Informal Learning at Work and the Securing of Professional Mobility

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Abstract – In addition to job training, some work activities or organisational contexts may be more or less favourable to the development of skills through informal learning (IL). What is its influence on the probability of employment for workers in external mobility? This issue is addressed using data from the Céreq's *Dispositif d'enquête sur les formations et itinéraires des salariés* (DEFIS, a survey on employee training and career path). With respect to a basic model of human capital accumulation, some of the results are unexpected; in particular, workers who left jobs that were *a priori* the most favourable to IL (cognitive processes, autonomy and professional exchanges) appear to derive no benefit from it; the most favourable situations combine only cogntive processes and autonomy, without professional exchanges. One explanation would be that while the positions most conducive to IL contribute to the development of skills, professional exchanges include an employee evaluation dimension, the outcome of which is not always favourable. In this case, external mobility could correspond to a negative evaluation likely to undermine workers' self-confidence and their careers.

JEL classification: J2, J3, J6
Keywords: training, work activity, organisation, probability of employment

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In the context of a flexible labour market, training appears to be a key component in securing workers' career paths, in particular by promising to make it easier to return to work after external mobility (loss of job or resignation). In the French case, research has shown that on-the-job training helps to secure external mobility (Blasco *et al.*, 2012). The effect of training during a period of unemployment is less clear: it would not reduce the duration of unemployment (or only reduce it very little) but would increase the duration of subsequent employment (Crépon *et al.,* 2012). The training period would therefore have potential for securing career paths when it takes place before mobility. Having received training also has an impact on other dimensions, such as the level of pay or the quality of the job found (Aubert *et al.*, 2009), which help to make the career path more secure. Some authors note, however, that the benefits are largely reaped by the employer (Goux & Maurin, 2000; Lê, 2013). One possible interpretation is that the latter uses training above all as a lever for developing the specific human capital of its employees and invests in those it wishes to retain (Lainé, 2002). This would help to explain why access to on-the-job training is very uneven depending on age, level of initial training, occupational group or type of contract (Céreq, 2014). Training therefore does not necessarily appear to be a resource for those workers who, from a public policy perspective, appear to need it most: those in the secondary segment of the labour market defined by their overexposure to external mobility (Picart, 2017).

However, the acquisition of skills is not exclusively the result of formal training (as defined in labour law): other, more everyday forms of learning, such as hands-on learning, direct transmission of know-how or receiving instructions, also contribute to it. While the role of such 'informal' learning (IL) is now widely recognised in the development of skills (Fournier *et al.*, 2017a), few quantitative studies have attempted to measure its effects on career paths. This is what is proposed here by focusing on workers experiencing external mobility after resignation, contract termination or redundancy; the aim is to quantify the role of IL in securing the career paths of workers facing labour market selectivity.

One difficulty in this respect is that, unlike diplomas, formal training or certified achievements, informal learning is by nature difficult to objectify, posing a statistical problem of measurement and implying a certain theoretical indeterminacy as to its effects, as we shall see further on. To understand them, we rely here on a typology developed by Fournier *et al.* (2017b), which characterises work situations according to whether they are more or less conducive to IL. Drawing on the lessons of vocational didactics and on the basis of data from Céreq's *Dispositif d'enquête sur les formations et itinéraires des salariés* (DEFIS, a survey on employee training and career path), these authors propose the concept of work dynamics, which combines organisational contexts and job activity to describe the extent to which a work situation facilitates IL or not (see Appendix 1). A statistical classification leads them to distinguish groups of organisational contexts and work activities that are more or less favourable to IL (the variables used for the classification are detailed in Appendix 1, Table A1). This results in the distinction of three classes of organisational contexts: those that facilitate dialogue and the sharing of information, the transmission of skills, professional development, the decompartmentalisation of work, reflection on practice and value the collective are considered favourable, those that only combine the first three characteristics are considered partially favourable and those with none of them are considered unfavourable. In terms of work activities, four classes are distinguished: job conducive to IL facilitate cognitive processes, exchanges and autonomy, activities not conducive to IL facilitate none of these aspects, and two intermediate categories are also considered, one combining cognitive processes and exchanges, the other cognitive processes and autonomy. Finally, Fournier *et al.* (2017b) distinguish twelve working dynamics ranging, in terms of IL, from the most (conducive activity in an IL-friendly context) to the least (non-conducive activity in an IL-unfriendly context).

These categories are mobilised as they are, and the same DEFIS data are used here. The particularity of this investigation is to focus on external mobility.[1] The aim is to document the effect of having previously held a work position conducive to informal learning (IL) on the subsequent return to work of externally mobile workers. More precisely, we analyse the situation, between early 2014 and mid-2015, of employees under the age of 60 who were employed at the

1. The typology proposed by Fournier et al. *(2017b) is based on all employees (in a company with ten or more employees), whether or not they left their job of end 2013; it is therefore little influenced by the case of externally mobile workers, who represent less than 20% of all the workers surveyed.*

end of 2013 in a company with ten or more employees and who left their job following a resignation, contract termination or redundancy (retirements are excluded from the scope of the analysis), depending on whether they were in an organisational context that was more or less favourable and in an activity that was more or less conducive to IL at the end of 2013. This focus on externally mobile workers responds to the specificities of the issue of job security in France, where access to continuous full-time employment (primary segment) often involves repeated confrontation with the selectivity of the labour market.[2]

The rest of the article is organised as follows: The first section presents the literature on the role of IL in business and its possible influence on the security of professional mobility. The second section presents the data, the study sample and first descriptive results. The third section is devoted to the econometric analysis of the short and medium term effects of the passage through a more or less favourable work dynamic for a representative sample of workers who experienced external mobility between the beginning of 2014 and mid-2015. This section first presents the results of a quasi-saturated regression analysis and produces a series of apparent and sometimes unexpected effects; it then examines more specifically the effect of taking into account the circumstances of external mobility, on the one hand, and stages of training or certification of skills following the initial employment on the other. Finally, an analysis using instrumental variables is proposed to assess the risk of endogeneity of assignment to the various IL situations. The analysis concludes with an overall interpretation of how the different work situations distinguished by Fournier *et al.* (2017b) influence the access to employment of workers in external mobility.

1. Informal Learning, a Possible Factor in Securing Career Paths?

The concept of informal learning (IL) is broad, ranging from the acquisition of skills through practice (in an occupational or non-occupational setting) to skills acquired on the job through observation of other workers, receiving instructions, supervision or feedback from a boss or co-worker (see OECD, 2010, pp. 24–29). This is a form of skill development distinct from training where workers suspend their production activity, for a defined period and under defined conditions, to take on the role of learner, typically in a dedicated room.

1.1. Informal Learning and Skill Development

From Adam Smith's pin factory to the learning by doing of endogenous growth theories, the concept is present, albeit often implicitly, in the economic literature where IL basically has the status of a positive externality. The empirical study of the influence of IL at individual level, however, is poorly developed. Heckman *et al.* (2002) investigate the implications of the fact that, unlike training actions, IL does not suspend production activity and therefore appears to intervene without cost to the employer. De Grip (2015) insists on the scope of the hypothesis: insofar as the time spent learning on the job is much greater than that spent in training actions, IL would be, in his view, preponderant in the development of skills.

Little is known about the transferability of skills acquired through IL or their contribution to satisfactory occupational mobility. The empirical literature on the payoffs of experience or seniority is of little use because it does not take into account the fact that different jobs have very different potentials for IL. However, work situations involving IL are likely to contribute more than others to equipping the worker for the demands of the labour market. Arellano-Bover & Saltiel (2021) make a decisive contribution in this respect by showing empirically that the beneficial effect on wages stemming from experience are strongest in companies that are particularly favourable to IL.

From a more psychological perspective, IL can stimulate a sense of competence and provide the worker with self-confidence to facilitate access to employment. Van der Heijden *et al.* (2009) propose in this perspective a study of the comparative influence of formal and informal learning on the perception that workers have of their employability (quality of expertise, anticipation and efficiency, adaptability, sense of community, management of constraints). They find some statistical independence between markers of formal or informal learning and conversely very clear associations between the different circumstances favourable to IL. A regression analysis documents the determining factors for access to the different IL-favourable situations, including gender, age, education level, marital status, job seniority and workload. Statistically significant linkages are rare. The analysis consisting of regressing each of the five employability

2. According to Picart (2017), among people employed for at least one week in 2012 (just over 32 million people), 21% belonged to the secondary segment, i.e. faced constraints related to how the labour market works (unemployment or underemployment).

dimensions considered on the characteristics of the worker, those of the organisational context and the various learning opportunities (including formal learning) leads mainly to the following conclusions: formal learning of the job-specific adaptation type is positively associated with most of the employability dimensions; the presence of interactions with superiors only shows a significant association with the sense of community and the management of constraints; the learning content of the job does not show a statistically significant link with any employability dimension except with the feeling of expertise, and this link is paradoxically negative, all things being equal.

One reason to be interested in IL is the hope that it is a less discriminating method of skills development than training. Ferreira *et al.* (2018) are specifically interested, in the differences in IL involvement between employees on temporary contracts (secondary segment) and others. Based on OECD data, they observe, all things being equal, a more intense involvement on the part of the former. The interpretation favoured by Ferreira *et al.* (2018) is that these secondary segment employees would see IL as an investment in accessing stable employment.

1.2. Informal Learning and Occupational Mobility

There are several theoretical reflections that address the way in which IL can influence career paths in the job market. Rosen (1972) proposes a job market model in which the various positions have varied learning potential. In contrast to the idea of IL as an externality, the market becomes dual: both work and learning opportunities are traded. This framework provides the basis for a theory of occupational mobility in which a worker can accept a low-paid job at the beginning of their working life, provided it is conducive to learning, in the hope of moving on to higher-paid jobs. Sicherman & Galor (1990) develop a similar argument for understanding patterns of internal (no change of employer) or external occupational mobility; in analysing these patterns they emphasise the opposition between (company) specific and general knowledge. Their highly Beckerian assumption is that the knowledge acquired informally is often specific and therefore more useful in the context of internal rather than external mobility. In such a model, therefore, there would be little to expect from IL-friendly work situations with regard to the future of externally mobile workers. Nevertheless, Acemoglu & Pischke (1999) contest the practical significance of the distinction between specific and general knowledge: empirical analysis suggests that they are complementary in the development of skills.

Perhaps a more serious impediment to the valuing of IL in the case of external mobility is the informational imperfection inherent in the labour market. De Grip (2015) notes that skills acquired informally are likely to be less visible to potential employers than those resulting from a training action. This risk justifies the existence of public policy schemes explicitly designed to certify skills acquired on the job, such as the VAE (*Valorisation des acquis de l'expérience*, accreditation of prior experiential learning – APEL) in France; competence should be accompanied by signals to reduce exposure to unemployment (cf. Spence, 1973). Yet, analysing wage progression, Arellano-Bover & Saltiel (2021) find clear evidence of the transferability of skills acquired informally for Italy and Brazil.

2. Data, Study Sample and Initial Descriptive Approach

The Céreq's DEFIS data on which we rely combines a survey of a sample of companies (employer section) with a panel of employees (employee section) monitored over five years (2015-2019). The sample of companies includes 3,400 companies with at least ten employees, which are representative for the private sector (excluding agriculture). The employees surveyed are those employed in the sample companies at the end of 2013. The employer section describes the context in which these individuals were working at the end of 2013: characteristics of the company, work organisation, human resources management, continuing vocational training, manager's profile. The employee section is aimed at documenting workers' trajectory: individual characteristics, training wishes, constraints and needs, on the job learning, relations within the company, information circulating on training opportunities, jobs and professional changes, training undergone and past trajectory.

Of the 15,000 or so people who were employed in one of the companies with at least ten employees surveyed at the end of 2013,[3] some 3,200 had left their initial employer by 2015. Here, we are interested in the prospects of these workers in external mobility. In 2015, 49% were employed (salaried or self-employed), 27% were unemployed and 13% were retired or in early

3. Sample representing approximately 12 million non-agricultural private sector employees at the end of 2013.

retirement. The latter, as well as employees over the age of 59, are excluded from the analysis. In 2016, a considerable proportion of the sample of externally mobile workers could not be re-interviewed: about 2,000 individuals remained, with the shares of actively employed, unemployed and (pre-)retired workers stood at 55%, 20% and 16% respectively.

2.1. Workers in External Occupational Mobility

In order to analyse the effect of work situations that are more or less favourable to IL in terms of the becoming of a working-age population, we have chosen to exclude individuals who were retired or aged over 59 in 2015. This is a compromise to ensure that a reasonable number of observations are kept, while avoiding the labour market participation issues specific to workers approaching retirement age. This brings the study sample down to 2,761 non-retired mobile individuals representing just over 2.3 million individuals in 2015 and 1,646 observations representing 2.1 million individuals in 2016 (Table 1).

How were these externally mobile workers distributed between the different work situation identified by Fournier *et al.* (2017b)? Table 2 answers this question and compares the distribution of the study sample with that of all employees. At the end of 2013, workers on the verge of external mobility were less often in a context favourable to IL and their activity was itself less often conducive to IL. When the

Table 1 – **Labour market situation of individuals under 60 in 2015 who were no longer employed by their end-2013 employer (%)**

	2015		2016	
	Unweighted	Weighted	Unweighted	Weighted
Employment	56	54	65	65
Unemployment	32	34	24	28
Study/training	8	7	6	4
Other inactivity	4	5	5	3
Total	100	100	100	100
Number	2,761	2.3 million	1,646	2.1 million

Notes: The weighting applied for 2016 corrects for attrition.
Reading Note: At the time of the first survey wave in 2015, 54% of workers who had left their employer of end- 2013 were employed.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

Table 2 – **Distribution by work dynamics in 2013: all employees surveyed (north-west values)/ externally mobile workers under 60 in 2015 and 2016 (south-east values); weighted data**

Organisational context	Job Activity…				Total
	Conducive to IL	Partially conducive		Not conducive	
		Exchanges without autonomy	Autonomy without exchanges		
Favourable to IL	9	11	12	7	39
2015	4	12	8	8	33
2016	3	13	8	8	32
Partially favourable	6	11	11	17	45
2015	4	15	7	23	49
2016	3	11	8	25	47
Unfavourable	2	2	4	8	16
2015	1	3	3	11	18
2016	1	4	3	13	21
Total	17	24	27	32	
2015	9	30	19	42	100
2016	8	28	19	45	

Notes: The analysis of the differences in distribution between all the employees surveyed on the one hand and the sub-samples of mobile workers on the other involves two-sided tests of homogeneity on the unweighted distributions; the differences are all significant (at the 5% level) except those measured for the following context x activity configurations: favourable x exchanges without autonomy, favourable x non-conducive, unfavourable x conducive. The weighting applied for 2016 corrects for attrition. As for unweighted data, the difference obtained for the partially favourable x exchanges without autonomy configuration is only significant at the 10% level.
Reading Note: 9% of employees had a work activity that was conducive to informal learning within a context that was itself favourable; this was the case for only 4% of the externally mobile workers surveyed in 2015 (*N*=2,761) and 3% of the externally mobile workers surveyed in 2016 (*N*=1,646).
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

activity was only partially conducive, it was more often because of lack of autonomy than because of lack of exchanges. In greater detail, the clearest differences concern: *(a)* activity not conducive to IL in a partially favourable context (in 2015: 23% of external mobility cases compared to 17% for all employees); *(b)* partly conducive activity due to lack of autonomy in a partly favourable context (in 2015: 15% of external mobility cases compared to 11% of all employees, Table 2).

2.2. Employment Rates in the Short and Medium Term

For externally mobile workers, did the work situations most favourable to IL lead to better employment opportunities later on? This is not what Tables 3 and 4 suggest. These describe the fate of the study sample in mid-2015 and mid-2016 in terms of employment rate according to the work dynamics (see Appendix 1) at the end of 2013.

In the short term (mid-2015), workers enjoying the employment rate of those in the most favourable work context and activity is not significantly different from the average. The lowest employment rate (28%) was indeed for groups in unfavourable organisational contexts, but their activity was partially conducive to IL. Conversely, workers facing the least favourable dynamics at the end of 2013 fared significantly better (at the 5% threshold) than the average, with an employment rate that was 8 points higher (62%, see Table 3). Only workers with autonomy in an organisationnal context only partially favourable to IL did better.

Table 3 – **Short term employment rate (mid-2015) among externally mobile workers under 60, by work dynamics at the end of 2013; weighted data**

Organisational context		Job Activity…				Total
		Conducive to IL	Partially conducive		Not conducive	
			Exchanges without autonomy	Autonomy without exchanges		
Favourable	Employment rate (%)	51	40	60	54	50
	(N)	*(127)*	*(301)*	*(254)*	*(251)*	*(933)*
Partially favourable	Employment rate (%)	69	55	65	53	57
	(N)	*(120)*	*(344)*	*(235)*	*(610)*	*(1,309)*
Unfavourable	Employment rate (%)	42	28	57	62	54
	(N)	*(47)*	*(84)*	*(105)*	*(283)*	*(519)*
Total	Employment rate (%)	58	46	61	56	54
	(N)	*(294)*	*(729)*	*(594)*	*(1,144)*	*(2,761)*

Reading Note: 54% of non-retired individuals under 60 who, in 2015, are no longer employed by their December 2013 employer are in employment in 2015 this applies to 51% of those who, in December 2013, were in an activity conducive to informal learning in a context that was favourable to such learning. Homogeneity tests were performed to compare the employment rate of each work dynamic to the overall employment rate.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

Table 4 – **Medium term employment rate (mid-2016) among externally mobile workers under 60, by work dynamics at the end of 2013; weighted data**

Organisational context		Job Activity				Total
		Conducive to IL	Partially conducive		Not conducive	
			Exchanges without autonomy	Autonomy without exchanges		
Favourable	Employment rate (%)	65	68	70	52	65
	(N)	*(91)*	*(176)*	*(164)*	*(133)*	*(564)*
Partially favourable	Employment rate (%)	42	76	81	56	64
	(N)	*(62)*	*(193)*	*(154)*	*(361)*	*(770)*
Unfavourable	Employment rate (%)	31	75	76	64	66
	(N)	*(30)*	*(55)*	*(71)*	*(156)*	*(312)*
Total	Employment rate (%)	50	72	75	58	65
	(N)	*(183)*	*(424)*	*(389)*	*(650)*	*(1,646)*

Reading Note: 65% of workers who, in 2015, were no longer employed by their December 2013 employer were employed in 2016; this applies to 65% of those who, in December 2013, were employed in an activity conducive to informal learning in a context that was favourable to informal learning.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

Table 4 describes the medium-term (mid-2016) situation. The first finding that helps to qualify the short-term impression is that a job activity not conducive to IL no longer appears to be associated with particularly high employment rates, whether or not the organisational context is favourable to IL. However, the lowest employment rates are still associated with IL-conducive activities: only 50% compared to 65% overall. This is mainly due to less IL-friendly contexts (employment rates of 42% or even 31%, Table 4). When broken down by work situation more or less conducive to IL, the highest employment rate (81%) is obtained for individuals who were engaged in an activity offering autonomy but lacking exchanges, and this in a context only partially favourable to IL. In a given context, partially IL-conducive activities are always associated with higher employment rates; among them, autonomous activities are associated with the highest employment rates. Work dynamics that seemed promising in terms of short-term employment (conducive activity in a partially favourable context, cf. Table 3) are associated in the medium term with the lowest employment rates (42%). Conversely, work activities with professional exchange but little autonomy associated with low employment rates in the short term appear among the most advantageous in the medium term (72%).

Thus, whether in the short or medium term, there is no simple association between work dynamics and the securing of external mobility: the most promising situations in terms of IL do not seem to provide any particular advantage, and sometimes they even seem to represent a handicap. This paradoxical result may, however, reflect strong compositional effects involving the usual determinants of individual employment probabilities. This is what we are now trying to clarify.

3. Econometric Analysis

The analysis consists in comparing the access to employment of individuals assigned to an IL-friendly work situation with that of other workers.This comparison would be unbiased if the assignment to IL-friendly positions was independent of the *ex ante* employment probability. This assumption is obviously doubtful: certain factors facilitating access to employment are probably involved in the assignment to an IL-friendly position as well. Workers participating in the tightest labour markets and/or presenting *ex ante* the least assets in the face of the selectivity of these markets may be over-represented in the best work dynamics: if access to formal training is selective precisely on the basis of criteria facilitating access to employment, perhaps the best work dynamics are, on the contrary, counter-selective. Assignment of these work dynamics could, for example, especially concern workers whom their employer considers needing to be tested. This would explain the previous paradox.

Another element that could bias the comparison is the focus on externally mobile workers. Being externally mobile is likely to have a different meaning depending on whether one is leaving a more or less IL-friendly position. For example, workers in positions that are not IL-friendly may be more likely to be searching for another job: this would determine both a greater propensity for external mobility and, where the case occurs, a faster return to employment. The bias is due to the fact that we are comparing workers with no job-seeking activity because they are assigned to a work situation that is IL-friendly with workers assigned to a position that is not IL-friendly and who are seeking another job.

In order to clarify the meaning of the descriptive results (cf. Tables 3 and 4), it is therefore first necessary to neutralise these potential composition effects. These can be identified by observed characteristics: it is therefore possible to neutralise these differences in characteristics that are known to be discriminating on the labour market; this is what is now being done using a regression analysis based on a quasi-saturated linear probability model (see Box and Online Appendix C1 – link at the end of the article).

This approach has two main advantages: it is non-parametric and the estimated coefficients are directly interpretable. It also allows for transparent consideration of sampling weights so that the proposed estimates are representative for the population of workers considered by the DEFIS data.

3.1. Apparent Effect of Work Dynamics for Externally Mobile Workers

What happens when effects of diploma-age-gender composition effects are neutralised? In terms of probability of employment and compared to the baseline, the least favourable situation for IL (non-conducive activity in an unfavourable context) does not result in any statistically significant disadvantage (Figure I; the results of the estimations are detailed in Tables A3-1 and A3-2 in Appendix 3). At the other end, whether in the short or medium term,

Box – **A quasi-saturated linear probability model**

The estimated equations are in the form:

$y_i^{2013+t} = \sum_{j=1}^{12} \rho_j \nu\left(sit_i^{2013} = j\right) + \sum_{k=1}^{6}\sum_{l=1}^{5}\sum_{m=1}^{2} \beta_{klm} \nu\left(dip_i = k\right) \nu\left(age_i = l\right) \nu\left(sex_i = m\right) + \varepsilon_i$, where:

y_i^{2013+t} the activity status of the individual i in $2013+t, t \in \{2;3\}$;

$\nu\left(sit_i^{2013} = j\right)$ an indicator that their working dynamics at the end of 2013 were of the type $j \in \{1,\ldots,12\}$.

The conditioning variables include the diploma (dip, with six possible values: no diploma or BEPC, CAP-BEP, baccalaureate, baccalaureate+2, baccalaureate+3/+4, baccalaureate+5/*Grandes écoles*), gender and age (with five possible values: under 25, 25-29, 30-39, 40-49, 50-59).

The differences are measured in relation to a baseline situation corresponding to the case of an externally mobile worker who, in 2013, had a job that was not conducive to IL in an organisational context that was partially favourable. These differences are calculated over two time horizons: the short term (activity status mid-2015) and the medium term (activity status mid-2016).

The models are estimated using weighted data. Although the differences in baseline probability between weighted and unweighted data indicate some under-sampling of individuals with a low risk of non-employment, the results obtained are qualitatively consistent (see Table A3-2 in Appendix 3).

Note that this quasi-saturated regression analysis is similar to propensity score matching (this point is highlighted in Online Appendix C1).

the best work dynamics (activity conducive to IL in a favourable context) brings no statistically significant advantage. For IL-conducive activities, the organisational context seems to make a difference. The absence of overlapping between the confidence intervals (see Figure I) shows that these differences are significant – this direct comparison amounts to a test of equality between estimated coefficients.

Contrary to what might be expected, although some of the estimates are imprecise, working in an IL-conducive job in an unfavourable IL context reduces the probability of employment: −18 percentage points in the short term (see Table A3-1) and −30 percentage points in the medium term (see Table A3-2). A work activity that is not IL-conducive in a context that is at least partly IL-friendly is better than an IL-friendly activity in an unfavourable context. The only case of an activity conducive to IL that provides a significant advantage for the external mobility worker corresponds, in the short-term, to contexts that are only partly IL-friendly; however, the benefit is not stable in the medium term (see Figure I).

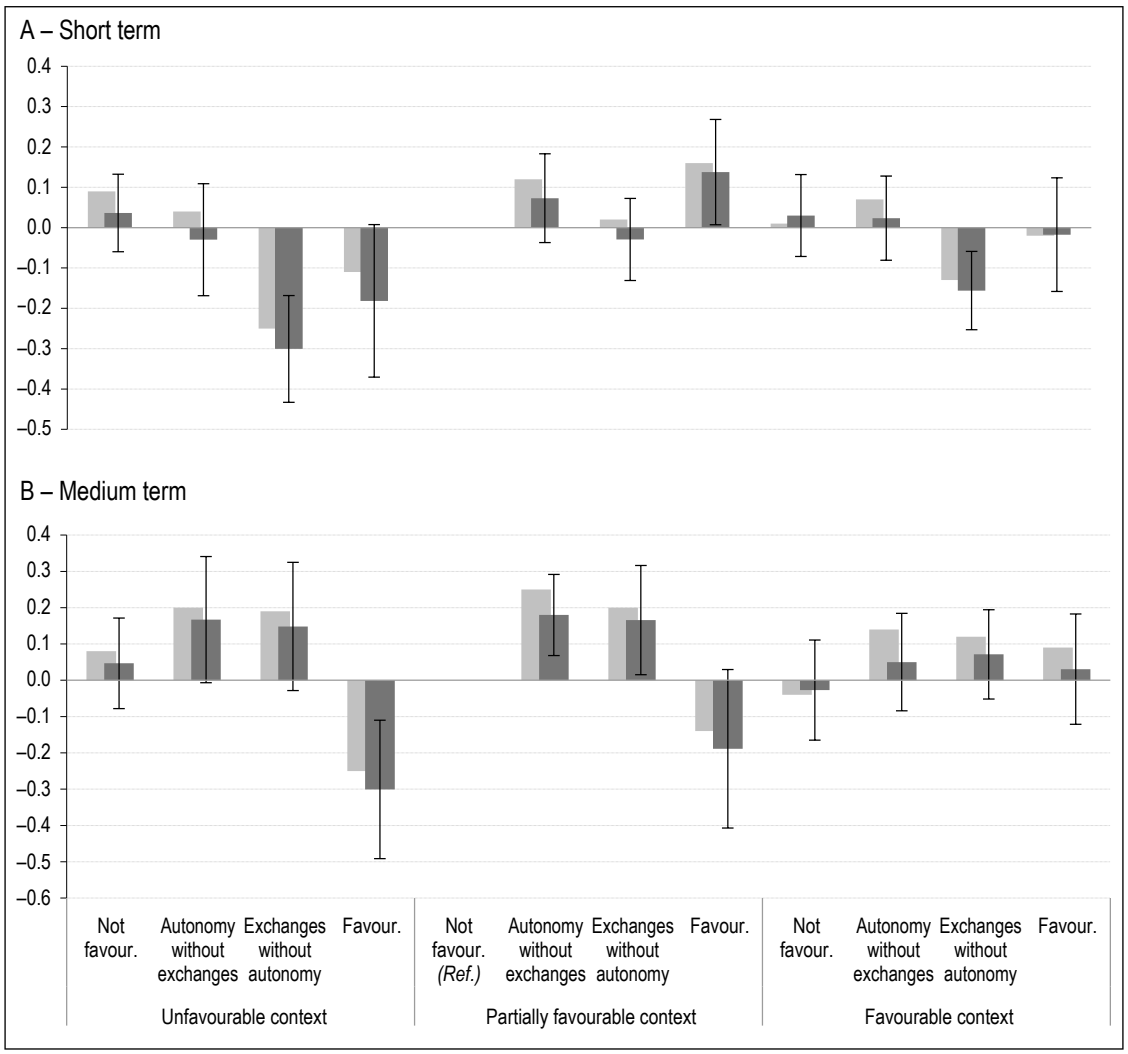
In the short term, the apparent effect of activities that are partially conducive to IL (autonomy without exchanges or exchanges without autonomy) is mixed (see Figure I and Table A3-1 in Appendix 3): situations of exchanges without autonomy may involve a very marked handicap (in a context that is favourable or unfavourable to IL), which is not the case for situations of autonomy without exchanges. In the medium term, however, the probability of employment is much higher in both cases (although imprecisely measured, see Figure I and Table A3-2).

Taking into account the chosen (rather than endured) character of mobility brings a first perspective[4] on the previous results. For a given combination of conditioning variables, workers leaving an activity conducive to IL in a context that is only partially favourable are much more likely than the baseline to initiate their mobility (see Table A3-1). In the short term, this mobility is indeed accompanied by an exceptionally high and often full-time employment probability for an IL-friendly activity (see Table A3-2).

Considering other outcomes (full-time employment, permanent employment, unemployment) provides useful supplements to the analysis (see Tables A3-1 and A3-2). In particular, the lesser probability of access to employment frequently associated with IL-conducive activities does not seem to be offset by better quality of employment (full-time or permanent); the two aspects tend to go hand in hand. In the short term, for example, the lower probability of employment from situations combining cognitive processes and exchanges without autonomy in unfavourable contexts is coupled with a significantly lower probability of full-time employment and especially of permanent employment.

4. *We will come back to this point later.*

Figure I – **Apparent effect on the probability of employment of work situations more or less favourable to informal learning. Quasi-saturated linear probability model, OLS estimates on weighted data***



* Gross differences are reprensented in light grey.
Notes: Confidence intervals at the 90% level, robust (heteroscedasticity). The weighting applied for 2016 corrects for attrition.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

Overall, even if statistical significance is not always achieved, situations of autonomy without exchanges appear to be associated with the most satisfactory results: mobility more often chosen from organisational contexts that are partially favourable to IL, better probabilities of employment (both in the short and medium term), sometimes of better quality.

Compared to the baseline (activity not conducive to IL in a partially favourable context), the positive (respectively, negative) gross differences in employment rate overestimate (resp. underestimate) the apparent positive (resp. negative) effect of the work situations concerned. This means that a selection on observable variables takes place, implying an over-representation of diploma-age-gender characteristics favourable to access to employment in situations other than the baseline. The selection effect on observable variables appears particularly strong in situations of autonomy without exchanges: in the short and medium term, in a context favourable to IL, more than half of the employment rate advantage associated with these situations is that they relate to individuals with diploma-age-gender characteristics that in themselves are favourable to access to employment. Considering the case of IL-conducive activities helps to answer the question of their possible counter-selectivity. Compared to the baseline, there is an over-representation of individual characteristics favourable to employment. The initial paradox is therefore not removed.

One hypothesis is that IL is difficult to value in the labour market because it is not "visible" to employers, as opposed to formal training or

skills certification. It is therefore interesting to consider the relationship between work dynamics and possible training or certification steps, which may have taken place between early 2014 and mid-2015, after the departure from the initial company. Table A3-1 in Appendix shows that, for a given combination of conditioning variables, working in an activity conducive to IL is associated with a more frequent passage through "transitional" training[5] than the baseline: the effect is very strong in an unfavourable context, less so as it becomes more favourable.[6] The training undertaken between early 2014 and mid-2015 therefore appears to have no added value in terms of access to employment. In an organisational context partially favourable to IL, situations of exchange without autonomy are also associated with a significantly more frequent passage through transitional training, but this time it seems to pay off in the medium term as regards employment. As for situations of autonomy without exchanges, they are more often associated with chosen mobility in organisational contexts that are partially favourable to IL, with more passages through transitional training in favourable contexts and with more certification in partially favourable contexts. And this time, the training or certification stage seems to have added value, especially in the medium term.

At this point, however, we can question the scope of our conditioning variables (even with a quasi-saturated specification). To examine the sensitivity of the apparent effects estimated above, additional conditioning are introduced describing the social origin of the employees and the characteristics of their initial company; this removes the non-parametric character of the quasi-saturated approach but allows the addition of conditioning variables without abusing the number of parameters to be considered. This analysis, presented in the Online Appendix C1-4, shows that the consideration of these additional dimensions only marginally alters the apparent effects measured previously. The only exception is the medium term effect of the passage through an unfavourable context for IL and a work activity that provides opportunities for exchange but without autonomy. The social origins favourable to access to employment are over-represented and constitute the bulk of the advantage that this work dynamics seemed to bring in the medium term. This is the only clear challenge to the apparent effect measured from the initial quasi-saturated model.

All in all, the regression analysis does not call into question the general impression gained from Table 3 and 4. In particular, IL-friendly activities do not appear to confer any lasting benefits on externally mobile workers. Exchange situations without autonomy appear to be penalising in the short term without significant influence in the medium term. Finally, autonomous situations without exchanges provide a very clear advantage in the medium term.

3.2. The Dominant Role of Work Activity

Figure I suggests that the bulk of the variation in apparent effects is due to work activities rather than organisational contexts. The results of adjustments using the same specifications as above, but considering in isolated fashion the influence of the type of context and that of the type of work activity, confirm the predominant role of the work activity (see Appendix 3, Table A3-4). The influence of the organisational context is never statistically significant, regardless of the outcome variable (employment or unemployment) or the time scale (short or medium term). On the contrary, there are several significant links between the more or less IL-friendly type of activity and the risk of non-employment or unemployment, particularly in the medium term. This could indicate that it is less the general structuring of collective work than the work activity itself that favours the development of skills. As introducing only one of the two dimensions allows for more precise estimates, the rest of the analysis is conducted at the work activity level only.

The results thus raise unexpected questions about the influence of IL situations. How can engaging in an activity that facilitates cognitive processes, exchanges and autonomy provide no employment advantage? The comparison of the apparent effect of autonomy without exchanges or exchanges without autonomy adds to the perplexity: how can the combination of autonomy and exchanges be detrimental when each aspect taken separately seems (at least in the medium term) to have a positive effect on access to employment? An analysis of the circumstances of mobility and the possibility that the individuals may have gone through training or a skills certification stage may help to explain this.

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5. That is, completed in mid-2015.

6. If we take the fact of being in training in mid-2015 as an outcome variable (results not reported), it turns out, however, that engaging in an activity conducive to IL confers no advantage (within a context that is unfavourable to IL) or even represents a significant handicap (in a context that is at least partially favourable): compared to a basic probability of being in training or returning to school in mid-2015 of 15%, activities conducive to IL are associated with an 8 percentage point drop in a context that is only partially favourable, and even a 12 percentage point drop in a favourable context.

3.3. Circumstances of Mobility, Transitional Training and Certification of Skills

The aim here is to look again at the possible effect of other dimensions likely to influence the probability of subsequent employment: the chosen (rather than involuntary) nature of external mobility; and having gone through transitional training or a certification process (accreditation of prior experiential learning or APEL) between the beginning of 2014 and mid-2015. As the results presented in Table A3-1 (first three columns) suggest, these dimensions are likely to be endogenous, i.e. they are themselves influenced by the variable of interest (i.e. whether the work activity is more or less conducive to IL). The interaction between the apparent effects of the work activity and each of these dimensions is studied to take this into account.

3.3.1. Chosen or Involuntary External Mobility

Two variables are available to describe the circumstances of mobility. One describes the reason for leaving the initial job: resignation (26% of cases), redundancy (15%), contract termination (31%) or "other reasons" (28%). The other indicates whether the mobility was chosen by the worker (59% of cases) or involuntary. However, the two variables are closely related: 96% of resignations were voluntary, 86% of redundancies were involuntary, 56% of contract terminations were involuntary and 36% were for "other reasons". The apparent effect of work activities that are more or less conducive to IL is therefore studied by simply distinguishing between the chosen and unchosen nature of the initial job termination.

As expected, the fact that mobility is chosen by the worker leads in the short term to a significantly higher probability of employment, in the order of 20 percentage points (Figure II). The advantage, however, is hardly significant for workers in situations of exchange without autonomy. In addition, given the choice of mobility, there is no significant benefit in either the short or medium term from working in an IL-conducive (rather than non-IL-conducive) activity. As far as involuntary mobility is concerned, activities conducive to IL even prove to be a handicap compared with those that are not: the probability of employment with given conditioning variables would be reduced by about 20 percentage points in the short or medium term.

3.3.2. Transitional Training or Certification

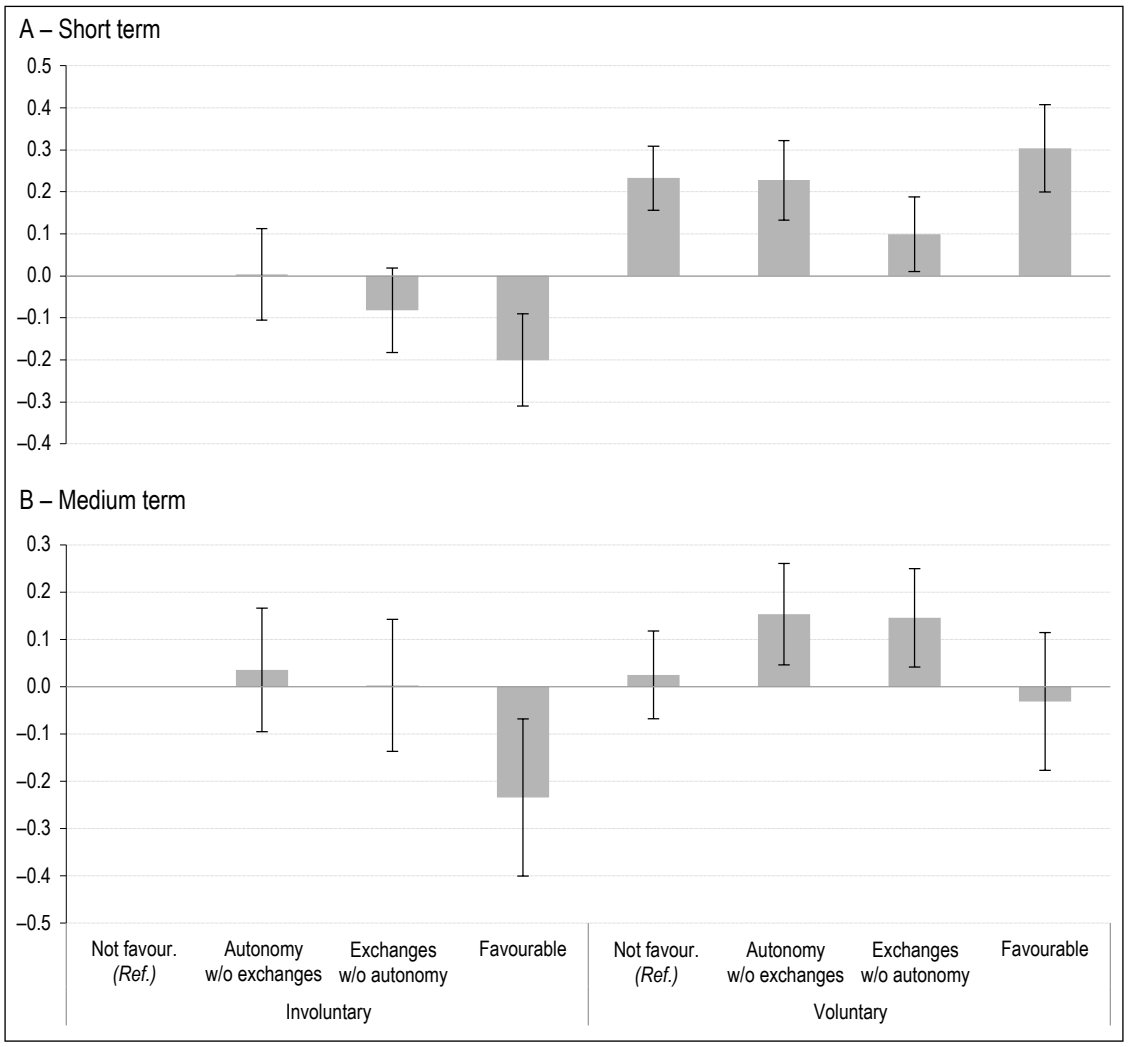
Does the apparent effect of more or less IL-conducive work activities vary depending on whether or not workers underwent training between early 2014 and mid-2015? In the short term, there is no significant difference in the probability of employment for those who went through training (Figure III). For the others, we observe a lower probability of employment associated with the initial situations of exchanges without autonomy compared to the non-conducive situations. In the medium term, having undergone training results in a virtual levelling of the probabilities of employment depending on the initial work situation. In the absence of training, situations of autonomy without exchange or exchange without autonomy seem to be favourable, but paradoxically this is not the case for the activities considered to be the most conducive to IL. This examination of the apparent effect of work situations with or without training confirms the general impression of a "premium", in terms of probability of employment, for situations of autonomy without exchanges.

What about taking into account a skills certification process such as the accreditation of prior experiential learning (APEL[7])? From the perspective of signal theory (Spence, 1973), this should improve the outcome of IL-favourable situations by making visible the skills acquired outside of training. Is this the case? The answer is quite different depending on whether one considers the short or the medium term (Figure IV).

In the short term, one of the most advantageous situations in terms of probability of employment is paradoxically the pursuit of a non-IL-conducive activity without recourse to APEL. The use of APEL appears to significantly reduce the chances of access to employment, particularly for those who had engaged in IL-conducive activity. The impression is radically different in the medium term for jobs are partially conducive to IL. This time, it is in the presence of APEL that we observe a (significant) increase in access to employment, particularly for exchange situations without autonomy, as APEL seems to offset the lower probability of employment (cf. Table A3-4 in Appendix 3). One possible interpretation of the differences observed between the short and medium term is that the APEL process takes time and only has a tangible impact in the medium term. There remains, however, another paradoxical case: that of work activities conducive to

7. The APEL system allows any person to obtain a full diploma or degree thanks to their professional experience, whether this experience was acquired through salaried, non-salaried or voluntary activities. APEL applies to all diplomas and degrees for professional purposes offered by the various certifying bodies (ministries, professional branches) as long as the certificates in question are registered in a National directory of professional certifications.

Figure II – **Apparent effect on the probability of employment of work activities more or less conducive to informal learning according to the voluntary or involuntary nature of external mobility. Linear probability model, OLS estimates on weighted data**



Notes: The measures of apparent effect proposed here are obtained by adjusting for the individual characteristics of the worker (59 indicators), their social origin (24 indicators) and the characteristics of their initial company (47 indicators). The baseline here is involuntary mobility from a non-IL conducive activity. The confidence intervals depicted are at the 90% level, and are robust (heteroscedasticity). The weighting applied for 2016 corrects for attrition.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

IL, which do not seem to be associated with any gain in terms of the probability of employment in either the short or medium term.

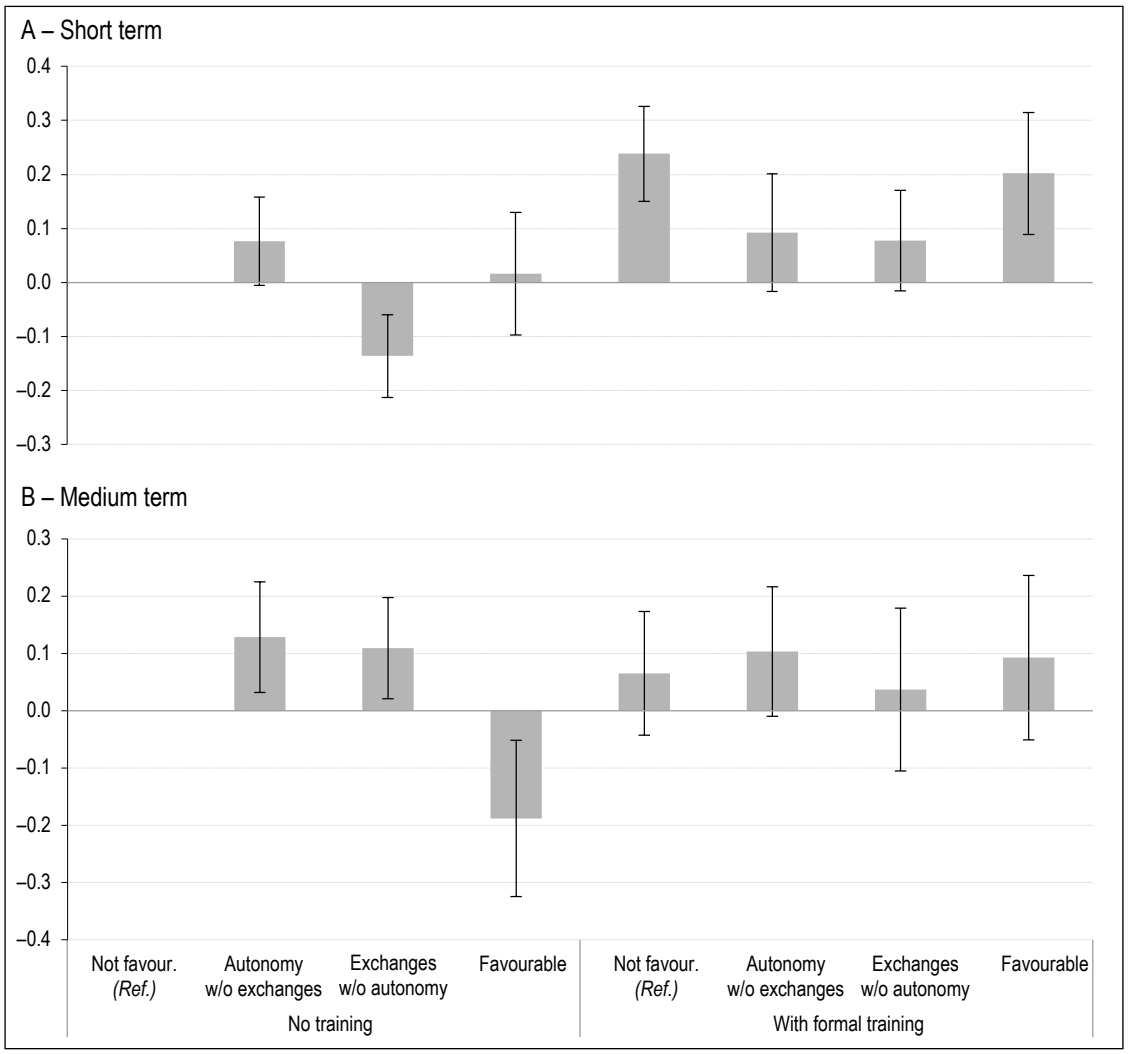
3.4. Analysis by Instrumental Variables

While the analysis of the role of the circumstances of external mobility puts the results obtained above into perspective, it does not allow us to appreciate the causal significance of the regression analysis. The results obtained may still be due to compositional effects, but this time in dimensions omitted until now. There are variables whose importance is not considered and others that simply remain unobserved in the DEFIS; workers assigned to the different work dynamics can be selected according to criteria that are not captured by the conditioning variables introduced.

This risk is examined using a complementary instrumental variable analysis for a sample of externally mobile workers who at the end of 2013 were in a company where at least one other surveyed employee remained with the same employer (see Online Appendix C4). This approach makes it possible to diagnose the endogenous nature of the assignment of externally mobile workers to a work activity that is more or less conducive to IL.

The tests conducted do not reject the hypothesis of exogeneity of the assignment: the assumption of conditional independence is not rejected and the OLS estimation provides coefficients that

Figure III – **Apparent effect on the probability of employment of work activities more or less conducive to informal learning depending on completion of transitional training. Linear probability model, OLS estimates on weighted data**



Notes: cf. Figure II.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

admit a causal interpretation. Only the assignment to the activities most conducive to IL (cognitive processes + exchanges + autonomy) remains somewhat ambiguous: there are tenuous indications that it may be counter-selective in an omitted dimension; in other words, it would over-represent workers who have *ex ante* fewer assets in the face of labour market demands. Ultimately, only work activities combining cognitive processes and autonomy without exchanges appear to have a potential for securing career paths for mobile workers, a potential that is fairly strong in the medium term, albeit measured in an imprecise manner.

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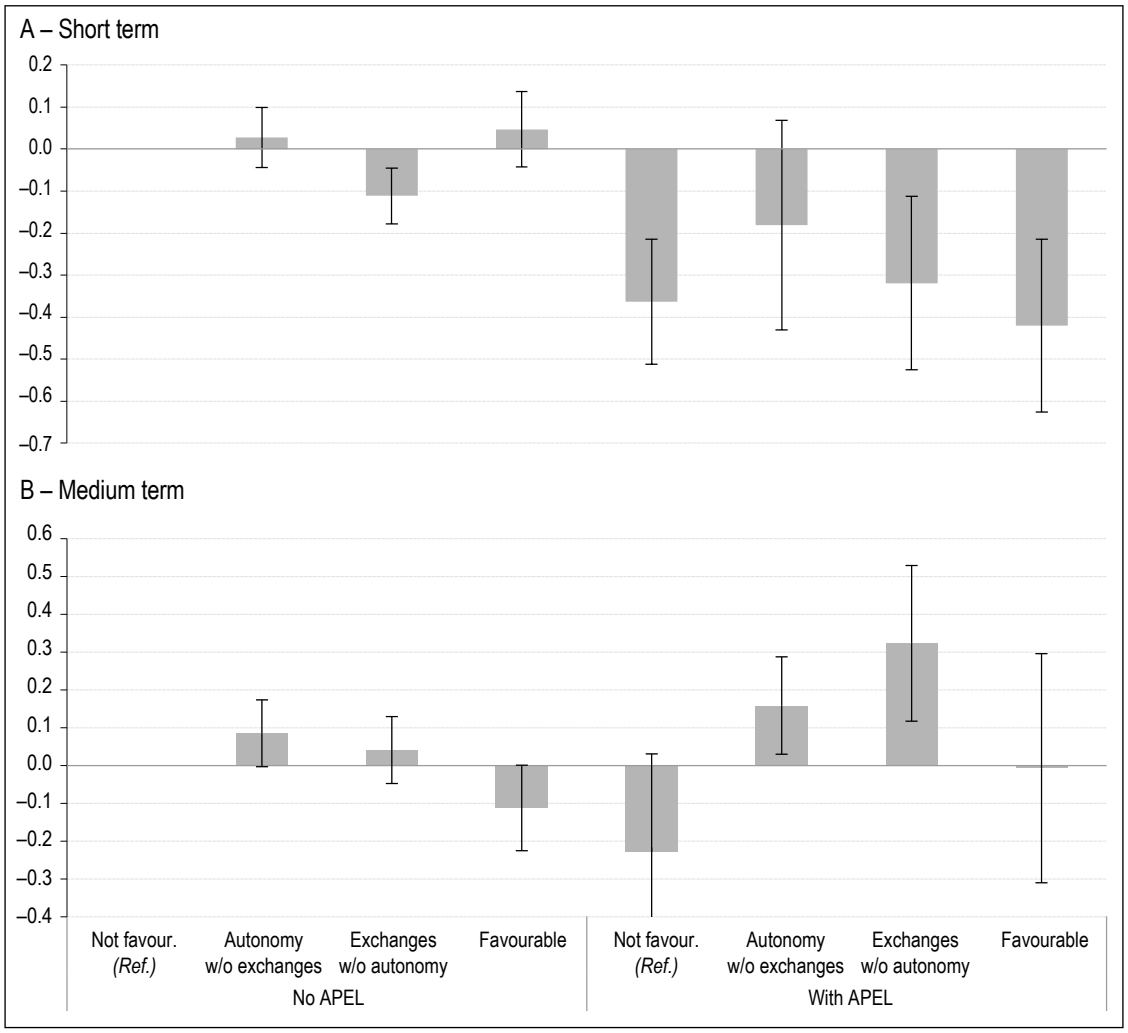
In this study, the probability of employment of externally mobile individuals was estimated based on the learning potential of their initial work situation. In both the short and medium term, the organisational context does not seem to play a decisive role. The statistically significant relationships are more likely to be found in the work activity and appear to be counter-intuitive. The only advantageous situation corresponds to a work activity combining cognitive processes and autonomy without exchanges; the activities most conducive to IL, which combine the three aspects, do not provide any advantage in terms of access to employment. The significance of this outcome is questioned by attempting to neutralise the comparison biases that may occur. Regression analysis shows that, in terms of observed characteristics, the assignment to activities conducive to IL is not particularly

Figure IV – **Apparent effect of work activity on the probability of employment of externally mobile individuals according to their use of skills certification (APEL). OLS estimates on weighted data**



Notes: cf. Figure II.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector, excluding retirees and early retirees.

counter-selective, i.e. reserved for profiles that are less well-endowed in terms of labour market requirements. The risk remains that workers assigned to the most IL-friendly jobs will differ from others in an omitted (unobserved) dimension that negatively influences access to employment. An instrumental variable approach makes it possible, under the same conditioning variables, to conclude that assignment to activities that are partially conducive to IL is exogenous: the comparison with workers assigned to a non-conducive activity would therefore not be biased. Activities combining cognitive processes and autonomy statistically significantly reduce the risk of unemployment in the medium term for externally mobile people.

This result raises the question of how a work activity that adds an IL element (professional exchanges) can be less beneficial. One explanation could be as follows. While the conducive activities allow for the development of skills, they also facilitate the evaluation of the worker: autonomous situations have a testing dimension, professional exchanges have a control dimension. In the case of external mobility, one might imagine that the experience of a situation combining autonomy and exchanges represented a test whose outcome may have proved unfavourable to the worker, particularly in the case of involuntary mobility. The return on the extra skills would then, in the medium term, be inhibited by a disappointing test outcome. The possibility that the assignment to these situations is counter-selective (in a dimension omitted from the list of selected conditioning variables) is consistent with this interpretation: testing would occur in the case of workers who are *ex ante* less well-prepared for the demands of the labour market. Activities combining cognitive processes and exchanges without

autonomy would be those of workers exempt from testing. Only work activities combining cognitive processes and autonomy without exchanges would offer an opportunity for skills development without evaluative intent on the part of the employer, perhaps revealing more confidence in the employee's qualities.

A look back at the study by Fournier *et al.* (2017a) feeds into this interpretation when considering variable by variable what contrasts activities offering cognitive processes and autonomy without exchanges to others (Fournier *et al.*, 2017c, p. 6). 72% of workers in such an activity state that their work is only sometimes or never controlled (50% for all workers), 9% state that they are assigned numerical targets (46% for all workers) and 40% state that they are evaluated (69% among workers in an activity combining cognitive processes, exchanges and autonomy and 72% in an activity with cognitive processes and exchanges without autonomy). Professional exchanges are therefore often associated in practice with a control dimension of the work activity. The advantage associated, for externally mobile workers, with activities combining cognitive processes and autonomy without exchanges could thus be due to the enabling environment of these work situations. This would translate into an increased ability to initiate mobility or certification of prior learning (in organisational contexts that are partially favourable to IL) or to undertake transitional training (in contexts that are favourable to IL). Conversely, in the context of external mobility, a situation combining autonomy and exchanges would more often refer to a trial period whose outcome may have been disappointing. Mobility would then concern workers with a diminished perception of their competence, which would make them vulnerable on the labour market. This ambivalence of professional exchanges would be consistent with certain results of van der Heijden *et al.* (2009), who observe in particular the absence of a statistical association between the intensity of exchanges with the hierarchy and the main dimensions of the feeling of employability (quality of expertise, anticipation, efficiency and adaptability). It could also refer to a learning condition readily invoked by professional didactics (Mayen & Gagneur, 2017): the right to make mistakes. □

Link to the Online Appendix:
https://www.insee.fr/en/statistiques/fichier/6472321/ES532-33_Baguelin-Fretel_Annexe-en-ligne_Online-Appendix.pdf

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APPENDIX 1

THE FOURNIER, LAMBERT AND MARION-VERNOUX TYPOLOGY

Fournier *et al.* (2017b, 2017c) conduct two separate factor-based multiple correspondence analyses (MCA): one, based on the DEFIS company component, to describe the variety of organisational contexts; the second, based on the employee component, to describe the variety of work activities. Typologies are then obtained from hierarchical bottom-up classifications and aggregation around moving centres, giving three organisational context classes and four work activity classes. The concept of work dynamics put forward by Fournier *et al.* (2017b) allows for all combinations of activity × context categories.

The MCA conducted on company data uses twelve active variables to generate a space of more or less favourable contexts for IL, and the MCA on employee data uses nineteen active variables (Table A1).

The structure of the space generated from company-level data can be described in six main axes that Fournier *et al.* interpret as management factors: decompartmentalising work, creating links between the different jobs, broadening the scope of action (main correlates: variables 1 and 2); encouraging dialogue and information sharing in the work and on training (variable 3); encouraging reflection on practice in the light of contingencies or events encountered (variables 4, 5 and 6); encouraging the ability to pass on and explain one's professional competence (variables 7, 8 and 9); encouraging individual commitment through management practices that value the collective (variables 10 and 11); providing prospects for development, mobility (variable 12). Contexts that are favourable to IL involve all six of the identified factors; contexts that are partially favourable involve only three of the six factors (dialogue and sharing of information, transmission of skills and development prospects); unfavourable contexts involve none.

The structure of the space generated by the variables at employee level is described in three main axes: the work is a place of exchange and discussion of know-how and professional practices (main correlates: variables 1 to 6); the work situation calls for and activates cognitive processes (variables 7, 8, 10 to 13); the work allows autonomy and initiative (variables 14 to 18). This results in four classes: activities conducive to IL that involve all three dimensions (cognitive processes, exchanges and autonomy); activities that combine cognitive processes and exchanges but without autonomy; activities that combine cognitive processes and autonomy but without exchanges; and non-conducive activities that do not involve any of the three dimensions.

Table A1 – **MCA Variables**

Context	Activity
(1) The company uses autonomous work groups	(1) Works in a team
(2) It allows employees to control their own work	(2) Holds several job positions
(3) It has analysed the qualification or skill needs of staff	(3) Attends meetings
(4) It has formalised methods for solving problems	(4) Has been taught by a colleague how to do the job
(5) It has an approach to standardising work processes and methods	(5) Has taught to colleagues
(6) It attaches importance to novelty, innovation or has benefited from the research tax credit	(6) Has to go to trade fairs, conferences, meetings
(7) It takes on apprentices	(7) Non-repetitive actions
(8) It formally identifies employees as trainers or tutors	(8) Uses a computer
(9) It organises on-the-job training or training by task rotation	(9) Uses a machine or device
(10) It attaches importance to reputation, tradition and the brand	(10) Has to follow quality procedures
(11) It implements a wage incentive policy based on collective performance	(11) Contact with the public
(12) It provides training to encourage mobility, provides information on training and discusses the issues of mobility, changes in work content and skills enhancement during interviews	(12) Work involves reading, writing
	(13) Speaks a foreign language
	(14) Work is occasionally or never controlled
	(15) Possibility of deciding on hours
	(16) Possibility of measuring results of work, has numerical targets
	(17) Possibility of changing targets
	(18) Is evaluated
	(19) Executive engineer

APPENDIX 2

DESCRIPTIVE STATISTICS FOR SHORT AND MEDIUM TERM SAMPLES

Table A2-1 – **Individual characteristics of externally mobile workers**

	Unweighted frequencies (%)		Equality of proportions test
	2015	2016	
Gender			
Male	58.3	58.3	n.s.
Female	41.7	41.7	n.s.
Age			
<20	6.6	5.8	n.s.
20-24	23.5	21.7	n.s.
25-29	16.7	16.0	n.s.
30-34	12.2	11.4	n.s.
35-39	9.7	10.1	n.s.
40-44	10.3	11.4	n.s.
45-49	8.7	10.2	0.1
50-54	6.9	7.6	n.s.
55-59	5.5	5.7	n.s.
Level of education			
No qualification (or primary school certificate)	6.7	6.6	n.s.
Certificate of general education, *Brevet des collèges*), BEPC (secondary school leaving certificate)	4.0	4.1	n.s.
CAP vocational qualification, BEP or diploma of this level	21.8	20.2	n.s.
General or technological baccalaureate	9.6	9.4	n.s.
Professional baccalaureate or diploma of this level	11.2	10.3	n.s.
Baccalaureate+2 (DEUG, BTS, DUT)	16.0	15.7	n.s.
Baccalaureate+3 (general or professional diploma)	9.6	10.3	n.s.
Baccalaureate+4 (Maitrise, Master 1)	5.5	5.9	n.s.
Baccalaureate+5 (DESS, DEA. Master 2)	11.2	12.5	n.s.
Grande école, engineering school, doctorate	4.4	4.9	n.s.
Father's socio-professional group (at the individual's 16th birthday)			
Self-employed	14.4	13.9	n.s.
Executive or middle management	26.4	27.8	n.s.
White-collar worker	20.7	19.1	n.s.
Blue-collar worker	27.2	28.4	n.s.
Unemployed or retired	11.3	10.8	n.s.
Mother's socio-professional group (at the individual's 16th birthday)			
Self-employed	6.1	6.2	n.s.
Executive or middle management	13.0	13.1	n.s.
White-collar worker	35.5	35.0	n.s.
Blue-collar worker	11.5	12.0	n.s.
Unemployed or retired	33.8	33.8	n.s.
Sample size	2,761	1,646	

Notes: n.s. for non-significant differences at the 1% level.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees.

Table A2-2 – **Characteristics of employers in 2013**

	Unweighted frequencies (%)		Equality of proportions test
	2015	2016	
Total workforce of the employer/company at the end of 2013			
10 to 19 employees	12.9	13.5	n.s.
20 to 49 employees	19. 6	19.0	n.s.
50 to 249 employees	22.8	22.8	n.s.
250 to 499 employees	7.4	7.2	n.s.
500 to 999 employees	7.9	8.3	n.s.
1000 to 1999 employees	8.0	8.5	n.s.
2000+ employees	21.4	20.7	n.s.
Sector used in the sample draw (15 classes)			
C3 - Manufacture of electrical, electronic and IT equipment and machinery	1.8	2.4	n.s.
C4 - Manufacture of transport equipment	1.3	1.1	n.s.
C5 - Manufacture of other industrial products	7.1	7.3	n.s.
CR - Manufacture of food, beverages and tobacco products, coking and refining	3.7	3.7	n.s.
DE - Mining and quarrying, energy, water, waste management and remediation industries	1.0	0.9	n.s.
FZ - Construction	6.6	6.1	n.s.
GZ - Motor vehicle and motorcycle trade and repair industry	22.4	21.2	n.s.
HZ - Transport and storage	5.3	5.4	n.s.
IZ - Hospitality	7.9	7.0	n.s.
JZ - Information and communication services	5.5	6.0	n.s.
KZ - Financial and insurance activities	2.1	1.9	n.s.
LZ - Property activities	0.9	1.0	n.s.
MN - Specialist scientific and technical activities and administrative and support service activities	25.9	27.9	n.s.
OQ - Public administration, education, human health and social work	5.9	5.3	n.s.
RU - Other service activities	2.7	2.6	n.s.
Reason for discontinuation of the employment contract at the end of 2013			
Resignation	26.7	26.7	n.s.
Contract termination	31.0	30.2	n.s.
Redundancy	14.6	14.8	n.s.
Other employment contract terminations	16.3	17.0	n.s.
Other cases	9.7	9.6	n.s.
Do not know	1.6	1.6	n.s.
Sample size	2,761	1,646	

Notes: n.s. for non-significant difference at the 1% level.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees.

The equality of proportions tests show that the short and medium term samples are essentially similar so that the differences in effects measured in the short and medium term do indeed have economic significance.

APPENDIX 3

DETAILED RESULTS OF OLS ESTIMATES

Table A3-1 – **Apparent effect of work situations more or less favourable to informal learning on various short term outcomes. Short term sample (*N*=2,761) quasi-saturated linear probability model, OLS estimates, weighted data**

	Voluntary mobility	Training or certification stage (between 2014 and mid-2015)		Short term activity status (2015)	
		Training	APEL	Employment	Unemployment
Baseline probability#	0.378 ***	0.213	0.050	0.418 ***	0.399 ***
	(0.127)	(0.112)	(0.043)	(0.151)	(0.135)
Context unfavourable to informal learning					
Non-conducive activity	0.009	−0.020	−0.012	0.036	−0.012
	(0.064)	(0.050)	(0.023)	(0.058)	(0.052)
Autonomy w/o exchanges	−0.109	0.098	0.015	−0.030	−0.023
	(0.086)	(0.079)	(0.030)	(0.084)	(0.077)
Exchanges w/o autonomy	−0.009	0.085	−0.029	−0.300 ***	0.302 ***
	(0.093)	(0.089)	(0.031)	(0.080)	(0.086)
Conducive activity	0.077	0.229 *	0.016	−0.182	0.132
	(0.106)	(0.118)	(0.029)	(0.115)	(0.114)
Context partially favourable to informal learning					
Non-conducive activity	*Ref.*	*Ref.*	*Ref.*	*Ref.*	*Ref.*
Autonomy w/o exchanges	0.162 ***	0.111	0.123 **	0.073	−0.057
	(0.052)	(0.070)	(0.056)	(0.067)	(0.061)
Exchanges w/o autonomy	−0.123 **	0.131 **	0.049	−0.029	0.006
	(0.060)	(0.057)	(0.035)	(0.062)	(0.055)
Conducive activity	0.221 ***	0.117 *	0.007	0.138 *	−0.048
	(0.059)	(0.067)	(0.041)	(0.079)	(0.069)
Context favourable to informal learning					
Non-conducive activity	0.008	−0.043	−0.001	0.030	0.004
	(0.061)	(0.052)	(0.020)	(0.062)	(0.060)
Autonomy w/o exchanges	−0.027	0.111 *	0.026	0.024	−0.041
	(0.063)	(0.060)	(0.025)	(0.063)	(0.060)
Exchanges w/o autonomy	0.047	0.096 *	0.047 *	−0.156 ***	0.129 **
	(0.055)	(0.053)	(0.026)	(0.059)	(0.055)
Conducive activity	0.004	0.039	0.049	−0.017	0.053
	(0.071)	(0.069)	(0.043)	(0.086)	(0.075)
Conditioning variables	Gender × age × education (× 59)				
R^2	0.14	0.12	0.10	0.13	0.15
R^2 adjusted	0.12	0.10	0.08	0.10	0.13

Notes: The baseline is a male under 25 years of age with a BEPC or lower. The standard deviations in brackets are robust (heteroscedasticity). The weighting applied for 2016 corrects for attrition.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector.

Table A3-2 – **Apparent effect of work situations more or less favourable to informal learning – Variants, robustness checks and medium term. Quasi-saturated linear probability model, OLS estimates, weighted data (unless otherwise indicated)**

	Employment status in the short term (2015 – *N*=2,761)			Unweighted data (2015)	Medium term activity status (2016 – *N*=1,646)	
	Employment	Full-time	Permanent	Employment	Employment	Unemployment
Baseline probability	0.418 ***	0.300 *	0.183	0.314 ***	0.734 ***	0.227
	(0.151)	(0.158)	(0.165)	(0.081)	(0.139)	(0.138)
Context unfavourable to informal learning						
Non-conducive activity	0.036	−0.007	0.064	−0.007	0.047	−0.036
	(0.058)	(0.058)	(0.059)	(0.035)	(0.076)	(0.071)
Autonomy w/o exchanges	−0.030	0.021	0.020	0.044	0.167	−0.179 **
	(0.084)	(0.080)	(0.081)	(0.051)	(0.106)	(0.075)
Exchanges w/o autonomy	−0.300 ***	−0.213 ***	−0.209 ***	−0.098 *	0.148	−0.157 *
	(0.080)	(0.069)	(0.064)	(0.058)	(0.107)	(0.094)
Conducive activity	−0.182	−0.063	0.000	−0.134 *	−0.301 ***	0.172
	(0.115)	(0.123)	(0.123)	(0.075)	(0.116)	(0.166)
Context partially favourable to informal learning						
Non-conducive activity	*Ref.*	*Ref.*	*Ref.*	*Ref.*	*Ref.*	*Ref.*
Autonomy w/o exchanges	0.073	0.161 **	0.108 **	0.078 **	0.180 ***	−0.173 ***
	(0.067)	(0.065)	(0.062)	(0.038)	(0.068)	(0.058)
Exchanges w/o autonomy	−0.029	0.024	−0.010	0.011	0.166 *	−0.157 *
	(0.062)	(0.061)	(0.054)	(0.033)	(0.091)	(0.089)
Conducive activity	0.138 *	0.196 **	0.048	−0.001	−0.189	0.208
	(0.079)	(0.085)	(0.072)	(0.050)	(0.133)	(0.132)
Context favourable to informal learning						
Non-conducive activity	0.030	0.058	0.023	−0.011	−0.027	0.024
	(0.062)	(0.061)	(0.051)	(0.037)	(0.084)	(0.079)
Autonomy w/o exchanges	0.024	0.018	0.060	0.082 **	0.050	−0.142 **
	(0.063)	(0.064)	(0.062)	(0.038)	(0.082)	(0.065)
Exchanges w/o autonomy	−0.156 ***	−0.079	−0.058	−0.066 *	0.071	−0.017
	(0.059)	(0.052)	(0.052)	(0.035)	(0.075)	(0.070)
Conducive activity	−0.017	−0.016	−0.059	0.065	0.031	0.057
	(0.086)	(0.079)	(0.070)	(0.048)	(0.092)	(0.086)
Conditioning variables	Gender × age × education (× 59)					
R^2	0.13	0.12	0.13	0.075	0.17	0.19
R^2 adjusted	0.10	0.10	0.11	0.051	0.13	0.16

Notes: The standard deviations in brackets are robust (heteroscedasticity). The weighting applied for 2016 corrects for attrition.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector.

Table A3-3 – **Apparent effect of work situations more or less favourable to informal learning – robustness to the addition of supplementary conditioning variables. Short term sample (*N*=2,761). Linear probability model, OLS estimates, weighted data**

	Voluntary mobility	Training or certification stage (2014-2015)		Short term activity status (2015)	
		Training	APEL	Employment	Unemployment
Baseline probability	0.546 ***	0.104	0.020	0.250	0.558 ***
	(0.152)	(0.133)	(0.068)	(0.158)	(0.160)
Context unfavourable to informal learning					
Non-conducive activity	−0.019	0.007	0.016	0.046	−0.039
	(0.055)	(0.049)	(0.025)	(0.055)	(0.049)
Autonomy w/o exchanges	−0.123	0.111	0.033	−0.016	−0.053
	(0.079)	(0.074)	(0.034)	(0.086)	(0.076)
Exchanges w/o autonomy	0.008	0.097	0.002	−0.264 ***	0.256 ***
	(0.085)	(0.077)	(0.028)	(0.074)	(0.085)
Conducive activity	0.057	0.236 *	0.022	−0.158	0.097
	(0.112)	(0.125)	(0.041)	(0.125)	(0.113)
Context partially favourable to informal learning					
Non-conducive activity	*Ref.*	*Ref.*	*Ref.*	*Ref.*	*Ref.*
Autonomy w/o exchanges	0.200 ***	0.099	0.130 **	0.076	−0.062
	(0.052)	(0.065)	(0.053)	(0.065)	(0.059)
Exchanges w/o autonomy	−0.100 *	0.108 **	0.058 *	−0.032	−0.002
	(0.054)	(0.054)	(0.035)	(0.059)	(0.054)
Conducive activity	0.214 ***	0.137 **	0.043	0.106	−0.041
	(0.062)	(0.065)	(0.035)	(0.082)	(0.072)
Context favourable to informal learning					
Non-conducive activity	−0.038	−0.003	0.026	0.043	−0.017
	(0.058)	(0.051)	(0.024)	(0.060)	(0.057)
Autonomy w/o exchanges	0.019	0.113 **	0.027 **	0.011	−0.044
	(0.062)	(0.057)	(0.027)	(0.064)	(0.059)
Exchanges w/o autonomy	0.042	0.133	0.061	−0.142 **	0.114 **
	(0.052)	(0.055)	(0.045)	(0.056)	(0.055)
Conducive activity	0.058	0.058	0.070	0.034	0.013
	(0.071)	(0.070)	(0.111)	(0.075)	(0.068)
Conditioning variables	Gender × age × education (× 59) + social origin (× 24) + size × sector (× 47)				
R^2	0.24	0.20	0.17	0.19	0.22
R^2 adjusted	0.20	0.15	0.13	0.15	0.18

Notes: The standard deviations in brackets are robust (heteroscedasticity). The weighting applied for 2016 corrects for attrition.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector.

Table A3-4 – **Apparent effects of work situations more or less favourable to informal learning – Separating context and activity dimensions. Linear probability model, OLS estimates, weighted data**

Activity status …		Short Term (2015)		Medium Term (2016)	
		Employment	Unemployment	Employment	Unemployment
Adjustment for organisational context type					
Baseline probability#		0.271	0.560 ***	0.692 ***	0.382 **
		(0.165)	(0.162)	(0.197)	(0.184)
Context	Unfavourable	−0.049	0.036	−0.005	−0.002
		(0.043)	(0.039)	(0.050)	(0.045)
	Partially favourable	*Ref.*	*Ref.*	*Ref.*	*Ref.*
	Favourable to IL	−0.044	0.042	−0.046	0.051
		(0.036)	(0.035)	(0.042)	(0.040)
	R^2	0.174	0.203	0.261	0.280
	R^2 adjusted	0.132	0.163	0.197	0.217
Adjustment for type of work activity					
Baseline probability#		0.233	0.578 ***	0.716 ***	0.340
		(0.157)	(0.159)	(0.190)	(0.179)
Activity	Not conducive	*Ref.*	*Ref.*	*Ref.*	*Ref.*
	Autonomy w/o exchanges	0.019	−0.044	0.103 **	−0.135 ***
		(0.045)	(0.041)	(0.051)	(0.043)
	Exchanges w/o autonomy	−0.116 ***	0.079 **	0.068	−0.051
		(0.041)	(0.038)	(0.053)	(0.050)
	Conducive to IL	0.028	0.009	−0.102	0.139 **
		(0.055)	(0.048)	(0.069)	(0.068)
	R^2	0.183	0.209	0.270	0.296
	R^2 adjusted	0.141	0.169	0.206	0.235
Conditioning variables		Gender × age × education (59 indicators) + social origin (24 indicators) + size × company sector (47 indicators)			
N		2,761	2,761	1,646	1,646

Notes: The baseline is a male under 25 years of age with a BEPC or lower, whose two parents were inactive (at the time of his 16th birthday) and employed at the end of 2013 by a company with 10 to 19 employees in the motorcycle/automobile trade and repair sector. The standard deviations in brackets are robust (heteroscedasticity) (White's standard deviations). The weighting applied for 2016 corrects for attrition.
Sources and coverage: CNEFP-Céreq, DEFIS 2015 and 2016; former employees of a company with ten or more employees in the private non-agricultural sector.