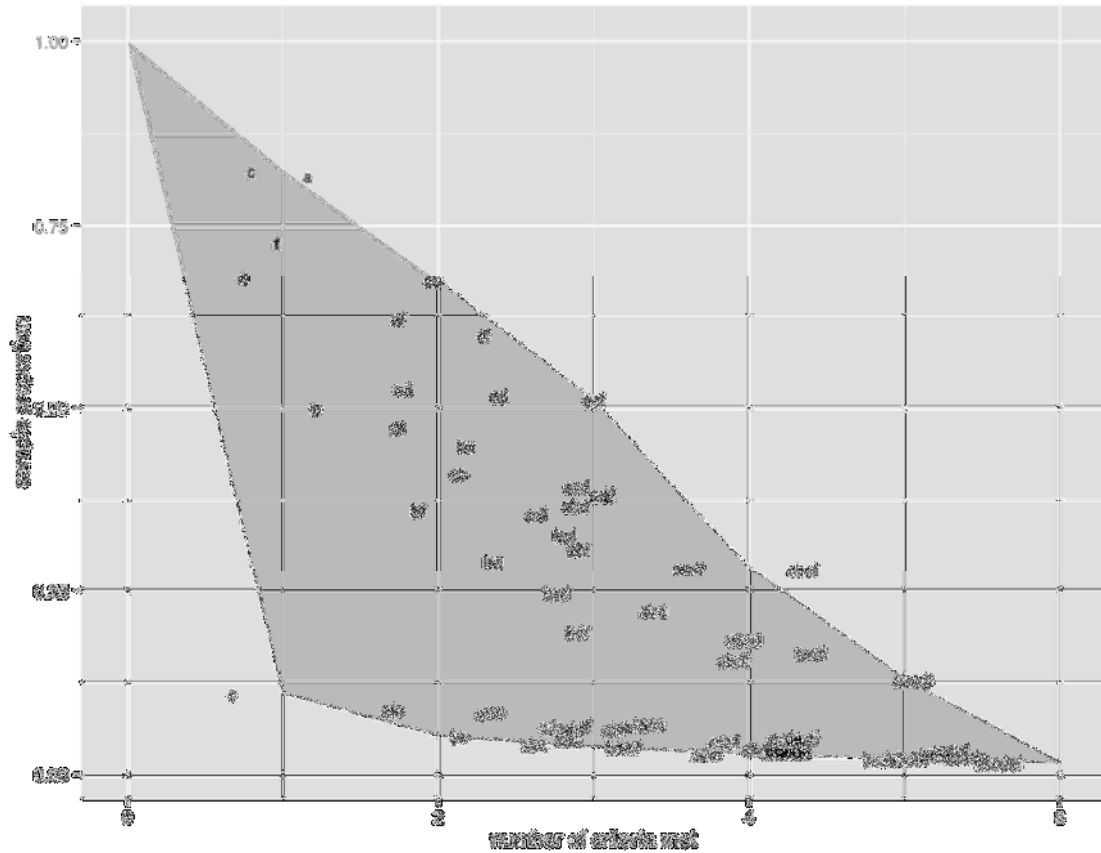


Figure 2 Proportion of freelancers among entrepreneurs in innovative sectors. Notes: Based on 1962 observations following INSEE classification of “innovative sector” adopted in SINE (INOV = 1). The shaded area encompasses the proportions corresponding to all combinations of the criteria specified in table 1. For most combinations the proportion of freelancers identified among firms in the innovative sector is higher than the corresponding proportion among firms of all sectors. The exceptions “ad” “df” “i” “ad” “d” are printed in bold. According to a chi-squared test of independence of factors the difference is significant with a confidence level of more than 99.9 % for all but three combinations (“adef”, “af” and “def”), which are printed in italic on the plot.

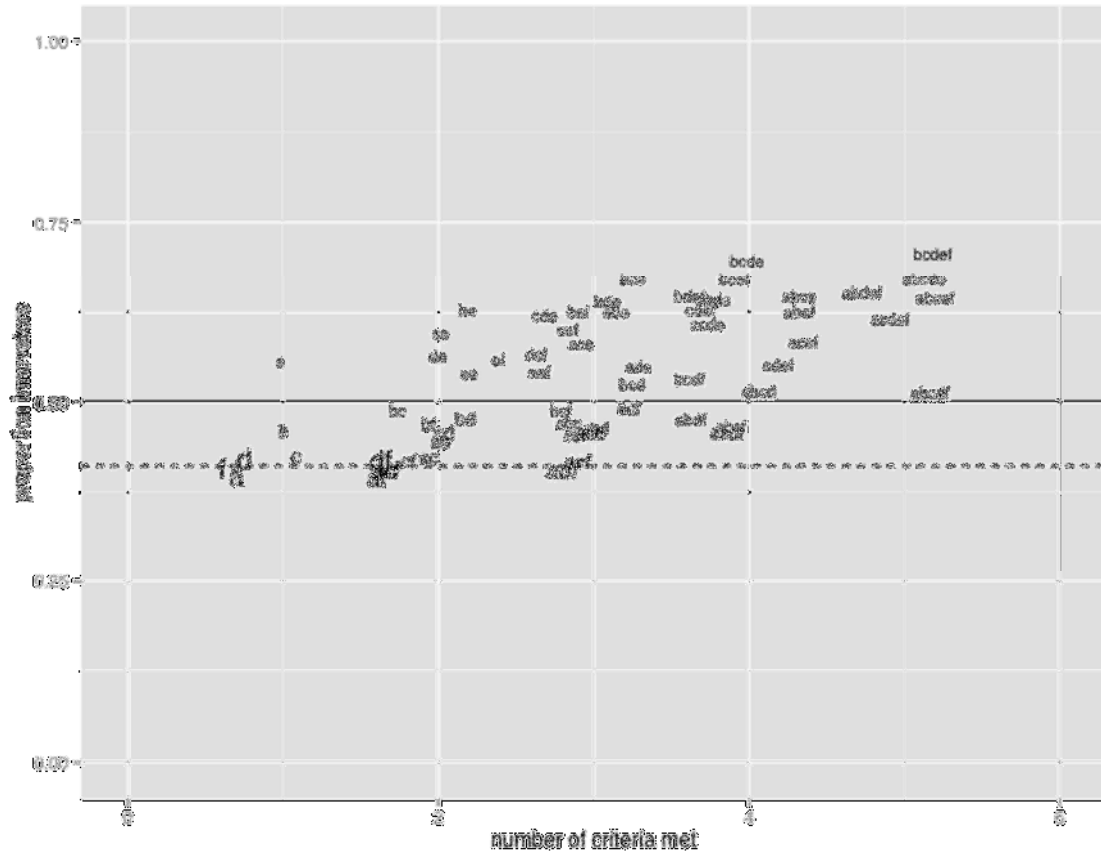


Figure 3 Proportion of respondents who declare they are engaged in innovation. Notes: Based on 89318 observations corresponding to all respondents indicating whether they were innovative in SINE (INOVA ≠ 0). The dotted line indicates the proportion of respondents who say they carry out innovative activities. The proportions of innovators among freelancers identified by specific combinations of table 1’s criteria met is indicated by the position of the corresponding labels on the plot. The size of these labels serves as a reminder of the differences among combinations in terms of the proportion of the population covered by them, as shown in detail in figure 1. According to a chi-squared test of independence of factors the proportion of respondents engaged in innovation differs significantly from others meeting the same combination of freelance criteria with a 99.9% confidence level for all but a few combinations printed in italic if p-values remain smaller than 0.01 and in bold italic if not.

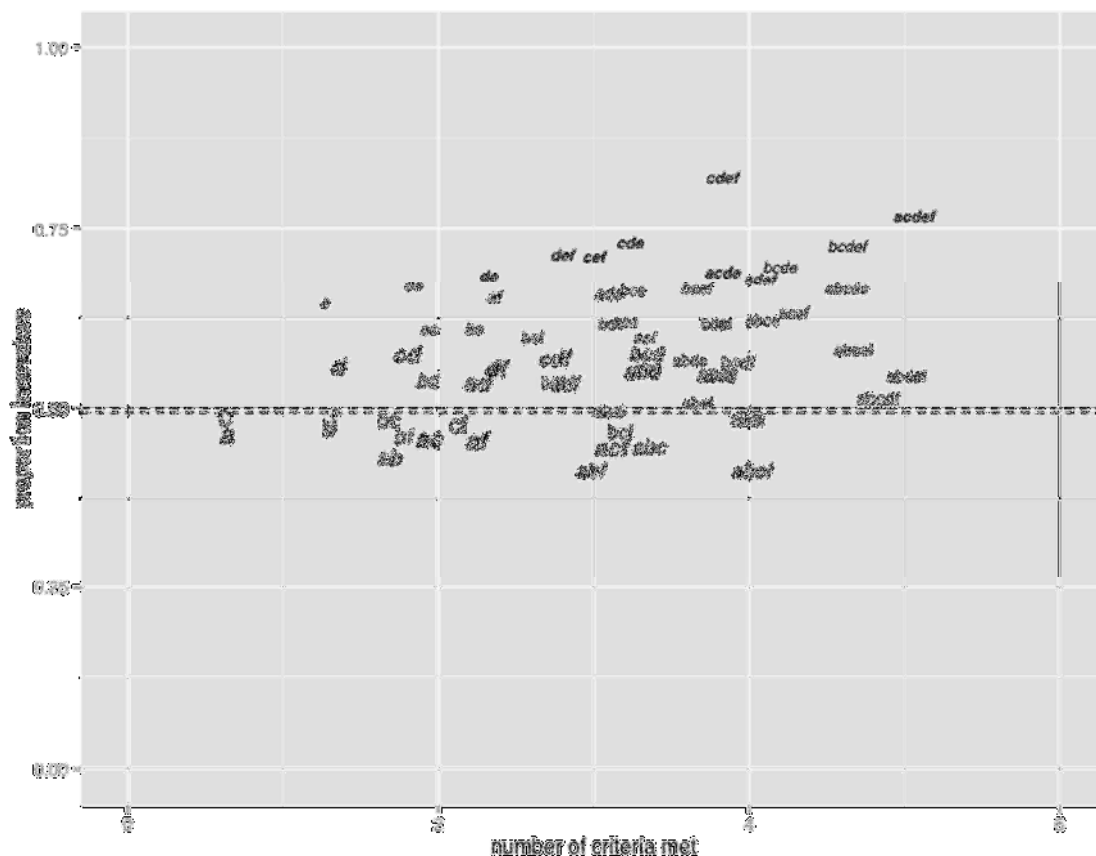


Figure 4 Proportion of respondents in innovative sectors who declare to be engaged in innovation. Notes: Based on 1928 observations consisting of answers given by respondents in innovative sectors who indicated whether they were engaged in innovation in SINE (INOV = 1 & INOVA ≠ 0). The position of the labels indicates the proportion of respondents for specific combinations of criteria and their size indicates the relative importance of combinations as shown in detail in figure 2. Combinations for which the difference between innovators and others is significant with a confidence level of more than 95% are printed in italic. Those for which the level of confidence exceeds 99.9% are printed in bold italics.

Table 3 Criteria used to assess to extent in which a respondent can be considered freelancer. The final column indicates the number of respondents in the 2002 SINE data that fulfill the criterion (total number of respondents in data: 89318).

| Label | Specification ² | Description | Respondents |
|-------------|----------------------------|---|-------------|
| Single | SAL < 1 | No salaried people at start of firm | 69631 |
| Egoist | OBJECTA = 1 | Principal objective is to ensure own employment | 45258 |
| Initiator | TYPCREA = 6 | The firm did not exist before | 71856 |
| Independent | FRANCHA = 0 or | No formal links with other firms exist | 86784 |

² See http://www.insee.fr/fr/themes/detail.asp?ref_id=ir-sine2007&page=irweb/sine2007/dd/doc/listvar.htm for the exact definition of each variable.

| | | | |
|---------------|-------------------------------|---|-------|
| | FRANCHA = 3 | | |
| Autarcic | not DIRIG4A = 4 | Not co-directed with associates | 81371 |
| Skilled | DIPLO6A = 6 | Graduate | 27271 |
| B2B | not ZTYPCLIA = 3 | Most important clients are not private individuals | 34539 |
| Devoted | AUTACTA = 0 or AUTACTA = 3 | No other side activity disclosed | 73898 |
| Multi-tasking | not NBCLIA = 1 | More than one or two clients or number of clients not disclosed | 83300 |
| Downstream | STEXEA = 1 | Essentially sub-contractor | 10464 |

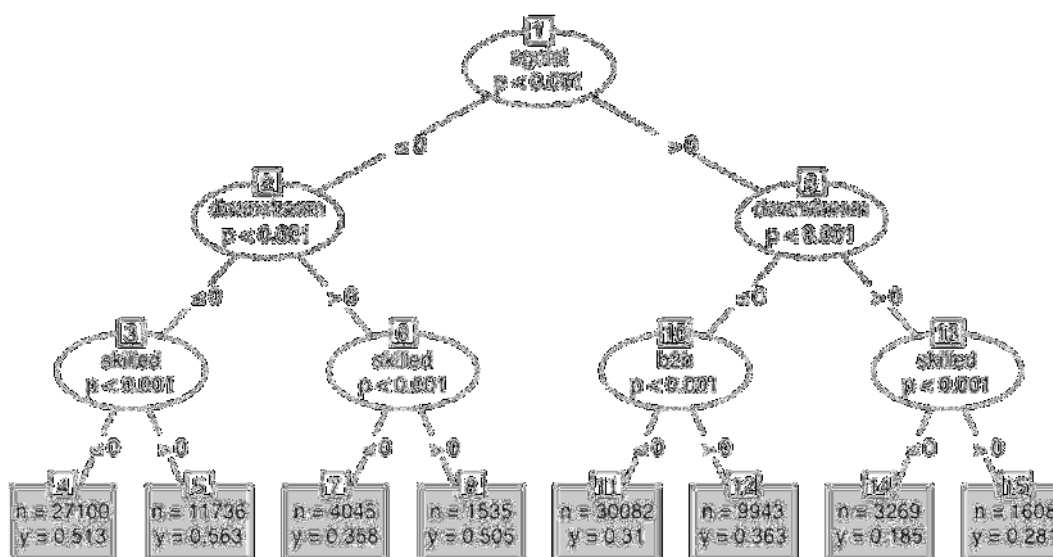


Figure 5 First three layers of a decision tree constructed through recursive partitioning using the criteria listed in table 1 to classify respondents according to their likelihood to innovate. For instance, there are 1608 respondents in the dataset with a graduate degree or more working as subcontractor with the prime aim to secure their own job (node 15). The likelihood that they think they are innovative is 28%.

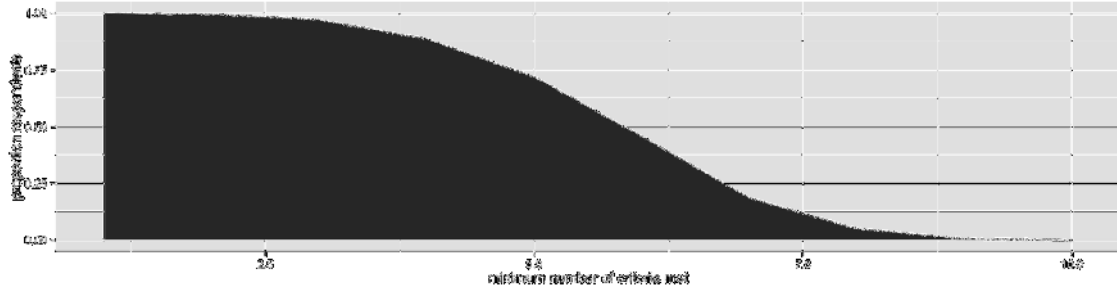


Figure 6 Proportion of respondents who meets a minimum number of criteria for freelance organization.

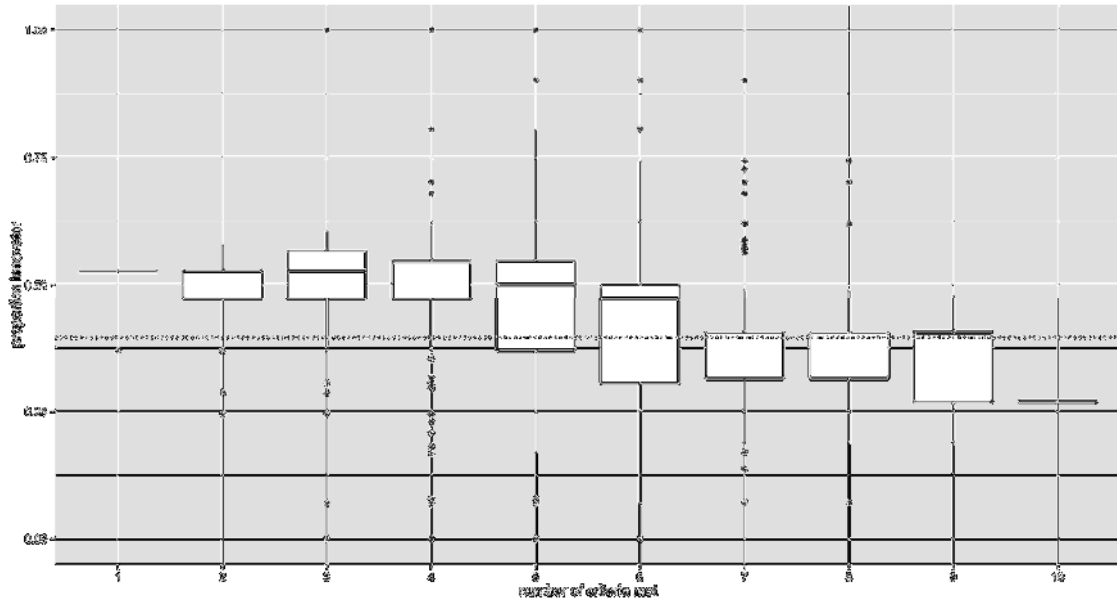


Figure 7 Distribution of likelihood that a respondent in a particular subset declares to be innovative for a given number of criteria met. The likelihood is determined on the basis of recursive partitioning on the innovation response using the same criteria. The horizontal dotted line indicates the overall probability that a respondent declares to be innovative.

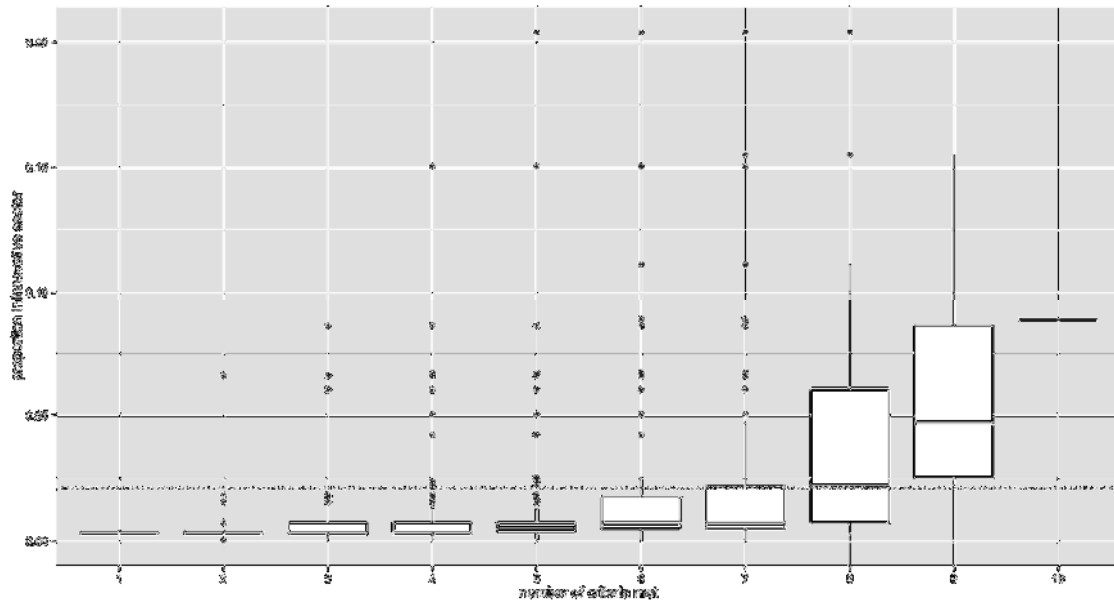


Figure 8 Organizational characteristics associated with freelancing are more prevalent in innovative sector.

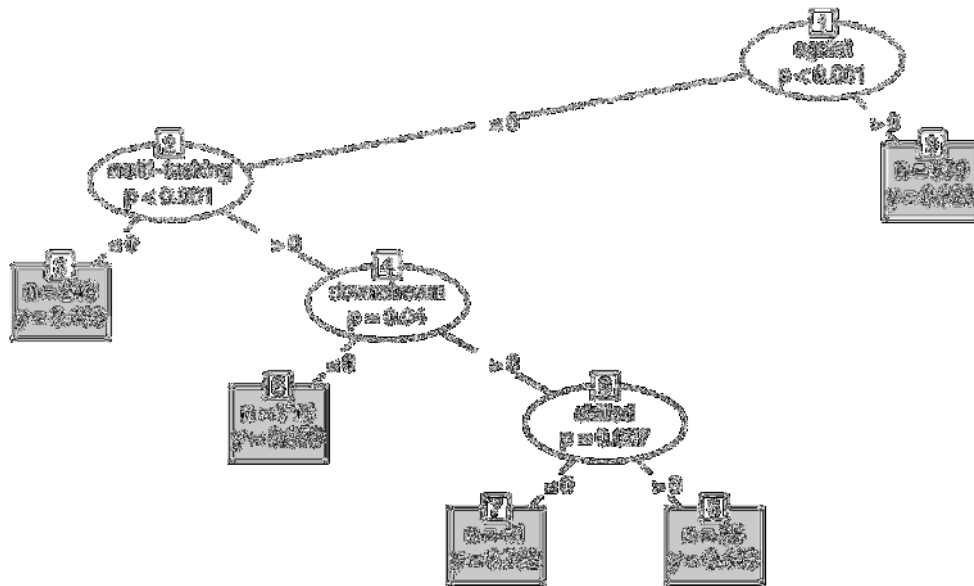


Figure 9 Decision tree obtained by recursive partitioning indicating the freelance criteria that are most predictive of innovative activity within the innovative sector.

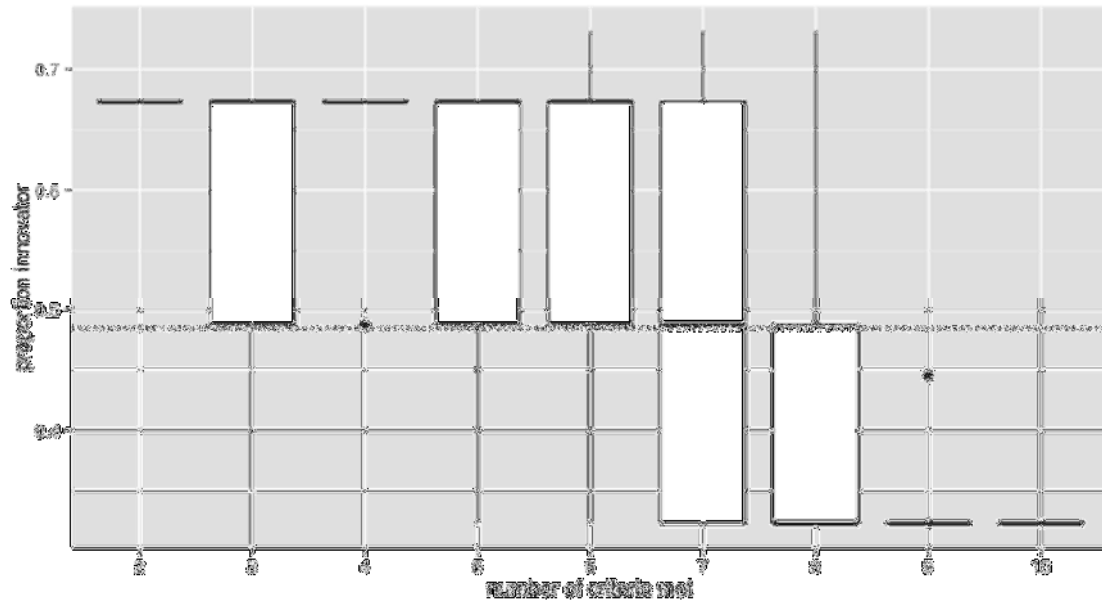


Figure 10 Proportion of respondents who meet a given number of criteria associated with freelance who also declare to be innovative within the innovative sector.