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## Labor unions and the performance of firms

Fabien-Antoine Dugardin

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**DE L'UNIVERSITÉ PSL**

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**Syndicats de salariés et performance des entreprises**

Soutenue par

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À la mémoire  
de  
Gérard Dugardin



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L'Université Paris-Dauphine n'entend donner aucune approbation, ni improbation aux opinions émises dans cette thèse ; elles doivent être considérées comme propres à leur auteur.





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# Introduction

Les Français ont une vision pessimiste du dialogue social en France alors même qu'ils pensent qu'un dialogue social de qualité permettrait des gains micro- et macro-économiques significatifs. En 2014, un sondage Opinion Way mettait en lumière que 83 % des Français jugent que les relations entre syndicats et employeurs au mieux sont sans effet et au pire freinent la croissance et la performance des entreprises et respectivement 82 % et 69 % portent un jugement identique sur l'emploi et sur l'amélioration des conditions de travail. Cependant, la majorité des répondants croit au potentiel mélioratif d'un dialogue social de qualité. 81 % des répondants considèrent qu'il améliorerait les conditions de travail des salariés, 74 % qu'il contribuerait à la croissance et à la performance des entreprises, 72 % qu'il aiderait au développement de l'emploi et 65 % qu'il augmenterait le pouvoir d'achat. Les Français pensent donc qu'une bonne relation entre syndicats et employeurs permettrait une amélioration à la fois des conditions des salariés et des employeurs. Les attentes des Français envers les syndicats et leurs relations avec les employeurs sont donc très élevées.

L'entreprise est un nœud de contrats [[Jensen and Meckling, 1976](#)] qui lie diverses parties prenantes afin de créer de la valeur. La valeur créée par l'entreprise est ensuite répartie entre toutes les parties prenantes en fonction de leur position dans le rapport de force qui existe entre elles. Les syndicats de salariés sont des organisations qui représentent les salariés dans leurs relations avec les autres parties prenantes, tout particulièrement vis-à-vis de la direction qui assure la représentation légale de l'entreprise et concentre les pouvoirs discrétionnaires en matière d'emploi et de conditions d'emploi. Les syndicats de salariés mènent les négociations collectives avec l'employeur sur une grande variété de thématiques, notamment celles des salaires, des conditions de travail et du niveau de

l'emploi, afin d'améliorer la situation des salariés qu'ils représentent. Au-delà de leurs prérogatives au niveau collectif, les syndicats de salariés offrent des services individuels aux employés, notamment en termes d'information professionnelle et de protection en cas de violation des engagements contractuels de l'entreprise. Ainsi, les salariés se font représenter afin d'améliorer leur position dans le rapport de force qui existe, entre parties prenantes, au sein de l'entreprise. Conjointement avec les caractéristiques de chaque partie prenante, le contexte légal, réglementaire, économique, social et culturel conditionne la position de chacune des parties prenantes dans ce rapport de force. Si l'une des parties prenantes gagne du pouvoir, il est possible que cela ait un effet non nul sur la situation des autres parties.

La représentation des salariés par les syndicats peut avoir un effet à la fois sur la création de valeur par l'entreprise et sur la répartition de cette valeur entre les différentes parties prenantes. Du point de vue de la capacité de l'entreprise à créer de la valeur, les syndicats peuvent avoir un effet positif sur les conditions de production en améliorant les flux d'informations mais ils peuvent également avoir un effet négatif en empêchant les réorganisations et restructurations nécessaires, afin d'en éviter les conséquences sur l'emploi, ou en instaurant des systèmes de rémunération désincitatifs. Au niveau de la redistribution de la valeur créée par l'entreprise, il est attendu des syndicats qu'ils augmentent ou *a minima* qu'ils ne fassent pas baisser les salaires des employés. Si la valeur créée par l'entreprise augmente, les salaires peuvent augmenter en maintenant un même taux de distribution de la valeur ajoutée.

La vive concurrence sur les marchés des biens et des services rend difficile d'augmenter la valeur ajoutée par une réduction des coûts d'achat ou une augmentation des prix de vente. Dans ce contexte, l'augmentation de la valeur créée devra donc venir d'une augmentation de la productivité du travail, c'est-à-dire d'une amélioration des conditions de production. Cette amélioration peut s'exprimer par une meilleure organisation spatiale, de meilleures procédures, ou une plus grande implication des salariés. Par contre, si la valeur créée n'augmente pas ou diminue, l'augmentation des salaires ne peut avoir lieu qu'en augmentant la part de la valeur ajoutée revenant aux salariés. Augmenter cette part revient, symétriquement, à diminuer celle des autres parties prenantes. Si la part revenant

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à l'État est largement rigide, car régie par des normes légales et réglementaires, celles revenant aux créanciers bancaires et obligataires le sont également car les marchés de la dette et des capitaux propres sont très concurrentiels depuis les vagues de déréglementation des marchés financiers de la seconde moitié du vingtième siècle. Ainsi, il sera plus facile pour les syndicats d'augmenter les salaires s'ils augmentent également la productivité des entreprises. Cette réflexion est d'ailleurs largement corroborée par les résultats présentés dans le premier chapitre de ce manuscrit.

Rationnellement, les autres parties prenantes mettent en place des dispositifs visant à maximiser leur utilité compte tenu de la présence d'une représentation salariale. Les réponses de chaque partie prenante ont pour objectif de limiter les effets négatifs et de profiter d'éventuels effets positifs de la représentation des salariés. Si la représentation des salariés a un effet sur la création et la répartition de la valeur dans l'entreprise, les associés ou actionnaires, en tant que créanciers résiduels de l'entreprise, doivent être affectés, à moins de faire supporter à une autre partie prenante l'intégralité de l'ajustement, ce qui semble peu probable.

La recherche en finance donne naturellement une place toute particulière à l'étude de la rentabilité des investissements. L'objectif de recherche de cette thèse est d'analyser les effets de la représentation syndicale sur la rentabilité des entreprises, de déterminer les canaux par lesquels ces effets se produisent, et d'analyser d'éventuels dispositifs mis en place par les directions d'entreprise en réponse à ces effets. Les analyses se concentreront sur le syndicalisme français en utilisant des données, classées "secret statistique", produites par différents services au sein des ministères économiques et financiers et du ministère du Travail. Ce manuscrit propose trois travaux de recherche. Le premier étudie l'effet du multi-syndicalisme sur la performance des entreprises tandis que le second et le troisième étudient respectivement l'effet des pratiques de lissage des résultats et l'effet des pratiques d'écarts de rémunération entre les hommes et les femmes comme stratégies de neutralisation des syndicats. Un aperçu de la littérature associant présence syndicale et performance des entreprises ainsi qu'une description du contexte institutionnel encadrant le syndicalisme français sont développés préalablement à une courte présentation des trois travaux de recherche.



## Éléments de littérature

**Les salaires** Le lien entre présence syndicale et rentabilité des entreprises a d'abord été abordé indirectement par le prisme de l'augmentation des salaires induite par l'activité syndicale. La littérature sur la prime salariale syndicale est dense à la fois en économie et en finance. [Lewis, 1963] retravaille un ensemble d'études empiriques pour dresser un état des lieux de la capacité des syndicats américains de la première moitié du vingtième siècle à augmenter les salaires. Il observe que la prime salariale syndicale est positive et varie en fonction du contexte économique, de 0 % à près de 25 %. [Lewis, 1983] présente une seconde analyse examinant les résultats empiriques de nombreuses études réalisées dans les années 1960 et 1970 aux Etats-Unis. Après avoir présenté les modèles de salaires et les méthodologies utilisées par les études contemporaines, il met en garde contre le biais de variables omises. Il soutient que les salariés syndiqués ont des caractéristiques différentes des salariés non syndiqués, c'est-à-dire que le fait d'être représenté par un syndicat n'est pas un traitement aléatoire. En effet, il explique qu'un effet de sélection est à l'œuvre. Si les salariés syndiqués sont payés davantage, alors les personnes à la recherche d'un emploi vont être davantage attirées par les entreprises où elles seraient représentées par un syndicat. Ainsi un système de file d'attente se met en place car l'offre de travail aux entreprises avec représentation syndicale augmente. En réaction, les entreprises avec syndicats peuvent sélectionner les salariés les plus performants, ce qui permet de compenser au moins partiellement la prime salariale syndicale par une meilleure productivité. Lewis admet qu'il est impossible de parfaitement contrôler la qualité des salariés dans les équations de salaire et qu'un biais existe donc toujours. De ce fait, il soutient que les estimations de la prime salariale syndicale sont toujours surévaluées. Il détermine que la prime salariale syndicale varie de 9,6 % à 16,4 %, avec une moyenne de 11,9 %.

[Jarrell and Stanley, 1990] proposent une méta-analyse aux procédures moins sujettes aux critiques méthodologiques que ne le furent les études précédentes de Lewis et analysent les résultats de plus d'une centaine d'études des années 1960 et 1970. Ils montrent que la valeur de la prime salariale syndicale est inférieure à ce que trouve Lewis. La prime varie de 8,9 % à 12,4 %, avec une moyenne de 10,3 %. Par ailleurs, ils montrent que cette valeur

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est directement liée au taux de chômage national. Ce lien entre prime salariale syndicale et taux de chômage est important car il corrobore l'intuition théorique selon laquelle la capacité des syndicats à obtenir des concessions salariales dépend de leur position de force avec les autres parties prenantes. Lorsque le taux de chômage est élevé, la position de force des syndicats est amoindrie, conformément à la théorie de l'armée industrielle de réserve [Marx, 1867]. Karl Marx soutient que les mouvements des salaires sont régulés par la dilatation et la contraction de l'armée industrielle de réserve, c'est-à-dire par l'évolution du taux de chômage. Plus l'armée industrielle de réserve augmente, c'est-à-dire plus la part de la population active sans emploi augmente, plus les salaires baissent, et inversement.

[Duncan and Stafford, 1980] proposent de mieux appréhender le biais de variables omises en proposant une décomposition de la prime et montrent que 40 % de celle-ci est en fait une rémunération correspondant à des conditions de travail différentes de celles des employés non syndiqués. Les employés syndiqués sont soumis à des conditions de travail laissant moins de liberté, impliquant davantage d'efforts physiques et plus d'heures travaillées. Ainsi, en corrigeant ce biais de variables omises, la vraie valeur des primes salariales syndicales serait 40 % moins élevée que celle prévue par la littérature existante.

[Stewart, 1990, Stewart, 1995] proposent deux études basées sur les enquêtes anglaises WERS<sup>1</sup> de 1984 et 1990. [Stewart, 1990] analyse l'effet de la concurrence sur la capacité des syndicats à obtenir des concessions salariales. Il montre que les syndicats dans les entreprises qui font face à des conditions de marché concurrentielles sont incapables d'améliorer les salaires. En revanche, les syndicats dans les entreprises qui ont un pouvoir de marché sont capables d'augmenter la rémunération des salariés de 8 à 10 % en moyenne. Ainsi, moins l'entreprise a de pouvoir de marché, moins les syndicats sont capables d'obtenir des concessions salariales à cause de la disparition des rentes de monopole. Stewart montre également que la position de force des syndicats a un effet direct sur la valeur de la prime salariale syndicale. Dans les établissements où l'employeur est obligé d'embaucher des salariés syndiqués et où ces derniers sont obligés de rester syndiqués tout le long de leur contrat de travail (pre-entry closed shop), la prime salariale syndicale est en moyenne

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<sup>1</sup>Workplace Employment Relations Study from the Department for Business, Innovation & Skills (UK), anciennement Workplace Industrial Relations Surveys (WIRS).

deux fois plus élevée. Ainsi, deux phénomènes concomitants viennent amoindrir le pouvoir des syndicats. D'une part l'accroissement de la concurrence sur tous les marchés vient amoindrir les rentes que les syndicats pouvaient accaparer au profit des salariés, et d'autre part les changements institutionnels de l'époque, notamment l'Employment Act de 1990 qui rend illégaux les "closed shops", vont de manière complémentaire diminuer la capacité des syndicats à obtenir des avantages financiers au profit des salariés. [Stewart, 1995] étudie l'évolution de la prime salariale syndicale entre 1984 et 1990. Il soutient que celle-ci diminue et que cette diminution est expliquée par la disparition de la prime dans les établissements nouvellement créés. Les syndicats qui s'installent dans de nouveaux établissements ne seraient pas en mesure d'améliorer les rémunérations des salariés. Ainsi, les primes dans les anciens établissements continueraient d'exister sous l'effet d'une dépendance de sentier tandis que, dans les nouveaux établissements, les employeurs seraient en mesure de ne pas accéder aux demandes de revalorisation salariale des syndicats.

[DiNardo and Lee, 2004] utilisent une technique de régression par discontinuité (RDD) pour montrer que la mise en place d'un syndicat ne permet pas d'augmenter le salaire moyen dans les entreprises du secteur manufacturier américain entre 1984 et 2001. Selon eux, dans une économie compétitive, l'incapacité pour les syndicats de contrôler l'offre globale de travail proposée aux entreprises les empêche de pouvoir obtenir des gains salariaux significatifs. Tous les résultats suggèrent que le contexte institutionnel et économique détermine la position des syndicats dans le rapport de force qui se joue au sein des entreprises entre les parties prenantes.

Cependant, sur données françaises, [Breda, 2015] montre sur des données d'enquêtes réalisées en 2002 et 2004 que les syndicats en France sont capables d'augmenter les salaires. Il évalue la valeur de la prime salariale syndicale à 2 %, ce qui est moins élevé que la valeur de la prime estimée à 3 % par [Coutrot, 1996] sur des données de 1992. Ces résultats suggèrent qu'en France les syndicats arrivent encore à augmenter les salaires, mais moins qu'auparavant, ce qui corrobore la tendance à la baisse de la prime salariale syndicale dans les pays développés au cours des dernières décennies.

**La productivité** Les syndicats ne limitent pas leurs actions à la revendication salariale. Les syndicats s’immiscent dans toutes les décisions de l’entreprise qui peuvent avoir un effet sur les salariés. Les syndicats s’impliquent donc dans de nombreux domaines qui sont pourtant la prérogative des directions d’entreprise, notamment la définition des systèmes de rémunération, la gestion des carrières, la gestion de la production, l’adoption des changements technologiques et l’opportunité des opérations de restructuration. Les études se sont donc naturellement intéressées au lien entre la présence syndicale et la capacité de l’entreprise à créer de la valeur. Le développement des techniques quantitatives basées sur l’estimation de fonctions de production a permis de donner une fondation théorique à l’étude empirique de l’effet des syndicats sur la productivité.

[Freeman, 1976, Freeman and Medoff, 1979, Freeman, 1980] proposent un cadre théorique afin d’expliquer comment les syndicats peuvent avoir un effet sur la productivité. Il applique la théorie de l’Exit-Voice [Hirschman, 1970] à la situation des salariés dans les entreprises. Les syndicats auraient alors deux visages. Le premier est celui de la vision traditionnelle, ou "Monopoly view", qui définit les syndicats comme des monopoles d’emploi qui cherchent à augmenter les salaires. En complément, le second s’attarde sur les effets non salariaux des syndicats : les syndicats sont des véhicules permettant d’offrir aux salariés un droit à la parole, ou "collective voice", au sein des entreprises et dans la sphère politique. Pour améliorer leurs conditions, les salariés ne sont plus obligés de changer d’entreprise (Exit) mais peuvent décider d’y changer les conditions de travail (Voice). Les effets de la "collective voice" sur la productivité peuvent être positifs si l’employeur profite de cette opportunité pour apprendre et améliorer les conditions et les processus de production, ou négatifs si l’employeur réagit de manière hostile aux propositions des syndicats ou si les syndicats empêchent les restructurations nécessaires à la bonne marche de l’entreprise. L’effet des syndicats sur la productivité dépend donc à la fois de la qualité de l’action syndicale et de la qualité de la réponse apportée par l’employeur.

L’importance de cette bonne relation entre syndicats et employeurs, c’est-à-dire d’un dialogue social de qualité, dans la détermination de la productivité des entreprises n’est pas sans rappeler le résultat du sondage Opinion Way cité en début d’introduction. Par ailleurs, l’intuition selon laquelle une amélioration du dialogue social dans les entreprises

ayant une représentation salariale peut améliorer la productivité n'est pas nouvelle. [Dale, 1949] s'interroge déjà sur l'effet du dialogue social sur la productivité des entreprises où des syndicats sont présents. La coopération entre les syndicats et les employeurs peut prendre diverses formes allant de la simple mise en commun d'informations factuelles à la détermination conjointe où l'avis de la représentation salariale a le même poids que celui de la direction de l'entreprise. La coopération entre syndicats et employeurs doit permettre des gains de productivité qui seront ensuite répartis entre les parties prenantes, notamment les salariés. Sur la base d'un questionnaire envoyé aux responsables d'entreprises américaines du secteur manufacturier dans les années 1940, Dale montre que la mise en place d'une meilleure coopération entre syndicats et employeurs permet d'améliorer la productivité des entreprises. Si les deux parties ont intérêt à coopérer pour augmenter la valeur à répartir entre eux, il soutient que la coopération reste limitée et souvent temporaire. La coopération nécessite des intérêts communs. Ainsi, la coopération fonctionne bien dans la prévention des accidents professionnels car elle profite à chaque partie. La coopération reste toutefois limitée dans les autres domaines pour plusieurs raisons. D'une part, les représentants syndicaux pensent qu'elle peut induire un conflit d'intérêts en nuisant à leur prérogative principale de défense des salariés et que l'opportunisme des employeurs ne permet pas de garantir que les efforts de coopération seront récompensés. D'autre part, les employeurs sont réticents à partager leurs prérogatives managériales et ne pensent pas que les syndicats puissent les aider significativement. Enfin, les intérêts des deux parties sont parfois irréconciliables, notamment dans le cadre des projets portant atteinte à l'emploi comme les changements technologiques majeurs et les grosses restructurations.

A la fin des années 1970 et au début des années 1980, une controverse oppose les partisans de la vision traditionnelle et les membres de la Harvard Business School affiliés à Freeman. Les partisans de la vision traditionnelle ne pensent pas que les syndicats puissent augmenter la productivité. Selon eux, toute hypothétique augmentation de productivité serait de toute façon insuffisante pour compenser l'augmentation des salaires. La logique centrale est que si les syndicats amélioreraient la rentabilité des entreprises, les employeurs le sauraient et accueilleraient à bras ouverts l'arrivée des syndicats dans leur entreprise, ce qui n'est pas le cas.

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Le traditionnaliste [[Pencavel, 1977](#)] analyse la productivité des entreprises anglaises dans l'industrie minière du charbon entre 1900 et 1913 à l'aide d'une fonction de production de type CES et montre que la présence de syndicats est associée à une diminution significative de la production. Une entreprise où la main d'œuvre serait totalement syndiquée aurait une production 22 % plus faible qu'une entreprise comparable où aucun employé ne serait syndiqué.

Les membres de la Harvard Business School [[Brown and Medoff, 1978](#)] s'attardent sur les raisons théoriques qui suggèrent que les syndicats ont un effet sur la productivité des salariés, avant de mener une analyse empirique sur la rotation du personnel, la productivité et les salaires dans les entreprises américaines au sein de vingt secteurs de l'industrie manufacturière pour l'année 1972. Selon eux, la productivité d'un salarié tient à des caractéristiques individuelles et aux caractéristiques de l'entreprise. Les syndicats affectent les salariés dans leur formation professionnelle, leurs interactions avec les autres employés et la direction, leur moral et leur motivation. Les auteurs précisent que les syndicats peuvent avoir également un effet négatif sur la productivité en cherchant à augmenter artificiellement le volume d'emploi, par une restriction des tâches réalisées par certains salariés, la création de tâches inutiles, le recours à une masse salariale trop importante par rapport aux tâches à réaliser, une baisse des cadences de production et une limitation des changements technologiques [[Slichter, 1960](#)]. Enfin, les salariés les plus productifs pourraient être découragés par les systèmes de rémunération collective et les parcours de carrière basés sur l'ancienneté. Les résultats de ces études empiriques montrent que les syndicats diminuent la rotation du personnel et augmentent la productivité et les salaires. Les auteurs soutiennent que la diminution de la rotation du personnel confirme que les syndicats permettent d'améliorer le moral au sein des entreprises, conformément à l'arbitrage "Exit-Voice" [[Freeman, 1980](#)]. Cependant, la diminution de la rotation du personnel n'explique qu'un cinquième de l'augmentation de la productivité. Ainsi, les autres raisons théoriques liant syndicats et productivité sont sûrement à l'œuvre. Enfin, ils concluent en indiquant que la prime salariale syndicale, qu'ils estiment à 20 %, est comparable en magnitude à l'augmentation de la productivité. Cette compensation totale permet d'expliquer pourquoi les établissements avec et sans représentation syndicale peuvent coexister et être en concurrence sur les mêmes marchés de produits.

[Addison, 1982] formule une critique des études qui affirment que les syndicats augmentent la productivité. Tout d'abord, il n'est pas convaincu que le droit à la parole pour les salariés soit une exclusivité des entreprises ayant des syndicats, 30 % des entreprises américaines sans syndicat ayant des procédures formelles de réclamation accessibles aux salariés. Ensuite, l'importance donnée à l'ancienneté dans les contextes de syndicalisation induit un risque de sur-investissement en capital humain spécifique qui peut nuire à l'économie en diminuant le capital humain non-spécifique disponible et en limitant la mobilité du facteur travail. La diminution de la rotation du personnel serait donc en partie artificielle. Addison présente également des études qui indiquent que les entreprises où des syndicats sont présents ont en général une rentabilité du capital inférieure à celle des entreprises n'ayant pas de représentation salariale. Ainsi, s'il y a une hypothétique augmentation de productivité, elle doit être inférieure à l'augmentation des salaires, ce qui explique l'attitude hostile des employeurs lors des élections de certification des syndicats. Enfin, l'auteur pointe du doigt l'incapacité des études empiriques à déterminer les facteurs qui expliqueraient le supposé effet mélioratif des syndicats sur la productivité. Il énonce aussi des critiques méthodologiques de ces études empiriques. L'utilisation fréquente d'indicateurs de valeur ajoutée en unité monétaire confond effet prix et effet sur la productivité. Si les syndicats augmentent les salaires, les entreprises peuvent tenter de compenser la baisse de rentabilité du capital par une augmentation des prix de vente, ce qui augmente mécaniquement la valeur ajoutée. Cette critique prend toute son importance dans les études réalisées sur des données où les entreprises ont un pouvoir de marché. Enfin, Addison suggère que les études souffrent de biais de variables omises en ne contrôlant pas bien la qualité du facteur travail et la qualité du management et qu'il faudrait limiter les études à des échantillons d'entreprises comparables en termes de nature des tâches et de particularité des emplois.

Sur données françaises, [Coutrot, 1996] montre que, sur l'année 1992, l'effet des syndicats sur la productivité est non significativement différent de zéro.

Les avis des multiples auteurs sont donc très contrastés sur l'effet réel des syndicats sur la productivité. [Doucouliagos and Laroche, 2003] proposent une méta-analyse internationale afin d'exploiter la richesse des études empiriques existantes. Ils concluent que l'effet des

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syndicats sur la productivité est en moyenne nulle mais que cela cache des disparités temporelles, géographiques et sectorielles.

Les mesures de productivité dérivées de l'estimation de fonctions de production déterminent en réalité la productivité du travail pour un niveau d'intensité capitalistique donné car les modèles incluent naturellement le stock de capital ou l'intensité capitalistique en variable de contrôle. Les estimateurs de productivité relatifs à la présence syndicale sont ainsi biaisés vers le haut si les syndicats diminuent l'intensité capitalistique. L'effet subséquent sur la rentabilité est négatif si les investissements non réalisés sont à valeur actuelle nette positive. Dans les années 1990 s'est donc développée la littérature sur l'effet des syndicats sur l'investissement des entreprises, à la suite des modélisations proposées par [Baldwin, 1983, Grout, 1984, Grout, 1985]. Les syndicats ne se limitent pas à capter des rentes de monopole, ils captent également des rentes liées aux investissements, lesquelles correspondent pourtant à une part de la rentabilité normale attendue ajustée par le risque. En effet, lorsque des investissements sont nécessaires, les apports y afférents réalisés par les associés ou actionnaires sont rémunérés grâce aux surplus économiques liés à ces investissements. Les syndicats savent qu'une fois ces investissements réalisés, les entreprises n'ont aucun intérêt à fermer une unité de production tant que les revenus dégagés sont supérieurs aux coûts. Ainsi, les syndicats, agissant en monopole d'emploi, peuvent capter une part des rentes liées aux investissements. Évidemment, les associés ou actionnaires n'attendent pas une rentabilité nulle mais une rentabilité ajustée par le risque égale à celle que le marché peut offrir. Ce phénomène de captation des rentes liées aux investissements est donc largement concentré sur les investissements spécifiques de long-terme, puisqu'il existe pour les syndicats une opportunité temporelle de captation de ces rentes et qu'il n'existe aucune option de désinvestissement en l'absence de marché secondaire. En capturant une part de ces profits normaux, les syndicats diminuent l'investissement [Odgers and Betts, 1997]. Cependant, les entreprises pourraient également être incitées, au contraire, à innover et à substituer du capital au travail. Cette logique est toutefois limitée car ce n'est pas tant le nombre de salariés qui induit leur capacité de captation des rentes mais leur capacité de blocage de la production. Les études empiriques montrent largement que l'effet de sous-investissement domine, et qu'il est concentré dans les actifs spécifiques à long-terme tels que la R&D et la publicité [Hirsch, 1990, Hirsch,



1992, Bronars and Deere, 1993, Bronars et al., 1994].

**La rentabilité** L'analyse des effets des syndicats sur les salaires et la productivité amène naturellement tout chercheur en finance à s'interroger sur l'effet des syndicats sur la rentabilité du capital. Les deux effets se compensent-ils comme dans l'étude de [Brown and Medoff, 1978] ou l'augmentation de la productivité est-elle insuffisante pour compenser l'augmentation des salaires comme le soutient [Addison, 1982] ? L'accroissement des pressions concurrentielles peut également avoir rendu partiellement obsolète cette controverse. Si les syndicats n'augmentent plus les salaires, il n'y a plus à attendre d'eux qu'ils puissent augmenter la productivité pour que la rentabilité du capital ne soit pas diminuée.

L'étude de [Brown and Medoff, 1978] est la première étude empirique à suggérer que les syndicats n'ont pas d'effet négatif sur la rentabilité du capital, la compensation étant totale entre augmentation des salaires et de la productivité. [Karier, 1985] travaille sur les mêmes données que Brown et Medoff mais propose d'améliorer la stratégie d'identification. Il détermine que l'effet des syndicats sur les profits est négatif. Plus précisément, si les syndicats n'ont pas d'effet sur les profits dans les entreprises des secteurs non concentrés, les syndicats diminuent significativement les profits des entreprises des secteurs concentrés. Ainsi, l'effet principal des syndicats serait de redistribuer une partie des rentes de monopole aux salariés, conformément à la théorie de capture de rentes. Deux études empiriques précédentes avaient déjà mis en lumière cette particularité. [Freeman, 1983] montre, dans une étude empirique analysant la marge "prix-coût" et les rentes de monopole, que les syndicats ne diminuent les profits que dans les secteurs les plus concentrés, en capturant une part des rentes de monopole. [Salinger, 1984] utilise le "q" de Tobin pour mesurer le pouvoir de monopole de long-terme : il montre que les syndicats capturent l'essentiel des rentes de monopole et sont donc les premiers à profiter de la concentration de certains secteurs d'activité. Il y a donc un consensus sur le fait que les syndicats diminuent les profits et que cette diminution des profits est concentrée dans les secteurs où la concurrence est la moins intense. Ce consensus valide l'idée que la pression concurrentielle amoindrit considérablement la position de force des syndicats.

[Ruback and Zimmerman, 1984] analysent directement les cours de bourse et montrent que la valeur de marché d'une entreprise diminue lorsque l'élection d'un syndicat est prévue dans une entreprise et diminue encore davantage si le syndicat est élu. [Voos and Mishel, 1986] analysent l'effet de la couverture syndicale sur la marge "prix-coût" à l'aide d'un modèle d'équations simultanées afin de limiter l'endogénéité potentielle des études précédentes. Ils montrent que l'augmentation de la couverture syndicale est associée à une diminution de la marge "prix-coût". Les syndicats diminuent donc la rentabilité des entreprises. [Hirsch, 1991] utilise des données d'enquêtes sur la couverture syndicale dans 705 entreprises américaines dans les années 1970 et procède à une analyse de l'effet des syndicats sur le "q" de Tobin et sur la rentabilité du capital. Il détermine que la valeur de marché et les profits des entreprises ayant une couverture syndicale moyenne sont 10 à 15 % inférieurs à ceux d'une entreprise sans couverture syndicale. [Connolly et al., 1986] montrent également que la présence syndicale diminue la valeur des entreprises. Ils identifient les investissements en R&D, un actif spécifique de long-terme, comme étant un canal par lequel les syndicats captent des rentes.

[Metcalf, 2003] présente une revue de littérature sur le lien entre syndicats et rentabilité. Après avoir rappelé que l'effet des syndicats sur les profits résulte des effets conjoints des syndicats sur les salaires et la productivité, il affirme qu'il existe des preuves assez claires que les syndicats baissent les profits des établissements, des entreprises et des secteurs industriels où ils sont présents. Cependant, il admet que le monde est en train de changer et que l'effet négatif des syndicats sur la rentabilité est en train de disparaître. La combinaison de plusieurs facteurs permet d'expliquer cette tendance. Tout d'abord, la pression concurrentielle s'est intensifiée et les modifications institutionnelles ne sont pas allées dans le sens d'un renforcement de la position des syndicats. Ensuite, la masse salariale devient de plus en plus hétérogène, individualisant ainsi les trajectoires professionnelles, ce qui nuit à la cohésion du collectif des salariés. Enfin, la mise en place par les entreprises des "High Performance Work Practices", facilitée par la tertiarisation de l'économie, accompagne le processus d'affaiblissement du collectif des travailleurs par l'individualisation du rapport entre salariés et employeurs. Parallèlement, ces pratiques permettent à l'employeur de profiter du flux d'informations en provenance de la base et de salariés motivés.

Empiriquement, les études sur l'enquête anglaise WERS mettent bien en lumière ce phénomène. Alors que sur les millésimes 1980 et 1984 [Machin and Stewart, 1990] montrent que la couverture syndicale diminue significativement la rentabilité, [Bryson and Wilkinson, 2002] montrent sur le millésime 1998 que l'effet négatif précédemment documenté n'existe plus. [Menezes-Filho, 1997] confirment que l'effet négatif des syndicats sur la rentabilité a disparu pendant les années 1980. Si les syndicats diminuaient le bénéfice sur les ventes de 4 % en 1984, il n'y a plus aucun effet en 1990. [Batt and Welbourne, 2002] suggèrent que l'effet négatif des syndicats sur la rentabilité est en réalité le fruit d'un contexte historique, basé sur des oligopoles, une production standardisée de masse et des rapports conflictuels entre salariés et employeurs. Rien ne justifie que ce contexte perdure à l'avenir. En analysant les introductions en bourse de petites entreprises, ils montrent que les entreprises ayant des syndicats sont associées à un "q" de Tobin, un profit par action et un prix de l'action supérieurs de 10 à 17 %.

Dans une méta-analyse internationale d'études empiriques réalisées dans les années 1980 et 1990, [Doucouliagos and Laroche, 2009] montrent qu'un effet négatif des syndicats sur la rentabilité n'est observable qu'aux Etats-Unis, l'effet étant nul ailleurs dans le monde. Cet effet négatif aux Etats-Unis ne serait pas attribuable à la captation de rentes de monopole mais à celle de rentes liées aux actifs de long-terme, notamment les investissements en publicité qui sont des actifs spécifiques.

Enfin, sur données françaises, [Laroche, 2004] analyse des données de l'enquête REPONSE de 1998 et suggère que les syndicats en France n'ont pas d'effet significatif sur la rentabilité économique et financière. [Laroche and Wechtler, 2011, Bryson et al., 2011] montrent au contraire, sur le millésime 2004 de la même enquête, que la présence syndicale en France est associée à une rentabilité inférieure. Le premier chapitre de ce manuscrit, utilisant des données de 2009 à 2015, corrobore les seconds résultats : les syndicats ont un effet significativement négatif sur la rentabilité des entreprises en France.

**La réponse des entreprises à l'activité syndicale** Si les syndicats ont un effet sur les salaires et la productivité, il est attendu des directions des entreprises, en tant qu'agents des associés ou actionnaires, qu'elles tentent de minimiser les effets négatifs des syndicats

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et de profiter de leurs éventuels effets positifs. Ainsi, dans le cadre de la théorie des deux visages, les directions chercheront à diminuer la capacité des syndicats à augmenter les salaires par leur monopole d'emploi, conformément à la "Monopoly View", et elles viseront à développer un dialogue social de qualité afin de bénéficier d'une "collective voice" améliorant la productivité de l'entreprise. Combiner une augmentation de la productivité et une stagnation des salaires permettrait à la rentabilité d'augmenter grâce à la présence syndicale.

Le travail séminal de [Baldwin, 1983] développe une modélisation théorique afin d'expliquer les stratégies pouvant être mises en place par les directions des entreprises afin de neutraliser les effets négatifs des syndicats sur la rentabilité. Il examine en premier lieu la problématique de la captation des rentes liées aux investissements spécifiques à long-terme par les syndicats. La logique n'est pas nouvelle : [Simons, 1944] explique déjà comment dans le rapport de force entre capital et travail, le travail, selon lui la partie la plus flexible, peut capter les rentes issues des investissements de long-terme, ce qui diminue l'investissement et l'accumulation du capital. Afin d'empêcher les syndicats de capter ces rentes, c'est-à-dire augmenter les salaires, les employeurs peuvent décider d'adopter une stratégie d'investissement sous-optimale en termes macro-économiques. L'employeur décide volontairement de sous-investir dans quelques rares établissements afin de les rendre peu compétitifs et de créer ainsi un risque crédible de fermetures si les salaires venaient à augmenter. Par crainte sur l'emploi dans ces établissements, les syndicats ne demandent donc pas de revalorisation salariale au niveau de l'entreprise, les coûts liés aux pertes d'emploi étant supérieurs aux gains salariaux potentiels. Cette stratégie maximise la valeur pour l'actionnaire car le coût de maintien des rares établissements peu compétitifs est inférieur aux coûts liés à l'éventuelle augmentation salariale dans l'intégralité des établissements. Le coût de cette stratégie de neutralisation des syndicats croît avec le niveau des sur-profits de l'entreprise. Si ces derniers sont élevés, les gains salariaux potentiels sont élevés pour les syndicats : il faudra donc que la menace sur l'emploi soit large, c'est-à-dire maintenir un pourcentage élevé d'établissements volontairement sous-éfficaces, ce qui représente un coût élevé. Cependant, cette stratégie est néfaste pour l'économie car elle rend le secteur moins compétitif, affaiblit sa croissance et réduit les incitations à innover.

Symétriquement, [Klein and Leffler, 1981] montrent que la situation de "hold-up" peut facilement être inversée, car les employés à capital humain spécifique sont vulnérables à des demandes excessives de la part d'un capital fortement mobile. Dans un tel cadre, les syndicats peuvent également avoir recours à des stratégies de neutralisation de l'opportunisme managérial. En mettant en place un système de rémunération à l'ancienneté, ils peuvent offrir une prime aux salariés qui, par leur temps de présence dans l'entreprise, accumulent le plus de capital humain spécifique à l'entreprise. En effet, ce capital humain spécifique peut affaiblir la mobilité des salariés sur le marché du travail. Chaque partie ajuste donc ses réponses en fonction du contexte et du rapport de force présent.

[Baldwin, 1983] examine également d'autres stratégies de neutralisation des syndicats : la contractualisation, la dette, la participation aux bénéficiaires, et l'allongement de l'horizon temporel des salariés.

La contractualisation est le fait pour les représentants de l'entreprise et pour les syndicats de s'entendre par contrat sur une répartition de la valeur et de se soumettre à une procédure d'arbitrage par un tiers en cas de mésentente. Le problème est que cette solution souffre d'incohérence temporelle. En début de cycle, lorsque les investissements de long-terme sont réalisés, les associés ou actionnaires ont un intérêt à contractualiser mais les syndicats n'en ont pas. En fin de cycle, alors que les associés ou actionnaires ont déjà mis en place la stratégie optimale de sous-investissement, les syndicats ont alors un intérêt à contractualiser mais plus les associés ou actionnaires. De plus, les comportements opportunistes peuvent apparaître à chaque terme du contrat.

Baldwin admet que l'utilisation de l'endettement est plus aisée pour les employeurs car le choix du levier financier est une décision unilatérale de leur part. L'objectif est de faire peser une crainte raisonnable de défaut de paiement des intérêts ou du remboursement du capital des dettes financières. Les coûts de faillites, entendus comme la combinaison de la probabilité de faillite et des coûts réels de la faillite, sont en partie supportés par les salariés car la perte d'emploi est coûteuse (perte de revenus, coût de recherche d'un nouvel emploi, coûts psychologiques et sociaux, coût de mobilité géographique, perte du capital humain spécifique). Si les syndicats sont rationnels, ils ne demanderont pas d'augmentation des salaires au-delà du seuil où l'augmentation des salaires a une valeur

inférieure à l'augmentation des coûts de faillite supportés par les salariés, conformément à l'approche marginaliste. L'endettement permet, en augmentant ces coûts de faillite, de diminuer le seuil, limitant l'ampleur de la revendication salariale. [Bronars and Deere, 1991] développent également un modèle théorique autour de cette stratégie de neutralisation par l'endettement tout en l'accompagnant d'une validation empirique. La logique de leur modèle est que l'augmentation de l'endettement, en plus d'augmenter les coûts de faillite supportés par les salariés, réduit les flux de trésorerie futurs que les syndicats pourront capter. [Matsa, 2010] montre aussi que la réponse optimale d'une entreprise face à des syndicats est d'augmenter son taux d'endettement. Le bénéfice qui résulte de l'augmentation de l'endettement croît à la fois avec la force des syndicats présents et avec la volatilité des profits. Une variance élevée des profits expose les entreprises à un risque accru de capture de liquidités par les syndicats lors des années où les flux de trésorerie sont élevés. Matsa valide empiriquement son modèle sur des données américaines des années 1977, 1987 et 1999. [Klasa et al., 2009] montrent également qu'une entreprise détenant moins de liquidités améliore sa position de force vis-à-vis des syndicats lors des négociations salariales. L'augmentation des liquidités détenues est associée avec un accroissement des occurrences de grève, ce qui suggère que la détention de liquidités est perçue par les syndicats comme le signal d'une richesse à répartir. [Hamm et al., 2017] analysent le lien entre la volatilité des revenus déclarés et la valeur de la prime salariale syndicale. Ils associent la volatilité des profits à la notion de risque pour expliquer l'augmentation de la prime salariale syndicale dans les entreprises ayant une volatilité élevée de leurs résultats. Ces dernières sont perçues par les salariés comme présentant un risque plus élevé de défaut. Un salarié va donc demander une prime salariale afin d'accepter de prendre un risque de perte d'emploi accru [Abowd and Ashenfelter, 1981, Topel, 1984, Agrawal and Matsa, 2013]. Une stratégie permettant de limiter l'ampleur de cette prime d'assurance est donc de pratiquer un lissage des résultats comptables afin d'en diminuer la volatilité perçue. Les entreprises qui font face à des syndicats puissants ont d'autant plus d'incitations à pratiquer cette stratégie de neutralisation afin de limiter leur masse salariale. La théorie du risque de chômage semble contradictoire avec la théorie de l'arbitrage. En effet, la première théorie suggère que le risque lié à l'endettement oblige les entreprises à augmenter les salaires alors que la seconde théorie suggère qu'il permet aux entreprises de diminuer

les salaires en neutralisant les syndicats. [Perotti and Spier, 1993, Chemmanur et al., 2013] montrent que la relation entre risque et salaires est en réalité non monotone. La stratégie de neutralisation des syndicats par l'endettement ne fonctionne que lorsque deux critères cumulatifs sont satisfaits : la faillite est crédible et les coûts y afférents sont élevés pour les salariés. Dans les autres cas, les salariés demandent une prime d'assurance face à un risque potentiel et éloigné dans le temps.

[Chung et al., 2016] se concentrent sur un autre aspect de l'information financière : ils montrent que les entreprises affaiblissent la position de force des syndicats puissants en diminuant la fréquence de leur communication financière et en divulguant une image volontairement moins flatteuse de leur performance lors des périodes qui précèdent les négociations salariales. Ces résultats corroborent ceux de [Liberty and Zimmerman, 1986, DeAngelo and DeAngelo, 1991, Bova, 2013] : les entreprises manipulent l'information financière avant les négociations salariales afin d'affaiblir les syndicats car ces derniers utilisent l'information financière pour connaître leur marge de négociation et donc leur position de force vis-à-vis de l'employeur. Cette manipulation peut prendre la forme de discours volontairement moins optimistes sur la performance et de manipulations du résultat comptable afin de le réduire et de rater volontairement des cibles de résultat.

[Baldwin, 1983] analyse également l'alignement des intérêts entre salariés et associés ou actionnaires au travers de deux stratégies de neutralisation : la participation au bénéfice et l'allongement de l'horizon temporel des salariés. Ces stratégies ne sont intéressantes que si l'effet relatif sur la productivité et les salaires augmente la rentabilité. Dans son cadre théorique, Baldwin montre que la stratégie de participation des salariés aux bénéfices de l'entreprise permet l'augmentation de la productivité. Cependant, la participation aux bénéfices ne permet d'éviter la stratégie de sous-investissement que si les salariés détiennent 100 % du capital de l'entreprise car les salariés ont toujours une incitation à exproprier le moindre associé ou actionnaire non salarié par l'augmentation des salaires. De plus, dès que les salariés ont suffisamment de droits de vote pour contrôler l'entreprise, il est attendu que la politique salariale soit utilisée pour exproprier les associés ou actionnaires non-contrôlants, en augmentant les salaires à leurs dépens. Cette idée est analysée empiriquement par [Agrawal, 2012] qui étudie le comportement des fonds de pension gérés

par le syndicat AFL-CIO. Il montre ainsi que le comportement de vote des responsables des fonds AFL-CIO n'est pas le même si l'AFL-CIO représente ou ne représente pas de salarié au sein de l'entreprise. Les fonds AFL-CIO sont beaucoup moins opposés aux directions des entreprises où l'AFL-CIO ne représente aucun salarié. Par ailleurs, les résultats suggèrent que la présence conjointe de l'AFL-CIO comme actionnaire et comme représentant des salariés bénéficie aux employés au détriment des actionnaires. Les actionnaires qui sont affiliés à une organisation représentant les salariés n'ont donc pas comme objectif unique la maximisation de la valeur actionnariale. Par ailleurs, plus le pourcentage de droits de vote de ces actionnaires augmente, plus le transfert de valeur des actionnaires aux salariés est fort. Ainsi, à moins que l'objectif soit que l'entreprise soit détenue à 100 % par ses salariés, les associés ou actionnaires doivent éviter que les salariés n'acquièrent suffisamment de droits de vote pour pouvoir influencer sur la gestion de l'entreprise. En pratique, les accords d'intéressement permettent d'atteindre cet objectif. Un autre moyen d'aligner les intérêts entre salariés et associés ou actionnaires est l'allongement de l'horizon temporel des salariés. L'alignement des intérêts est obtenu en intéressant les salariés à la performance de l'entreprise au moment où ils la quittent. Baldwin évoque l'idée de permettre aux salariés de vendre leur poste au moment de leur départ, ce qui leur procure une prime dont la valeur permet de diminuer les salaires. Pour que cette stratégie soit viable, il suffit que le droit de travailler dans l'entreprise ait une valeur positive, c'est-à-dire que la somme des valeurs actualisées de la prime payée, du différentiel de salaire entre l'entreprise et le marché, et de la prime reçue lors du départ soit positive. Dans le cadre théorique de Baldwin la prime payée et à recevoir ont les mêmes valeurs actuelles. Il faut donc que le salaire de l'entreprise soit supérieur au salaire de marché, ce qui suppose l'existence de rentes. En faisant supporter aux salariés un coût de faillite plus élevé, par la perte potentielle de leur prime de départ, la stratégie limite la captation de rentes de la part des syndicats et donne aux salariés une incitation à coopérer pour améliorer la performance de l'entreprise afin qu'elle soit toujours attractive lors de leur départ.

[Matsa, 2010] propose également l'accroissement des stocks comme mesure de neutralisation des syndicats. En augmentant les stocks, particulièrement les stocks de produits finis, les entreprises minimisent le coût d'un éventuel arrêt de la production consécutif à une grève. Matsa valide empiriquement cette proposition de manière toutefois limitée. Cette idée est



déjà présente chez [Christenson, 1953] qui l'envisage de manière plus large. Il analyse les conséquences des grèves sur la production et les différents facteurs de compensation dont les entreprises disposent pour limiter l'effet négatif des grèves. Il développe la théorie des facteurs de compensation. Le premier facteur de compensation est celui du transfert actuel qui consiste à transférer la production sur d'autres sites lorsqu'elle est bloquée dans une usine. Les autres facteurs de compensation sont liés à la variable temporelle et peuvent être *ex ante* ou *ex post*. Le blocage d'une usine peut être compensé *ex ante* par des stocks ou *ex post* par une augmentation de la production de l'usine bloquée après son déblocage. Tous les facteurs de compensation nécessitent d'avoir, à un moment donné, une capacité de production excédentaire, ce qui représente un coût. Le facteur de compensation par décalage temporel ex-ante engendre également des coûts supplémentaires liés au stockage. Le coût des stratégies de neutralisation par facteurs de compensation doit donc être mis en balance avec le coût d'une grève et des concessions financières et non financières subséquentes.

Enfin, la meilleure réponse des entreprises face à la représentation salariale peut être d'empêcher son apparition ou de faciliter sa disparition. D'une part, les employeurs peuvent rendre plus coûteuse pour les salariés la présence d'un syndicat, en gênant le processus d'élection, en menaçant les employés de représailles sur leur salaire ou leur emploi en cas d'installation d'un syndicat, ou au contraire en leur promettant une meilleure situation en cas de cessation du syndicat. Ils peuvent d'autre part décourager les salariés de vouloir être représentants syndicaux. La première stratégie est difficile car la plupart des pays ont mis en place des institutions limitant la capacité des employeurs de nuire au processus de représentation et à l'activité syndicale. Aux Etats-Unis, les pratiques déloyales que les employeurs mettent en place peuvent être signalées par les salariés au National Labor Relations Board (NLRB) qui est doté de pouvoirs de coercition. En France, l'absence d'organisation des élections professionnelles et les autres pratiques déloyales constituent des délits d'entrave donnant lieu à des sanctions pénales. Les autres pays développés ont également des systèmes institutionnels comparables qui garantissent le processus d'installation et les activités des syndicats. La seconde stratégie est plus difficile à repérer et donc à sanctionner. En effet, dans de nombreux pays, les représentants syndicaux sont également des salariés de l'entreprise. Pour qu'un syndicat soit présent dans une

entreprise, il faut que des salariés prennent la décision d'être représentants syndicaux. Si les représentants syndicaux sont discriminés, en termes de salaires ou de promotions, et qu'ils en ont conscience, alors la probabilité d'existence d'un syndicat diminuera. [Breda, 2014, Bourdieu and Breda, 2016] montrent qu'en France les représentants syndicaux ont un salaire inférieur de 10 % à leurs collègues et qu'un représentant syndical sur deux en a conscience. Enfin, la réponse des entreprises à la présence des syndicats peut être altérée par la problématique d'agence entre les associés ou actionnaires et les dirigeants. Dans les entreprises où les mécanismes d'alignement des intérêts des associés ou actionnaires et des dirigeants ne sont pas correctement mis en place, les dirigeants peuvent, au lieu de mettre en place les stratégies sus-citées, rentrer en collusion avec les salariés et leurs représentants afin de profiter d'une vie plus douce [Bertrand and Mullainathan, 2003].

## Contexte institutionnel

En France, la liberté syndicale a d'abord été reconnue par la loi, grâce aux lois Ollivier en 1864 et Waldeck-Rousseau en 1884 qui, respectivement, suppriment le délit de coalition institué par la loi Le Chapelier de 1791 et autorisent la mise en place des syndicats et fixent leurs domaines de compétence. Ces lois ont été ensuite reprises dans le préambule de la Constitution de 1946 ce qui permet actuellement à la liberté syndicale de faire partie du bloc de constitutionnalité. La légitimité des syndicats en France repose sur un processus de reconnaissance de représentativité. De manière similaire au processus de certification qui peut exister dans les pays anglo-saxons, un syndicat ne peut représenter un ensemble de salariés que s'il est reconnu représentatif de cet ensemble. Les conditions actuelles de représentativité des syndicats permettent de garantir une cohérence entre les préférences des salariés et leur représentation effective. Depuis la loi du 20 août 2008 qui a supprimé la présomption irréfutable de représentativité, la représentativité d'un syndicat s'appuie sur sept critères : le respect des valeurs républicaines, l'indépendance vis-à-vis de l'employeur et des mouvements politiques et religieux, la transparence financière, une ancienneté d'au moins deux années dans le champ de la négociation, une influence (ce qui signifie une réelle activité de défense des intérêts des travailleurs), un effectif d'adhérents et un niveau

de cotisations, et une audience (c'est-à-dire être soutenu par les salariés que le syndicat entend représenter). Ce dernier critère est le plus discriminant car il fait obligation au syndicat d'avoir un soutien significatif de la part des salariés. L'audience est déterminée par le vote des salariés au profit du syndicat au cours du premier tour des élections professionnelles au comité d'entreprise ou, à défaut, à la délégation du personnel. Les élections professionnelles doivent avoir lieu au moins tous les quatre ans afin d'actualiser l'audience de chaque syndicat et ainsi affirmer, confirmer ou infirmer leur représentativité.

Il existe plusieurs niveaux de représentativité : l'établissement, l'entreprise, le groupe, la branche professionnelle et le niveau national. Pour être représentatif au niveau d'un établissement, d'une entreprise ou d'un groupe, un syndicat doit recueillir une audience minimale de 10 %, c'est-à-dire obtenir 10 % des votes émis, quel que soit le nombre de salariés votants. Pour obtenir une représentativité au niveau d'une branche professionnelle ou au niveau national, l'audience minimale doit être de 8 %. La représentativité dans un niveau permet de négocier des conventions ou des accords collectifs à ce niveau uniquement. Dans les entreprises multi-établissements, l'audience se calcule au niveau de chaque établissement lors des élections des comités d'établissement. Puis au niveau de l'entreprise, l'audience d'un syndicat se calcule par l'addition de l'ensemble des suffrages obtenus dans l'ensemble des établissements, quel que soit le pourcentage qu'il a obtenu par établissement. Si l'entreprise est membre d'un groupe, au sens d'ensemble d'entreprises contrôlées par une société mère, l'audience de chaque syndicat au niveau du groupe sera déterminée par l'agrégation des résultats des élections dans chaque entreprise du groupe, à l'instar de l'agrégation des résultats des élections dans les entreprises multi-établissements. Pour l'audience au niveau de chaque branche professionnelle et au niveau national, le même principe d'agrégation des résultats des élections des entreprises a lieu pour déterminer les audiences de chaque syndicat. Ainsi, si l'entité de base pour la détermination de la représentativité est l'établissement, un processus itératif d'agrégation permet de déterminer les audiences et donc la représentativité syndicale dans les niveaux supérieurs.

L'adhésion aux syndicats en France est très faible. Dans le secteur privé, le taux d'adhésion syndicale, ou taux de syndicalisation, est environ de 7 %. Cette faible adhésion vient du contexte institutionnel : l'adhésion à un syndicat est payante alors même que le

bénéfice des négociations collectives profite à tous les salariés, adhérent ou non, ce qui justifie économiquement que la majorité des salariés fasse le choix de ne pas adhérer à un syndicat. Par ailleurs, une jurisprudence de la chambre sociale de la Cour de Cassation, par une décision du 29 février 2012, considère que le respect des critères que sont l'effectif d'adhérents et le niveau de cotisations doit être apprécié globalement avec le respect des critères d'influence, d'ancienneté (dès lors qu'elle est au moins égale à deux années) et d'audience (dès lors qu'elle est supérieure au seuil de représentativité) et doit tenir compte du taux d'adhésion syndicale moyen des salariés de l'entreprise. Ainsi, il est improbable que le nombre d'adhérents soit à lui seul un frein à la représentativité d'un syndicat qui aurait une audience suffisante. Le contexte institutionnel ne donne donc aucune raison aux salariés d'adhérer à un syndicat.

Par ailleurs, la capacité à mener à terme des négociations collectives dépend exclusivement du critère d'audience, c'est-à-dire des résultats de chaque syndicat aux élections. En effet, comme plusieurs syndicats peuvent être reconnus représentatifs pour un même ensemble de salariés, contrairement aux systèmes de représentation anglo-saxons, les résultats aux élections servent également à définir la capacité de chaque syndicat à conclure des conventions ou des accords collectifs. Afin de pouvoir conclure un accord collectif, un syndicat représentatif, ou une coalition de syndicats représentatifs, doit réunir au minimum 30 % des voix aux élections. Par ailleurs, un syndicat représentatif, ou une coalition de syndicats représentatifs, peut s'opposer, s'il ou elle a réuni la majorité des voix aux élections, à la conclusion d'un accord par d'autres syndicats représentatifs. Les pourcentages de votes reçus aux élections sont donc capitaux pour les syndicats car ils déterminent directement leur capacité à agir, seuls ou de concert, dans tous les champs de la négociation collective.

Ces règles institutionnelles continuent d'alimenter une critique infondée sur la légitimité des syndicats au seul regard du taux d'adhésion. La légitimité des syndicats tient au taux de participation au premier tour des élections professionnelles qui a été, au niveau national, de 42,78 % pour le cycle 2009-2012 et de 42,76 % pour le cycle 2013-2016<sup>2</sup>, ce qui est comparable au taux de participation de 48,7 % du premier tour des élections législatives de 2017.<sup>3</sup> Par ailleurs, même si le taux d'adhésion est faible, le nombre d'adhérents des

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<sup>2</sup><https://www.elections-professionnelles.travail.gouv.fr/web/guest/resultats>

<sup>3</sup><https://www.interieur.gouv.fr/Elections/Les-resultats/Legislatives>

principales confédérations syndicales reste largement supérieur au nombre d'adhérents des principaux partis politiques à adhésion payante. Le nombre d'adhérents déclarés par chacune des trois principales confédérations était<sup>4</sup>, en moyenne sur la période 2009-2015, de 836 161 à la CFDT, de 702 564 à la CGT et de 733 333 à la CGT-FO, tandis que celui des principaux partis politiques à adhésion payante était, en 2017, de 235 000 pour Les Républicains, de 120 000 pour le Parti Socialiste et de 80 000 pour le Front National. Ainsi, la légitimité des syndicats français ne devrait pas être davantage remise en question que celle de l'Assemblée nationale et des partis politiques.

Les salariés d'un établissement sont donc soumis à des accords conclus entre l'entreprise, ou une organisation patronale à laquelle l'entreprise est adhérente, et des syndicats représentatifs à différents niveaux de négociation. Ils sont même soumis à des accords dont leur entreprise n'est pas signataire par le biais de la procédure d'extension qui permet, sur décision du ministère du Travail, d'étendre l'obligation d'appliquer un accord national ou de branche à toutes les entreprises du champ professionnel concerné, même si elles ne sont pas adhérentes à l'une des organisations patronales signataires.

Par ailleurs, deux catégories de syndicats co-existent, les syndicats non catégoriels et les syndicats catégoriels. La distinction entre les deux types de syndicats se forme lors de l'établissement des statuts légaux des syndicats qui imposent de définir la ou les catégorie(s) de salariés que le syndicat aura pour objet de représenter. Si la majorité des syndicats ont décidé d'avoir pour objet de représenter l'ensemble des salariés, certains syndicats ont fait le choix de ne chercher à représenter que le personnel d'encadrement afin de répondre aux attentes spécifiques de ces salariés. En 1944 a été fondée la Confédération générale des cadres (CGC), aujourd'hui Confédération française de l'encadrement - Confédération générale des cadres (CFE-CGC), qui regroupe la majorité de ces syndicats catégoriels représentant le personnel d'encadrement. Pour les syndicats catégoriels de l'encadrement, les seuils minimaux d'audience afin d'obtenir la représentativité se calculent à partir des seuls votes émis par les salariés appartenant aux positions d'emploi concernées par ces syndicats. La confédération, la fédération et l'union sont des structures couramment utilisées par les syndicats pour se regrouper et former un ensemble de taille critique

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<sup>4</sup>ETUC Annual Gender Equality Survey 2018 "11<sup>th</sup> Edition", European Trade Union Institute

suffisante pour mutualiser des moyens et obtenir une représentativité de branche ou nationale. Actuellement, les cinq syndicats représentatifs au niveau national sont des confédérations : la CGT, la CFDT, la CGT-FO, la CFE-CGC et la CFTC. A ces cinq confédérations représentatives sur le plan national viennent s'ajouter deux groupements de syndicats de taille notable ayant préférés former des unions pour privilégier l'autonomie de leurs membres : l'Union syndicale Solidaires et l'UNSA. Les syndicats choisissant de ne pas appartenir à un groupement (union, confédération ou fédération) sont appelés syndicats indépendants et ceux limitant leur activité à une seule entreprise sont appelés syndicats "maison". Enfin, parmi les grands groupements de syndicats, un partitionnement politique existe. Si la CGT et l'Union syndicale Solidaires préconisent la lutte des classes et le rapport de force avec les directions des entreprises, les organisations patronales et les gouvernements, la CFDT et la CFTC prônent un syndicalisme de dialogue acceptant l'économie de marché et ses contraintes. La CGT-FO navigue entre ces deux voies au gré des sensibilités de ses secrétaires généraux et la CFE-CGC déclare publiquement avoir un positionnement intermédiaire entre la ligne dure de la CGT et la ligne auto-proclamée réformiste de la CFDT.

## Présentation des travaux de recherche

### Multi-syndicalisme et rentabilité des entreprises

Le premier chapitre de cette thèse examine la relation entre le nombre de syndicats dans une entreprise et sa rentabilité. Si depuis longtemps le lien entre présence syndicale et niveau des salaires a été mis en lumière [Lewis, 1963, Lewis, 1983, Jarrell and Stanley, 1990], la prime salariale syndicale semble sur le déclin [Stewart, 1990, Stewart, 1995, DiNardo and Lee, 2004, Coutrot, 1996, Breda, 2015]. Les études sur la tendance des syndicats à diminuer ou à accroître la création de la valeur ont montré des résultats mitigés [Pencavel, 1977, Brown and Medoff, 1978, Addison, 1982] qui cachent des disparités géographiques, temporelles et sectorielles [Doucouliagos and Laroche, 2003]. Sur données françaises, [Coutrot, 1996] ne trouve pas d'effet significatif des syndicats sur la productivité mais un effet positif sur les salaires. Cet effet salarial est également identifié par [Breda, 2015].

Si le taux de couverture des salariés par la représentation syndicale a été longuement analysé sur données américaines, le nombre de syndicats n'y a pas été abordé. Cette absence de prise en compte de la diversité syndicale est peu étonnante car les données américaines ne permettent pas d'identifier les syndicats présents dans une entreprise à un instant donné. Dans la quasi-totalité des études, la représentation syndicale reste donc une boîte noire. Les très rares études sur le multi-syndicalisme, c'est-à-dire la présence de plusieurs syndicats, ont été menées sur la base d'enquêtes réalisées au niveau des établissements, principalement à partir de l'enquête WERS en Angleterre, ce qui limite l'étendue des investigations et donc des conclusions, car l'utilisation de données financières au niveau des entreprises est rendue impossible. Dans ce chapitre, une base de données sur la présence des syndicats au niveau de l'entreprise, la base ACEMO-DSE, produite par la DARES du ministère du Travail, a pu être appareillée avec une multitude de bases financières et comptables et avec la base de données DADS, produite par l'INSEE du ministère de l'Économie et des Finances, qui fournit des informations sur les salaires de tous les employés français. Par ailleurs, les multi-syndicalismes français et anglais ne sont pas identiques car des différences institutionnelles existent. En Angleterre, chaque syndicat, au sein d'une entreprise, représente un groupe différent de salariés partageant une communauté d'intérêt (bargaining unit). Le multi-syndicalisme anglo-saxon se caractérise par un choix laissé à chaque syndicat : négocier seul avec l'employeur au bénéfice du groupe de salariés représentés ou négocier conjointement avec un ou plusieurs autres syndicats pour revendiquer une position commune au bénéfice de l'ensemble des groupes de salariés représentés par les syndicats coalisés. Que la négociation soit séparée ou conjointe, chaque syndicat a un intérêt à ce que son groupe de salariés y gagne, éventuellement au détriment des autres groupes. Le multi-syndicalisme français se caractérise lui par la nécessité d'avoir une audience suffisante, seul ou conjointement avec d'autres syndicats, afin de pouvoir signer ou s'opposer à des accords collectifs. Par ailleurs, dans le système français, contrairement aux systèmes anglo-saxons, tous les syndicats représentatifs, à l'exception des rares syndicats catégoriels, négocient pour le bénéfice de l'ensemble des salariés, ce qui est susceptible de limiter les comportements opportunistes de la part des syndicats. Enfin, l'analyse de l'effet sur la rentabilité du nombre de syndicats présents dans l'entreprise permet également d'élargir l'analyse à l'effet particulier de chaque syndicat. Certains

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syndicats se trouvent plus fréquemment que d'autres dans les entreprises et comme les effets de chacun des syndicats sur la rentabilité ne s'additionnent pas, l'analyse des effets d'un syndicat en particulier sur la rentabilité ne peut pas se réaliser sans contrôler le nombre de syndicats dans l'entreprise afin de limiter le biais de variables omises. Ces différences d'approche méthodologique et ces différences contextuelles justifient les travaux de ce chapitre.

Ce premier chapitre cherche à déterminer si le multi-syndicalisme a un effet sur la rentabilité des entreprises et, le cas échéant, par quels canaux cet effet prend forme. La rentabilité, approchée par le ratio de l'earnings before interest and taxes (EBIT) sur le total de l'actif net, est la conséquence directe de la capacité de l'entreprise à créer de la valeur ajoutée et de sa propension à la redistribuer à ses salariés. Les hypothèses de recherche visent donc l'effet du multi-syndicalisme sur la capacité de l'entreprise à créer de la richesse et sur la répartition de cette richesse entre les salariés et les autres parties prenantes. Si un syndicat augmente les salaires, le multi-syndicalisme peut soit renforcer soit affaiblir cette tendance, selon que la présence de plusieurs syndicats crée une concurrence incitant les syndicats à mieux répondre aux attentes des salariés ou dilue leur pouvoir en multipliant les interlocuteurs, les objectifs et les contradictions au sein de la représentation salariale. Parallèlement, un syndicat peut diminuer ou augmenter la valeur ajoutée créée par l'entreprise en fonction de la qualité du dialogue social, et le multi-syndicalisme peut soit améliorer soit détériorer le dialogue social, selon qu'il induit une radicalisation de chaque syndicat ou permet au contraire d'éviter un monopole syndical nuisible.

Le résultat principal de ce chapitre est que la rentabilité est plus faible dans les entreprises ayant plusieurs syndicats que dans les entreprises n'ayant qu'un seul syndicat, ces dernières étant elles-mêmes moins rentables que les entreprises sans représentation salariale. Le résultat est confirmé à la fois sur un sous-échantillon d'entreprises comparables construit sur la base d'un propensity-score matching et en réalisant une analyse à base de variables instrumentales. Plus précisément, les résultats montrent que si le premier syndicat diminue la rentabilité de l'entreprise en diminuant sa capacité à créer de la valeur, les syndicats subséquents diminuent la rentabilité en augmentant les salaires davantage qu'ils n'augmentent la valeur créée.



Ce chapitre montre également que si la rentabilité baisse avec le premier syndicat, elle baisse encore avec le second syndicat, puis se stabilise. Des investigations complémentaires montrent que la rentabilité ne baisse en présence de plusieurs syndicats que si l'un des syndicats s'avère être la CGT, un syndicat revendicatif. La CGT étant présente dans la majorité des entreprises ayant plusieurs syndicats, l'effet négatif du multi-syndicalisme sur la rentabilité s'avère en réalité dû à la mauvaise cohabitation entre la CGT et les autres syndicats, cette cohabitation induisant une baisse de création de valeur par l'entreprise. De plus, ce chapitre montre que la prime salariale syndicale augmente avec le nombre de syndicats, et s'accroît pour chaque syndicat additionnel dans l'entreprise. Ce résultat est intéressant car il contredit l'idée que le multi-syndicalisme diviserait les forces salariales et amoindrirait la capacité de négociation des syndicats. Plus il y a de syndicats, plus la concurrence entre eux semble, au contraire, les inciter à obtenir davantage de concessions salariales. Enfin, ce chapitre éclaire les éventuels bienfaits sociétaux des syndicats représentant le personnel d'encadrement. Par rapport aux autres syndicats, la CFE-CGC est significativement associée à une création de richesse plus élevée ainsi qu'à de meilleurs salaires. Toutefois, les augmentations de salaire liées à la présence de ce syndicat sont concentrées sur les salariés ayant les meilleures rémunérations, ce qui crée une nouvelle source d'inégalités salariales au sein de l'entreprise.

Ce chapitre contribue à quatre champs de la littérature. Premièrement, il contribue à la littérature sur la prime salariale syndicale [Lewis, 1963, Lewis, 1983, Duncan and Stafford, 1980, Jarrell and Stanley, 1990, Stewart, 1990, Stewart, 1995, Card, 1996, DiNardo and Lee, 2004, Firpo et al., 2009] en montrant qu'en France, sur la période 2009-2015, les syndicats sont toujours capables d'obtenir des concessions salariales, que ces primes salariales augmentent avec le nombre de syndicats dans l'entreprise et qu'elles varient en fonction des syndicats présents dans l'entreprise et de la position de l'employé dans la distribution des salaires. Deuxièmement, il contribue aux littératures sur l'effet du syndicalisme sur la productivité [Pencavel, 1977, Brown and Medoff, 1978, Addison, 1982, Coutrot, 1996, Doucouliagos and Laroche, 2003] et sur la rentabilité des entreprises [Freeman, 1983, Salinger, 1984, Ruback and Zimmerman, 1984, Voos and Mishel, 1986, Hirsch, 1991, Connolly et al., 1986, Menezes-Filho, 1997, Doucouliagos and Laroche, 2009, Laroche and Wechtler, 2011]. En analysant à la fois rentabilité, productivité et salaires dans

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le même travail empirique et sur les mêmes observations, ce chapitre démêle l'origine de l'effet des syndicats sur la rentabilité en identifiant l'effet sur les salaires et l'effet sur la productivité. Ce chapitre montre qu'un syndicat unique diminue la rentabilité en diminuant la productivité tandis que le multi-syndicalisme diminue la rentabilité car l'augmentation des salaires est trop importante par rapport à l'augmentation de la productivité. Troisièmement, en montrant que l'effet négatif du multi-syndicalisme sur la rentabilité est lié à la présence conjointe d'un syndicat revendicatif, la CGT, et d'autres syndicats, ce chapitre contribue à la littérature sur le dialogue social et ses conséquences sur la rentabilité des entreprises. Alors que les articles sur données anglaises montrent que, dans les établissements où les syndicats décident de ne pas négocier conjointement, les responsables perçoivent la performance comme plus faible [Ingram et al., 1993, Machin et al., 1993, Pencavel, 2004], ce chapitre montre plus directement, et en utilisant une mesure non subjective de la performance, que des différences idéologiques trop fortes entre les syndicats ont un effet négatif sur la rentabilité des entreprises. Pour finir, en analysant l'effet marginal de chaque syndicat additionnel sur la rentabilité, la productivité et les salaires, ce chapitre contribue à un nouveau champ de la littérature sur les effets du syndicalisme.

## **Syndicats, lissage de résultat, et rentabilité des entreprises**

Le second chapitre de cette thèse examine les interactions entre la présence syndicale et la pratique de lissage des résultats. Cette dernière vise à influencer la manière dont les parties prenantes perçoivent la performance et le risque associé à l'activité de l'entreprise. L'idée est d'une part de déterminer si la présence syndicale modifie la propension des entreprises à engager des pratiques de lissage et d'autre part d'analyser si ces pratiques de lissage affectent la capacité des syndicats à obtenir des concessions salariales. Les résultats financiers sont des informations et des signaux permettant d'analyser la création de valeur par l'entreprise. Les syndicats sont naturellement intéressés par la répartition de cette valeur. Sous contrainte de survie de l'entreprise, qui est capitale pour conserver l'emploi, les syndicats cherchent à faire profiter les salariés au maximum de la valeur créée par l'entreprise en demandant des augmentations de salaires si cela leur semble possible compte

tenu des informations disponibles. Plus la valeur créée est perçue comme importante et pérenne, plus les syndicats sont convaincus de la capacité de la direction de l'entreprise à répondre à leur demande et mettent éventuellement en place des actions pour obtenir des concessions salariales. En situation d'asymétrie d'information, le contenu informationnel et le contenu de signal des résultats financiers servent donc de base aux parties prenantes pour situer leur capacité à négocier. La pratique de gestion des résultats afin d'influencer la perception de la performance des entreprises par les autres parties prenantes est largement documentée [Trueman and Titman, 1988, Hayn, 1995, Burgstahler et al., 2006, Degeorge et al., 1999, Graham et al., 2005, Roychowdhury, 2003]. La gestion des résultats peut servir à influencer des investisseurs [Roychowdhury, 2003], des partenaires bancaires [Jiang, 2008], des fournisseurs [Raman and Shahrur, 2008] ou des syndicats [Bova, 2013]. Par ailleurs, la capacité des parties prenantes à détecter la gestion des résultats est faible, y compris pour les parties prenantes les plus avisées tels les auditeurs et les investisseurs institutionnels [Bradshaw et al., 2001, Roychowdhury, 2003]. Le lissage des résultats est une technique de gestion des résultats qui vise à diminuer la volatilité de ces derniers. La baisse de volatilité des résultats, en améliorant le contenu informationnel des résultats [Chaney and Lewis, 1995, Subramanyam, 1996, Tucker and Zarowin, 2006], est associée à un risque perçu plus faible car elle signale la capacité et la confiance des dirigeants de l'entreprise dans le maintien d'un certain niveau de création de valeur [Kirschenheiter and Melumad, 2002]. Un résultat très volatile est associé à un risque important de l'activité car l'entreprise est perçue comme incapable de maintenir une activité stable et les résultats paraissent peu informatifs sur le futur de l'entreprise. Si le risque perçu est élevé, les syndicats sont enclins à demander une prime d'assurance sous la forme de salaires plus élevés pour couvrir le risque de perte d'emploi des salariés [Abowd and Ashenfelter, 1981, Topel, 1984, Agrawal and Matsa, 2013, Hamm et al., 2017]. Cependant, s'il existe un réel risque de défaillance de l'entreprise, la volatilité élevée peut être associée, au contraire, avec une baisse des salaires pour ne pas provoquer la défaillance et ses conséquences négatives en terme d'emploi [Perotti and Spier, 1993, Chemmanur et al., 2013]. A l'opposé, une volatilité des résultats très faible assure aux syndicats le caractère permanent des résultats, ce qui peut les inciter à augmenter leurs revendications salariales car il n'existe aucun risque sur l'emploi. Ainsi, l'association entre volatilité des résultats et pouvoir des syndicats reste une question

empirique.

Ce second chapitre explore d'une part l'effet de la présence syndicale sur l'intensité du lissage des résultats et d'autre part l'effet de ce lissage sur le montant de la prime salariale syndicale. Si une modification de la politique de lissage des résultats permet de neutraliser les syndicats et de réduire la masse salariale, alors il est attendu que les entreprises avec ou sans représentation syndicale n'aient pas les mêmes politiques de lissage des résultats. En outre, les entreprises n'ont pas toutes la même volatilité fondamentale de leurs profits, et la capacité de lissage, ou d'anti-lissage, est limitée par les contraintes réglementaires et économiques. Ainsi, le lien entre lissage des résultats et présence syndicale peut changer en fonction de la volatilité fondamentale des résultats de l'entreprise.

Les principaux apports de ce chapitre sont de montrer que si le lissage des résultats permet de diminuer la prime salariale syndicale, corroborant les résultats de [Hamm et al., 2017], ce phénomène est circonscrit aux seules entreprises ayant une volatilité élevée de leurs flux de trésorerie. Ces dernières n'intensifient toutefois pas leur pratique de lissage, contrairement aux suggestions de [Hamm et al., 2017]. Il est possible que les entreprises ayant des flux de trésorerie très volatiles lissent déjà au maximum leurs résultats, indépendamment de toute présence syndicale. Cette hypothèse est crédible car si le lissage des résultats dans les entreprises aux flux de trésorerie volatiles permet d'améliorer la position de l'employeur avec de nombreuses parties prenantes, tels les créanciers financiers, les clients et les fournisseurs, alors il n'y a pas de raison, a priori, qui justifie que ces entreprises gardent une marge de lissage inutilisée lorsqu'il n'y a pas de présence syndicale. A l'autre extrémité du spectre, dans les entreprises ayant des flux de trésorerie très stables, il semble que les entreprises répondent à la présence syndicale par une diminution (augmentation) du lissage (anti-lissage) afin de maintenir une légère volatilité de leurs résultats. Ce résultat suggère que les employeurs préfèrent maintenir un léger niveau de risque afin de limiter les revendications de la part des syndicats. Cependant, aucun lien entre lissage et prime salariale syndicale n'est identifié pour ces entreprises.

Ce chapitre montre également que l'intensité du lissage des résultats dépend fortement du niveau moyen des résultats de l'entreprise. Ainsi, si le lissage est très fort lorsque le résultat moyen est positif, il diminue progressivement lorsque le résultat moyen s'effondre dans

des valeurs négatives. Ce résultat permet, au sein des pratiques de gestion des résultats, de relier les pratiques de lissage des résultats et les pratiques de gestion des seuils de résultat. Le lissage des résultats semble largement utilisé par les entreprises à résultat moyen positif pour maintenir un résultat positif chaque année, tandis que les entreprises à résultat moyen négatif font en sorte de maintenir une volatilité plus importante de leurs résultats afin de pouvoir déclarer de temps en temps un résultat positif. Ce résultat suggère que le lissage est une conséquence directe des pratiques de gestion des seuils, en particulier de celui relatif au résultat positif. Si les syndicats sont associés à une rentabilité moyenne plus fréquemment négative (positive), alors une baisse (hausse) du lissage est la réponse naturelle de l'employeur qui cherche à déclarer des résultats positifs. Il faut distinguer cette réponse automatique de l'employeur d'une volonté de neutralisation des syndicats. Pour éviter ce biais, l'inclusion du résultat moyen dans les variables de contrôle doit permettre de capter la non-linéarité de l'association entre lissage et résultat moyen.

Ce chapitre propose également une revue des principales variables de lissage utilisées dans la littérature récente de finance et de comptabilité, ainsi qu'une proposition méthodologique pour la construction de variables de lissage lorsqu'elles sont destinées à être mises en interaction avec d'autres variables dans les régressions. Les deux familles identifiées sont les variables basées sur des ratios de volatilité, comme celle utilisée par [Leuz et al., 2003], et les variables basées sur des corrélations, comme celles utilisées par [Tucker and Zarowin, 2006]. Je propose une légère correction de la variable proposée par [Leuz et al., 2003] afin d'améliorer l'interprétation des résultats lorsque la variable de lissage est mise en interaction avec d'autres variables. En effet, la variable de lissage proposée par [Leuz et al., 2003] prend une valeur nulle, non pas lorsque le lissage est nul mais lorsqu'il est total, c'est-à-dire lorsque la volatilité des résultats est nulle. La modification proposée permet à la variable de lissage de prendre une valeur nulle lorsque le lissage est nul, ce qui est plus logique et améliore l'interprétation des résultats.

Les contributions de ce chapitre sont ainsi d'ordres méthodologiques et empiriques. En termes méthodologiques, il propose d'abord une présentation et une nomenclature des variables les plus utilisées dans la littérature récente, ensuite la modification d'une variable de lissage largement utilisée dans la littérature [Leuz et al., 2003] afin d'améliorer

l'interprétabilité des résultats lorsque cette variable est mise en interaction avec d'autres variables, et enfin l'inclusion d'un test de robustesse permettant d'évacuer la part de l'effet des syndicats sur le lissage qui correspond à la réponse automatique de l'employeur cherchant à déclarer des résultats positifs. Les résultats empiriques de ce chapitre peuvent être reliés à la littérature qui étudie l'effet du lissage de résultat sur le contenu informationnel de l'information financière [Chaney and Lewis, 1995, Subramanyam, 1996, Tucker and Zarowin, 2006], et à celle relative à la capacité d'influence des pratiques de gestion des résultats sur les parties prenantes [Roychowdhury, 2003, Jiang, 2008, Raman and Shahrur, 2008, Bova, 2013]. Enfin, plus spécifiquement, les résultats confirment et infirment certains résultats du seul article existant actuellement sur l'étude du lien entre lissage des résultats et présence syndicale [Hamm et al., 2017], suggérant d'approfondir ce champ de recherche.

## **Syndicats, écarts de rémunération entre hommes et femmes et rentabilité des entreprises**

Le troisième et dernier chapitre de cette thèse examine les interactions entre la présence syndicale et l'existence d'écarts de rémunération entre hommes et femmes dans les entreprises. Les différences de rémunération entre salariés ayant des caractéristiques observables similaires sont les conséquences d'une volonté de ne pas rémunérer identiquement chaque salarié. Les syndicats mettent en place des grilles de rémunérations car ils sont suspicieux face à l'individualisation des rémunérations dont ils craignent qu'elle ne soit fondée sur des critères opaques, subjectifs et inéquitables. Par ailleurs, une gestion individuelle des salariés, par le biais de primes individuelles ou de trajectoires professionnelles individualisées, peut permettre de fragiliser la cohésion du collectif des salariés sur laquelle repose la position de force des syndicats. Les écarts de rémunération entre hommes et femmes sont soit une volonté de discrimination des femmes par rapport aux hommes soit la conséquence d'une différence de productivité individuelle entre les femmes et les hommes. La discrimination des femmes semble peu rationnelle dans un contexte économique où les forces concurrentielles sont vives. Si le prix du travail d'une femme était inférieur à celui d'un homme, les entreprises chercheraient à embaucher des femmes prioritairement aux hommes et les prix de marché du travail de la femme et de l'homme retrouveraient le

même niveau après un processus de tâtonnement walrassien. La discrimination ne semble possible que si la quasi-totalité des employeurs sous-valorise systématiquement la valeur des femmes ou si des imperfections de marché importantes existent. La sous-estimation systématique de la valeur du travail des femmes par les employeurs est improbable à mesure que le nombre d'employeurs et de femmes actives croissent sur le marché, du fait de l'effet d'expérience. Par contre, le contexte culturel est une source potentielle de discrimination des femmes sur le marché du travail car il forme les femmes à adopter des caractéristiques comportementales moins favorables à la négociation salariale [Babcock and Laschever, 2003]. Les différences de productivité entre hommes et femmes peuvent provenir d'une implication plus importante des femmes dans les obligations familiales et d'une moindre appétence des femmes pour les environnements compétitifs ou risqués [Niederle and Vesterlund, 2007, Croson and Gneezy, 2009, Flory et al., 2015]. Une explication alternative pourrait être que les entreprises paient une prime afin de fidéliser leurs employés. Si les employeurs anticipent que les femmes doivent ou devront s'occuper davantage de leur foyer familial que les hommes, ils les perçoivent comme ayant moins d'ambition professionnelle et donc moins susceptibles de quitter leur entreprise pour progresser dans leur carrière. La réponse rationnelle des employeurs est donc de ne pas payer cette prime de fidélisation aux femmes qui seront donc moins payées que les hommes, à caractéristiques et à productivité égales. Il est important de noter qu'il n'y a, a priori, aucune raison qu'une femme soit intrinsèquement moins compétente qu'un homme : toute différence de rémunération est le résultat d'une discrimination culturelle et historique qui s'impose aux femmes. Cependant, d'un point de vue micro-économique, il est rationnel et non discriminatoire pour un employeur de rémunérer à la productivité. La mise en place de rémunérations différenciées est susceptible d'affaiblir les syndicats en fragilisant la cohésion du collectif des travailleurs. Cet affaiblissement des syndicats peut à son tour avoir des implications en termes de rentabilité des entreprises.

Ce dernier chapitre explore d'une part les origines de l'écart de rémunération entre les hommes et les femmes et d'autre part les effets sur la performance de cet écart et de son interaction avec la présence syndicale. Si l'écart de rémunération est une discrimination, il serait attendu que la représentation salariale combatte cette pratique illégale, soit en rétablissant une égalité de salaires, soit en permettant aux femmes de bénéficier

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d'avantages non financiers équivalents. Par contre, si l'écart de rémunération est la conséquence d'un différentiel de productivité, cela serait le signe que l'entreprise a mis en place une individualisation des rémunérations et les syndicats devraient avoir moins d'influence dans l'entreprise et donc un moindre effet sur sa rentabilité.

Les principaux apports de ce chapitre sont d'une part de fournir une méthodologie de mesure de l'écart de rémunération entre les hommes et les femmes au niveau de l'entreprise et d'en expliquer les déterminants, et d'autre part de montrer que si cet écart n'a pas, en moyenne, d'effet sur la rentabilité des entreprises, cela cache des associations aussi bien négatives que positives ou nulles en fonction des caractéristiques de l'entreprise. Toutes choses égales par ailleurs, les femmes dans les entreprises pratiquant un écart salarial important ne gagnent pas moins que les femmes dans les entreprises ne pratiquant pas d'écart salarial. Ainsi l'écart salarial se traduit par une augmentation du salaire des hommes mais pas par une baisse du salaire des femmes, ce qui implique une augmentation de la masse salariale de l'entreprise par rapport à ses concurrents. Parallèlement, l'écart salarial est associé à une augmentation de la valeur ajoutée produite par l'entreprise, laissant inchangée la rentabilité de cette dernière. Toutefois, la prise en compte de la présence ou de l'absence de syndicats change les conclusions. Dans les entreprises sans représentation syndicale, l'écart de rémunération entre les hommes et les femmes diminue la rentabilité des entreprises car l'augmentation de productivité est inférieure à l'augmentation des salaires. Dans les entreprises avec représentation syndicale, la rentabilité des entreprises peu féminisées est inchangée et celle des entreprises fortement féminisées est améliorée.

Ce chapitre expose également un comportement apparemment non documenté dans la littérature. Tandis que dans les entreprises peu féminisées les syndicats améliorent les salaires des hommes comme celui des femmes, dans les entreprises fortement féminisées les syndicats n'augmentent plus les salaires mais sont associés à une baisse significative de la création de valeur. Il semblerait que les syndicats adaptent leurs revendications aux groupes de salariés qu'ils représentent. Dans les entreprises peu féminisées les salariés sont principalement des hommes et réclament davantage de rémunération. Dans les entreprises fortement féminisées les salariés sont souvent des femmes<sup>5</sup> qui réclament davantage de

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<sup>5</sup>Les entreprises fortement féminisées sont les entreprises dont le taux de féminisation est supérieur à



flexibilité pour gérer leurs obligations familiales. Les syndicats procurent donc des avantages adaptés aux groupes en présence parmi les salariés représentés.

Les résultats indiquent que l'écart de rémunération entre les hommes et les femmes affaiblit la capacité des syndicats à procurer les avantages sus-cités. Dans les entreprises peu féminisées, la prime salariale syndicale décroît significativement, tandis que dans les entreprises fortement féminisées la baisse de création de valeur est significativement neutralisée. La pratique d'écarts de rémunération entre hommes et femmes augmente fortement la masse salariale mais semble être un outil efficace pour neutraliser l'effet des syndicats.

Enfin, il semblerait que les deux hypothèses théoriques de discrimination et de différentiel de productivité puissent expliquer l'écart de rémunération entre les hommes et les femmes. L'association positive entre l'écart de rémunération et la productivité suggère que l'écart de rémunération s'explique en partie par un différentiel de productivité. Cependant, la relation positive entre taux de féminisation et rentabilité, qui s'explique par une baisse des salaires supérieure à la baisse de productivité lorsque le taux de féminisation augmente, suggère que l'écart de rémunération est en partie lié à une discrimination envers les femmes. Cette discrimination salariale envers les femmes serait largement concentrée dans les entreprises dépourvues de représentation syndicale. En effet, l'effet positif de la féminisation des salariés sur la rentabilité est très fortement atténué dans les entreprises ayant des syndicats car la productivité chute significativement. Les femmes dans ces entreprises bénéficieraient de davantage de flexibilité, ce qui ajusterait leur niveau de productivité à leur salaire.

Les contributions de ce dernier chapitre sont de plusieurs ordres. Premièrement, il contribue à la littérature sur l'écart de rémunération entre les hommes et les femmes. Les résultats confirment les variables expliquant l'écart de rémunération [Blau and Kahn, 2017]. Deuxièmement, il contribue à la littérature sur l'effet de l'écart de rémunération entre hommes et femmes sur la rentabilité des entreprises. Une étude sur un changement législatif au Danemark a montré que la rentabilité n'était pas modifiée par une réduction de l'écart de rémunération, les salaires des hommes et la productivité baissant conjointement [Bennedsen et al., 2019]. Si l'effet moyen de l'écart de rémunération sur la rentabilité est la médiane de notre échantillon soit approximativement 40 % en équivalent temps plein.

non significativement différent de zéro, cet effet peut être négatif ou positif en fonction du taux de féminisation et de la présence de syndicats. Troisièmement, ce chapitre contribue à la littérature française sur l'effet des syndicats sur l'écart de rémunération entre les hommes et les femmes [Leclair and Petit, 2004, Duguet and Petit, 2006] en montrant que si les syndicats ne diminuent que peu l'écart de rémunération, ils offrent, dans les entreprises féminisées, des avantages non-financiers significatifs. Quatrièmement, ce papier contribue à la littérature sur l'effet de la satisfaction des employés [Edmans, 2011, Guiso et al., 2015, Huang et al., 2015] et des pratiques de responsabilité sociale [Ferrell et al., 2016, Deng et al., 2013] sur la valeur et la performance des entreprises. Le résultat indiquant que, dans les entreprises fortement féminisées ayant des syndicats, une augmentation de l'écart de rémunération entre les hommes et les femmes permet d'améliorer la rentabilité suggère que les femmes donnent peut être une plus grande importance à l'équilibre entre vie privée et vie professionnelle [Keloharju et al., 2019, Bertrand et al., 2010, Geiler and Renneboog, 2015, Angelov et al., 2016] qu'à des salaires plus élevés. Enfin, ce chapitre est aussi lié à la littérature sur l'effet des inégalités salariales sur la performance des entreprises [Heyman, 2005, Mueller et al., 2017, Rouen, 2019] car la compression des salaires et l'écart de rémunération entre hommes et femmes sont souvent liés [Blau and Kahn, 1992].



# Chapter 1

## Multi-unionism and the Performance of Firms

*Abstract :*

This paper examines the relationship between profitability, proxied by the return on assets, and the number of labor unions within firms. I show that the profitability of firms is lower in firms with multiple labor unions than in firms with a single labor union. The union wage premium increases as the number of labor unions rises while the labor productivity of the firms does not increase enough to compensate for this increasing wage premium, leading to lower profitability. More precisely, I find that this negative marginal effect of multi-unionism on profitability is circumscribed to situations where a strong labor union is competing with other labor unions, which hinders the labor productivity of the firms. The more labor unions there are in a firm, the more likely one of them will be a strong one. Finally, if multi-unionism benefits employees in the form of higher wages, it is, on average, at the expense of shareholders' wealth.

This paper empirically examines the relationships between the number of labor unions in a firm and various financial variables such as return on assets (profitability), labor productivity, strike occurrence and hourly wages. The traditional view postulates that there is a negative association between unions and profitability, arising from unions' ability to raise wages. Empirical evidence has shown early in the literature that unions can increase wages [Lewis, 1963]. Higher wages reduce profitability unless these higher labor costs can be offset by higher productivity. The empirical evidence on the association between the presence of labor unions and productivity seems to present mixed results [Pencavel, 1977, Brown and Medoff, 1978, Addison, 1982]. In an international meta-analysis [Doucouliagos and Laroche, 2003] show that there is, on average, no association between unions and productivity but that this pooled result is hiding country, time and industry specific associations between labor unions and productivity. Recent studies show that the impact of unionization on profitability, productivity and wages has been sharply reduced since the 1980s because labor unions have been constrained by the growing competitive pressures that their employer faces [Menezes-Filho, 1997, DiNardo and Lee, 2004]. Multi-unionism has raised concerns about its possible detrimental effect on efficiency because of the more complex collective bargaining process and because of the competition between labor unions. In the UK, multi-unionism has been associated with higher strike incidences [Ingram et al., 1993, Machin et al., 1993], lower productivity [Pencavel, 2004], higher wages and inferior financial performance [Machin et al., 1993], only when separate bargainings occur. Separate bargainings occur when the unions, representing different bargaining units, fail to bargain jointly with the management. Empirical evidence seems to indicate that the detrimental effect of multi-unionism is confined to firms where there are conflicting relationships between labor unions.

The impact of labor unions on the performance of firms is a major concern for all stakeholders because if shareholders seek a suitable return on their investments, other stakeholders, like lenders and employees, are also interested in the good run of the companies. Likewise, it is also a concern for policy makers because labor representation is regulated by law. US data do not allow to investigate the effect of multi-unionism because there is no data indicating which labor unions are in a particular firm at a specific time and UK data only rely on workplace-level surveys that can not be matched to firm-level

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databases. France has firm-level industrial relations data which can be merged with various financial databases.

The main contribution of this paper is to show that profitability, proxied by the return on assets, is lower in multi-union firms compared to single-union firms. The result is robust to firm matching and instrumental variable estimations. More precisely, I show evidence that the first labor union in a firm decreases profitability by reducing labor productivity whereas the subsequent labor unions further reduce profitability by increasing wages more than labor productivity.

First, I find that the return on assets decreases sharply with the first labor union, and again with the second labor union. The return on assets does not significantly decrease with the subsequent labor unions (third, fourth, fifth...). This finding indicates that if the presence of a labor union is detrimental to shareholders, the presence of multiple labor unions is even more detrimental and that the negative effect of multi-unionism happens as soon as the second labor union enters the firm.

Second, I check if the negative association between multi-unionism and the return on assets comes from a drop in the labor productivity of the firms. I show that firms with a single labor union are associated with lower labor productivity compared to non-union firms. However, firms with multiple labor unions have, on average, at least the same labor productivity as non-union firms, even if the results show that the probability of a strike in a given year increases with the number of labor unions in the firm. This finding suggests that strikes have, on average, either no significant effect on productivity because strikes are often very short and that workers are able to catch up with the work that has not been done, or that labor unions increase other productivity factors enough to compensate for the loss of production during strikes. Ultimately, the effect of labor unions on labor productivity explains the lower return on assets in single-union firms but not in multi-union firms.

Third, I investigate the effect of labor unions on wages. I find that the union wage premium is not significantly different from zero when there is only one labor union in the firm but that it increases significantly for each additional labor union in the firm. This finding

indicates that the negative association between multi-unionism and the return on assets is driven by a rising union wage premium.

Last, I was concerned about the possibility that these results were driven by the presence of specific labor unions such as strong labor unions, which advocate the class struggle and protest more, or managers labor unions, which focus on representing managers and deal with managerial issues. The presence of a strong labor union captures all the negative effect of multi-unionism on the return on assets, giving evidence that multi-unionism deters profitability because the more labor unions there are in a firm, the more likely one of them will be a strong one. Since strong labor unions, in single-union firms, do not decrease profitability more than other labor unions, it suggests that it is the competition between strong labor unions and other labor unions that is detrimental to the profitability of firms. This negative effect of strong labor unions on the return on assets in multi-union firms is entirely induced by a negative effect on labor productivity, the union wage premium remaining unchanged. On the other hand, managers labor unions increase wages more than other labor unions but also enhance labor productivity. As a result, managers labor unions do not deter profitability more than the other labor unions. This finding suggests that if strong labor unions are more detrimental to shareholders than other labor unions, managers labor unions are not.

To my knowledge, if union coverage has been widely investigated in the literature, the few empirical papers that tried to analyze the impact of multi-unionism focused on UK surveys data at the workplace-level. This paper tends to fill the gap using firm-level and employee-level data from various governmental databases on the French non-financial private sector. Full description of the institutional settings regarding the presence of labor unions within French firms can be found in [Appendice 2](#).

This study contributes to four main bodies of literature. First, I build on the large literature on union wage premium [[Duncan and Stafford, 1980](#), [Jarrell and Stanley, 1990](#), [Stewart, 1990](#), [Stewart, 1995](#), [Card, 1996](#), [Firpo et al., 2009](#)]. I provide evidence that, in France, the labor unions are still able to extract significant rents from shareholders. The union wage premium increases as the number of labor unions rises and varies across

the wage distribution. Second, I build on the literature on the impact of unionization on profitability [Voos and Mishel, 1986, Hirsch, 1991, Metcalf, 2003, Doucouliagos and Laroche, 2009]. Analyzing profitability, productivity and wages in a single paper, I show that labor unions can deter profitability through labor productivity, for single-union firms, or through the union wage premium, for multi-union firms. Third, by linking the negative association between multi-unionism and profitability with the presence of strong labor unions competing with other labor unions, this paper contributes to the literature on the detrimental effect of multi-unionism using a different focus. While previous studies focused on the occurrence of separate bargainings [Ingram et al., 1993, Machin et al., 1993, Pencavel, 2004], I focus on the competition between labor unions with diverging political ideologies. Last, by investigating the marginal effects of additional labor unions on various financial variables such as profitability, productivity, strikes and wages, this paper contributes to a newer strand of literature on the effects of unionization.

## 1.1 Hypothesis development

Profitability, which is shareholders' return, is driven by two channels : the productivity and the cost of the inputs other than shareholders' equity. In order to understand how the number of labor unions in a firm can affect its profitability, I propose to investigate the two following channels : wages and productivity.

My first hypothesis argues that unions improve wages, and therefore decrease profitability *ceteris paribus*, and that this wage premium increases with the number of unions in the firm. Light has already been shed on the union wage premium in the literature. One goal of the labor unions is to obtain wage concessions. Because employees at the individual level often do not have a high bargaining power, unions federate employees into a single voice to get concessions, by negotiation or threats of strikes. Wage concessions can be higher when the firm has a competitive advantage, because it is a source of quasi-rents which can be defined as economic abnormal profits that can therefore be subtracted from shareholders without preventing them from receiving their risk-adjusted expected return.



Wage concessions can also be higher when the firm has a lot of sunk costs like those of specific fixed assets such as research and development (R&D) because of the ex-post hold-up problem. The hold-up occurs when employees ask for wages concessions after the sunk costs are spent, which increases their bargaining power. Because the presence of multiple unions increases the competition among them, multi-unionism should lead to higher wage premia and the relation between wage premia and the number of unions should follow a monotonic increasing function.

My second hypothesis argues that unions may affect productivity, and therefore profitability *ceteris paribus*, and that the level of this effect on productivity should depend on the number of unions in the firm. Regarding the effect of unions on productivity, two opposite forces come into play.

First, unions can improve productivity. Their presence can enhance labor voice inside the workplace and the firm, fostering labor productivity by improving cooperation between workers and releasing the communication between workers and the top management. Moreover, even if French labor laws already give important protection to employees against dismissal, the presence of a union strengthens law enforcement by supplying law support to employees against arbitrary decisions from the management and offers an opposition against potential collective layoffs. This additional protection can increase employees' commitment and loyalty toward the firm and give them incentives to further invest in firm-specific human capital.

Second, unions can decrease productivity. Their presence, by giving a better protection against dismissal, can also encourage shirking because the negative consequences for supplying less effort are reduced. Moreover, if unions increase wages for low-wage workers at the expense of high-wage workers, this wage setting can discourage high value-added employees to stay in the firm, impeding the productivity of the firm. Furthermore, the hold-up problem mentioned earlier can lead to less investments in assets involving high sunk costs, leading to a lower long-term productivity. Finally, labor unions can impede organizational or strategic decisions, specially those related to restructuring.

Last, the number of unions in the firm could amplify or diminish each of these two forces

because of inter-unions cooperations or confrontations. The balance of these two opposite forces is an empirical question.

## 1.2 Data and descriptive statistics

### 1.2.1 Data

#### 1.2.1.1 Database construction

The sample of firm-year observations is drawn from the ACEMO-DSE<sup>1</sup> survey from 2009 to 2015. This survey is a labor relations survey produced every year by the DARES.<sup>2</sup> The ACEMO-DSE survey is constructed on a sample of French firms from private sector with ten or more employees. All French firms with more than 500 employees are covered each year, whereas a representative sample is drawn each year for smaller firms. Any lack of response or intentional error gives rise to an administrative fine in order to ensure the quality of the data. The survey contains various types of information at the firm-level, including the firm's SIREN (identification code used by the French administration), labor representation such as the presence of labor unions, occurrence of strikes and collective agreements. The survey indicates which labor unions have a section, certified or not, in the firm for a given year. I restrict the sample to firms with at least 20 full-time equivalent employees because smaller firms have a very small unionization rate (6%) and a multi-unionization rate close to zero (1%), which leaves no source of variations to investigate our research hypotheses on these particular firms. This absence of overlap between treated and untreated on those smaller firms may even raise concerns about extrapolation issues in the parametric estimations. This restriction will also ease comparison with previous studies constructed on the REPONSE<sup>3</sup> surveys which used to focus on workplaces with at least 20 employees.

To investigate profitability, productivity and wages, I create two different datasets, one for

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<sup>1</sup>Labor force activity and employment conditions : social dialogue in firms, DARES, Ministry of Labor.

<sup>2</sup>Direction de l'animation de la recherche, des études et des statistiques, French Ministry of Labor.

<sup>3</sup>Survey on professional relationships and business negotiations, DARES, Ministry of Labor.

the profitability, productivity and strikes models, which I will refer to as the *performance dataset*, and another one for the wage models, which I will refer to as the *wages dataset*.

**Performance dataset** First, I match the seven years of ACEMO-DSE data using the firms' SIREN to data from the French tax administration (DGFIP).<sup>4</sup> The annual declaration of financial statements to the tax administration gives precise and controlled accounting data such as balance sheet and income statement information. The tax administration data do not include banks, insurance companies, economic interest groups, associations and foundations, so the resulting merged dataset discards firms belonging to these entities. I then trim the data by removing firms that were said to be no longer active at the end of the fiscal year by the French tax administration, meaning that they had ceased or suspended their activity during the year. The accounting data from the tax administration allows to determine the earnings before interests and taxes (EBIT), the total assets and the value-added (VA), which is used to compute the dependent variables of the profitability and productivity models. Moreover, the data also give information on the NAF Rev.2 industry in which the firm operates and on the non-current tangible assets value which is used to compute a capital intensity variable. Second, the dataset is merged with the GECIR<sup>5</sup> also produced by the French tax administration (DGFIP) to identify firms engaged in R&D. Third, I match this merged dataset using the firms' SIREN to a manually aggregated dataset at the firm-level from the annual declaration of social data (DADS-Postes). The DADS is a social database produced by the INSEE.<sup>6</sup> The DADS is a declaratory formality that all companies with employees must carry out. In the DADS, employers supply various information about each employee: age, gender, job occupation, type of job contract, number of hours under job contract and amount of wages received. Thus, I am able to determine, for each firm, the number of full-time equivalent employees, the workforce mean age, the percentage of female and the socio-professional composition of the workforce.

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<sup>4</sup>Direction Générale des Finances Publiques, French Ministry of Budget, Public Accounts and Civil Administration.

<sup>5</sup>Database on the "Crédit Impôt Recherche", DGFIP.

<sup>6</sup>Institut national de la statistique et des études économiques, French Ministry for the Economy and Finance.

Last, the dataset is merged with the LIFI<sup>7</sup> database on business group affiliation, also produced by the INSEE, to identify firms belonging to a business group. The resulting sample contains 33,418 firm-year observations representative of the French non-financial private sector. The size and construction of this sample should alleviate any concern about selection bias. This sample will be used in the profitability, the productivity and the strikes models.

**Wages dataset** For the wage models, I merge employee-level data from the DADS-Postes to the performance dataset using the firms' SIREN. I obtain a database containing all the employment contracts in the 39,011 firm-year observations. However, running regressions using all employment contracts is computationally impossible and would bias the results because the largest firms would have too much weight. To avoid this large firm bias and to lighten the computations, I randomly pick 100 employments contracts coming from 100 different workers for each firm-year observation. The final sample for the wage model contains 2,742,333 employee-level observations. For each observation, in addition to the firm-level information coming from the performance dataset, the dataset indicates the following information at the employee-level : the wage, the number of hours under job contract, the age, the gender, the nationality (French, European or from outside the European Union), the location where the workplace operates (France is composed of 322 employment zones which are defined as geographical areas within which most of the workers reside and work, and in which firms' establishments can find the vast majority of their needed workforce), the job position (29 different socio-professional categories, using the 2 digits PCS-ESE job classification from the INSEE), the employment conditions (full-time, part-time, or mixed), the employment type (ordinary job, apprenticeship, traineeship, or assisted-job) and the type of job contract (unfixed-term, fixed-term, temporary contract, or seasonal employment). Furthermore, on the sub-sample of employees borned in October, an additional database on wages, the DADS-Panel, indicates when the employees first started to work in the firm. This database is used in order to compute a tenure variable on this sub-sample of employees.

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<sup>7</sup>Enquête sur les liaisons financières entre sociétés, INSEE.

## 1.2.2 Main variables

### 1.2.2.1 Dependent variables

To gauge the profitability at the firm-level I use the return on assets (ROA) defined as the earnings before interests and taxes (EBIT) over the total assets.

To explain the productivity at the firm-level I use the natural logarithm of the ratio of value-added over full-time equivalent employees. By construction, the regressions of this productivity variable will lead to the same coefficient estimates as would a Cobb-Douglas production function, which allows comparaisons in both finance and economic literature.

To determine the strikes occurrence at the firm-level I use a probit model. The dependent variable is the occurrence of at least one strike during a given year.

To explain the union wage premium using employee-level data, I use the natural logarithm of the hourly wage as dependent variable. This variable is widely used in Mincer-like wage models and allows to interpret the differences in wages induced by the variables of interest in percentage.

### 1.2.2.2 Variables of interest

**Variables related to the number of labor unions** "Union" indicates that there is at least one union in the firm. "Multiple unions" indicates that there are more than one union in the firm. "Number of unions" indicates the number of labor unions in the firm. "# union(s)" indicates that there is (are) "#" labor union(s) in the firm, "#" being an exact number, except for "five unions (or more)" which groups all firms with at least five labor unions. This agregation is justified by the few firms with more than five labor unions and the similarity of the results for these firms.

**Variables related to the type of labor unions** "Strong union" indicates that the Marxist labor union CGT, which advocates the class struggle, is in the firm. "Managers union" indicates the presence of the categorical labor union CFE-CGC that focuses on

representing managers and dealing with managerial issues.<sup>8</sup>

**Union coverage** In the US and UK literature, unionization rate is used as a proxy for union strength and added to the main model. Lack of control for union coverage, in the French context, is not an important issue, because French institutional settings make it easy for union coverage to be high as soon as a workplace is unionized. First, in France, workers benefit from unions' bargainings regardless of their union membership status. Union membership is disconnected from union coverage and is mainly a selfless financial support toward labor unions. Second, certification elections in France are run at the workplace-level and, even if there are different electoral colleges, the entire workforce is a single bargaining unit. To be certified at the workplace-level, a labor union only needs to gather 10% of the votes cast at the election. A workplace-level certified union will be representing all the employees of the workplace. For firm-level certification, the votes cast in all the firm's workplaces are added up. Labor unions gathering 10% of the added-up votes are certified at the firm-level. A firm-level certified union will be representing all the employees of the firm. The low percentage of votes needed and the firm-level agregation of the votes lead to high union coverage. These institutional settings should alleviate concerns about the lack of control for union coverage. Moreover, even if union membership may be a proxy for labor unions' support in the firm, in France, union membership status is not a public information, which means that only the unions know their members. The value of union membership in any French survey is only an estimation done by a respondent at a workplace-level, based on his beliefs. It decreases the precision of this variable in the French context compared to these of the US and the UK and limits the analysis to single-establishment firms, which may raise concerns about small sample bias. Moreover, endogeneity issues may arise because employees' affiliation to unions should be more visible to managers when firms are performing poorly.

[Appendice 2](#) gives definitions for all variables.

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<sup>8</sup>During the 2008-2012 electoral round, 26.77% of the votes were cast for the Marxist labor union CGT and 9.43% of the votes were cast for the managers labor union CFE-CGC.

### 1.2.3 Descriptive statistics

Table 1.1 shows the statistics of the main firm-level variables for both the performance dataset (firm-level data) and the wages dataset (employee-level data). The median size of the firms is below 200 full-time equivalent employees, meaning that the sample is mainly composed of small and medium-sized firms, because the survey design aims to construct a representative sample of the French firms. Most of the literature focus on public firms because of financial data availability. However, focusing only on public firms means focusing on larger firms, which leaves less variations for the variables we are interested in. 97% of the French firms with more than 500 employees are unionized, and most of them have many labor unions in place. Having a large part of the sample made of small and medium-sized firms allows for more information to be used and consistent estimates to be obtained. 60.62% of the firms are unionized and 45.25% experience multi-unionism, representing 74.65% of the unionized firms. The average number of labor unions is 1.79 with a standard deviation of 1.94 and a positive skewness of 0.85, confirming that a lot of firms are not unionized. On the sub-sample of unionized firms, the average number of labor unions is 2.95 with a standard deviation of 1.67. Strong labor unions are present in 42.36% of the firms and managers labor unions in 26.35% of the firms. In the sample, the average return on assets is 4.85%. Because the sample has many small firms which can have limited assets, the ROA is winsorized at 1%<sup>9</sup> to prevent outliers to parasitize the results with extreme high or low ROA. The distribution of the labor productivity measure is the consequence of the diverse characteristics of the firms in the sample. Capital intensity varies much because of the diversity of industries in which the firms of the sample operate. The mean age of the workforce is 40.19 years old, and its median is 40.66. The feminization rate of the workforce has a mean of 36.21 and a median of 30.18. The four variables related to the socio-professional composition of the workforce, the percentage of high-skilled white-collars, skilled white-collars, skilled blue-collars and unskilled blue-collars, have respectively a mean of 16.91%, 19.58%, 21.28% and 17.26%. The unreported workers, used as a base of comparison, are unskilled white-collars. The percentage of high-skilled white-collars and the percentage of unskilled blue-collars have a high positive skewness, respectively 2.01

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<sup>9</sup>Winsorizing at 2% or 5% leads to the same unreported results.

and 1.81, because a lot of firms have very low percentages of high-skilled white-collars or unskilled blue-collars.

Table 1.2 shows a frequency table for the presence of specific labor unions such as strong labor unions and managers labor unions. The more unions there are in a firm, the greater the likelihood that there will be one specific labor union in the firm. This correlation suggests that when investigating the effect of specific labor unions, the number of labor unions should be controlled for. The frequency table also gives information about the inclusion of observations in the various sub-samples used in robustness checks. The Match-F sub-sample only keeps matched firm-year observations based on a propensity-score matching without replacement within a 0.01 caliper, the SW sub-sample only keeps single-workplace firms and the large firms sub-sample only keeps observations related to firms that are not small and medium-sized firms.<sup>10</sup>

## 1.3 Empirical results

### 1.3.1 Does multi-unionism decrease the profitability of firms?

#### 1.3.1.1 The identification strategy

The main issue with labor relations surveys is that most firms are not part of the sample every year so the panel is highly unbalanced. On the sample at hand, only the firms with more than 500 full-time equivalent employees are in the sample every year. However, since nearly all these large firms have multiple labor unions in all years of the panel, firm fixed-effects can not be used to investigate the effect of multi-unionism on profitability because there are no intra-firm intertemporal variations on the "Multiple unions" variable. As a result, only pooled models can be used. To ensure a correct causal effect to be estimated, I reduce the omitted variables bias by controlling for variables which have a

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<sup>10</sup>Small and medium-sized firms are firms with less than 250 full-time equivalent employees and a turnover less than 50 millions euros or a total assets less than 43 millions euros, following the European Commission definition.



causal effect on the presence of labor unions and which also affect profitability. Since labor unions are set up by human beings, the pre-treatment variables that induce unionization must have a lot to do with the number of employees in the firm and with the composition of the workforce such as the age of the employees, their gender, their job positions and their professional culture.

**Control variables** First, to capture any size related effect, I use a continuous variable, the natural logarithm of the number of full-time equivalent (FTE) employees in the firm. The choice of FTE employees rather than the raw number of employees is driven by the lower incentives an employee has to set up a labor union if he is on a part-time job. The log-transformation is justified because the marginal effect of an additional FTE employee on both unionization and profitability should decrease as the number of FTE employees increases. Second, I include a variable for capital intensity constructed as the natural logarithm of the ratio of non-current tangible assets value over full-time equivalent employees, because the literature shows that labor unions are more likely to set in firms with high specific fixed assets in order to extract rents. Third, I add a R&D binary variable and a business group binary variable. Employees in R&D firms may unionize less because the professional culture surrounding innovation may keep employees away from unionization. Employees of firms affiliated with a business group may unionize more because these firms may have both more rent-seeking opportunities and a long-distance decision making process. Binary variables are used throughout the paper but similar unreported results are obtained using continuous variables such as total R&D expenditures over total sales and FTE employees of the group over FTE employees of the firm. Fourth, to capture the composition of the workforce, I add various variables. I add workforce mean age and workforce feminization rate because younger people and women may unionize less. I also add four variables to capture the socio-professional composition of the workforce. The first variable captures the percentage of high-skilled white-collars (managers and intellectual professions), the second one the percentage of skilled white-collars (intermediary professions), the third one the percentage of skilled blue-collars, and the fourth one the percentage of unskilled blue-collars. Finally, I add two fixed-effects. First, I added an industry fixed-effect at the NACE/NAF/CITI division-level

industry classification (88 industries) which captures the professional culture regarding unionization and the economic conditions the firm faces. Last, I added a year fixed-effect to capture any time trend. Unreported regression of "Number of unions" on the above covariates indicates an adjusted R-squared higher than 0.5, suggesting a high explanatory power of the covariates. First-stage regressions in the 2SLS tables report the same adjusted R-squared magnitude.

Some papers in the industrial relations literature add a lot of other control variables, such as human resource (HR) related variables. Most of those variables are not pre-treatment variables that induce unionization but they rather suffer from the bad controls issue [Angrist and Pischke, 2008] because they are largely determined by the presence of labor unions. Therefore, the lack of HR data availability on the sample at hand does not seem to be a big issue.

I address the concern of possible reverse causality issues (low or high performing firms may be more likely to incentivize workers to set up labor unions) in the section 1.3.5.2.

The profitability model is :

$$ROA_i = \alpha + \varphi.UN_i + \beta.X_i + \epsilon \quad (1.1)$$

In this model, ROA is earnings before interest and taxes (EBIT) scaled by total assets,  $i$  indexes the firms,  $UN$  represents various unionization situations and  $X$  is a vector of observable control variables.

### 1.3.1.2 Multi-unionism decreases the profitability of firms

Columns 1 to 3 of Table 1.3 shows that the profitability of firms, proxied by the return on assets, decreases when there are multiple labor unions.

In column 1, the coefficient estimate for the presence of labor unions is negative (-0.0191) and the coefficient estimate capturing the marginal effect of multi-unionism on the return on assets is also negative (-0.0083). Both estimates are significant at the 1% level. This finding suggests that multi-unionism is detrimental to shareholders' return. In column 2, the coefficient estimate for the number of unions in the firm is negative (-0.0046),

confirming that more labor unions in a firm is associated with lower profitability. Column 3 shows that, using multiple binary variables, the estimates for each number of labor unions are all negative. F-tests show that coefficient estimates for "One union" and "Two unions" are statistically different at the 1% level whereas the coefficient estimates for "Three unions", "Four unions" and "Five unions (or more)" are not statistically different from the estimate for "Two unions". This result indicates that the negative effect of multi-unionism on profitability is, on average, fully induced as soon as a second labor union is in the firm.

### **1.3.1.3 Multi-unionism negative effect on profitability is caused by strong labor unions**

Columns 4 to 6 of [Table 1.3](#) show that the negative effect of multi-unionism on profitability is driven by the competition between a strong labor union and other labor unions.

Column 4 shows that the presence of the managers labor unions does not mitigate nor aggravate the negative association between multi-unionism and profitability. Managers labor unions seem to have the same effect as any average labor union. Column 5 indicates that the presence of a strong labor union seems to worsen significantly the negative association between unionization and profitability (-0.0081). Last, column 6 indicates that the negative marginal effect of a strong labor union is actually circumscribed to situations where this labor union is in competition with other labor unions (-0.0146). More precisely, it appears that the coefficient estimates for each number of labor unions show no statistical difference between them anymore. This result indicates that the negative association between multi-unionism and profitability is linked to the fact that the more labor unions there are in a firm, the more likely one of them will be a strong labor union that will compete for the representation of workers, hampering the profitability of the firm.

## 1.3.2 Does multi-unionism decrease profitability through lower labor productivity?

### 1.3.2.1 The identification strategy

The productivity model is based on the same [control variables](#) as the profitability model. The model is derived from a Cobb-Douglas production function where the production factors are the labor, proxied by the number of full-time equivalent employees, and the capital, proxied by the non-current tangible assets value.

The model is :

$$\text{Log}(VA/L)_i = \alpha + \varphi.UN_i + \beta.X_i + \epsilon \quad (1.2)$$

In this model, the dependent variable is the natural logarithm of the ratio of value-added over full-time equivalent employees,  $i$  indexes the firms,  $UN$  represents various unionization situations and  $X$  is a vector of observable control variables.

**Choice of the functional form** I tested two types of production function. The first one was an augmented Cobb-Douglas production function and the second was an augmented translog production function. These production functions are augmented by including the four continuous covariates capturing the socio-professional composition of the workforce to control for human capital. The translog function better takes into account non-linearity between output and production factors as well as interactions between the production factors, allowing to get more information from the data. However, unlike the Cobb-Douglas production function, the estimation of a translog does not a priori respect the regularity conditions underlying the economic theory of production. The economic theory stresses that the production function needs to be monotonic in each production factor, so that each additional amount of a production factor can not decrease the output, and that the production function needs to be quasi-concave in order to have convex production isoquants. When testing the estimates of a translog on the data, it appears that monotonicity in capital is violated and quasi-concavity is not met because the eigenvalues of the Hessian matrix related to production factors are not all non-positive. Lots of paper have used

translog production functions without checking these regularity conditions, leading to questionable estimates. Recent literature using translog production functions tries to impose quasi-concavity and monotonicity. However, these restrictions must be set globally, for each observation, and not locally at the sample mean as it is done in most of the empirical works. Restricting the translog globally for both curvature and monotonicity needs tedious computation using Bayesian estimators. The use of these techniques is outside the scope of this paper, so I decided to use the augmented Cobb-Douglas production function. However, the unreported estimates using the translog specification are similar to the ones of the Cobb-Douglas specification. Finally, instead of directly estimating a Cobb-Douglas production function, I derive my model to fit the finance literature. The coefficient estimates of my model are strictly equivalent to those estimated when regressing a Cobb-Douglas production function (except for the firm size variable), which allows comparison both in the finance and economic literature.

**Measure of the production** The productivity model is based on a monetary measure of production and not a physical measure of the output. This choice is made because of the limitation of the available data. Monetary measure of production takes into account physical output and the price level. Since the presence of labor unions could improve wages, this wage premium could deter profitability. Firms could be willing to partially mitigate this negative impact on profitability by increasing their selling prices. If firms respond to the presence of labor unions by increasing prices, then the price effect would be mistaken as an enhancing productivity effect in the productivity model, because the value-added includes the price level. However, the growing competition on all goods and services markets should limit this price effect. Furthermore, if price effect exists, it should be concentrated on firms that have market power. Market power is often associated with firms in the most concentrated industries and large firms. Since I add both industry fixed-effects, which control for industry concentration, and firm size, I partial out a great part of the potential price effect attached to market power.

### 1.3.2.2 Multi-unionism does not decrease labor productivity

Columns 1 to 3 of [Table 1.4](#) show that if single-union firms are associated with lower labor productivity, multi-unionism mitigates this negative effect.

Column 1 shows that single-union firms are associated with lower labor productivity (-2.85%) but multi-unionism mitigates this effect (+2.17%). In column 2, the coefficient estimate for the number of unions in the firm is positive (+0.75%) but is hiding a non-linear relationship between the number of labor unions in the firm and labor productivity. Column 3 reveals this non-linear relationship, confirming the results from column 1. On average, multi-unionism is not associated with lower labor productivity compared to non-union firms.

### 1.3.2.3 Strong labor unions decrease labor productivity while managers labor unions increase it

Columns 4 to 6 of [Table 1.4](#) show that multi-union firms can be associated with lower or higher labor productivity than non-union firms, depending on which specific labor unions are representing workers.

Column 4 indicates that the managers labor union have a positive effect on labor productivity (+4.45%). This result indicates that the managers union may improve the organization and/or the information flows within the firms. Since the socio-professional composition of the workforce is finely controlled for, it alleviates the concern that this result could be biased by the type of firms in which this labor union aims for certification. Column 5 shows that the presence of a strong labor union has a negative effect on labor productivity (-2.51%). In column 6, when controlling for the interaction between the presence of a strong labor union and multi-unionism, there is evidence that the negative association between strong labor union and labor productivity is circumscribed to situations where the strong labor union is in competition with other labor unions (-4.38%). It may be that strong labor unions become radicalized when they have to compete for workers' representation within a firm.

### 1.3.3 Can strikes explain the association between multi-unionism and labor productivity?

#### 1.3.3.1 The identification strategy

The strikes model is a probit model based on the same **control variables** as the profitability model. Adding complementary control variables, such as the percentage of employees holding an ordinary contract (no apprenticeship, nor traineeship), an unfixed-term contract, and a full-time contract, did not change any result and was ignored in the final version of the paper for readability. The dependent variable is a binary variable which indicates whether at least one strike happens in a given year. The reported coefficient estimates are the marginal effects, for a better interpretability of the results. Poisson regressions on the number of employee-days of strikes gave a similar unreported trend.

The model is :

$$Prob(strike) = \alpha + \varphi.UN_i + \beta.X_i + \epsilon \quad (1.3)$$

In this model, the dependent variable is the occurrence of at least one strike,  $i$  indexes the firms,  $UN$  represents various unionization situations and  $X$  is a vector of observable control variables.

**Institutional settings** In France, the right to strike is a fundamental and constitutional right. The right to strike is defined as an individual right that can be exercised only collectively. It means that a single employee can not go on strike, but two employees can. Although the existence of intermediaries such as labor unions is not needed for employees to go on strike, the mandatory procedure to go on strike is often unknown by employees. If the mandatory procedure is not followed correctly, the employees that go on strike face the risk of dismissal for misconduct. As a result, labor unions ease the administrative burden and offer legal security, as well as solving the free-ride problem.

### 1.3.3.2 Multi-unionism increases the probability of a strike

Columns 1 to 3 of [Table 1.5](#) show that the probability of a strike increases as the number of labor unions rises.

Column 1 indicates that the probability of a strike is higher in multi-union firms than in single-union firms (+5.82%). Column 2 shows that the occurrence of strikes increases for each additional labor union in the firm (+3.09%). Column 3 further gives evidence that each additional labor union increases the probability of a strike (from +8.26% for a single-union firm to +21.07% for a firm with five or more labor unions). Even if employees do not need the call of a labor union to go on strike, this result indicates that, in practice, the call of a labor union inside the firm plays a decisive role in the occurrence of strikes. When there is a call of labor unions at the industrial or national-level because of unions' demands at these levels, the presence of a labor union inside the firm helps the mobilization of the workforce. If the reason of the strike is firm-specific, there is no outside call to go on strike, and the presence of a labor union inside the firm helps the mobilization of the workforce but also takes care of the administrative process and ensures the legal security of the employees during the strike. If when the number of labor unions rises, the probability of strike increases while the labor productivity does not decrease, it means that either strikes are not that detrimental to productivity, because they are often very short, or that the increasing number of labor unions compensates the cost induced by strikes, maybe by providing an improved labor voice. All in all, it seems that, on average, the hypothetical negative effect of labor unions through strikes should not be a major concern for shareholders because it is either insignificant or compensated.

### 1.3.3.3 Strong labor unions do not decrease labor productivity through strikes

Columns 4 to 6 of [Table 1.5](#) indicate that the probability of a strike is also higher when specific labor unions are in the firm, especially strong labor unions.

Column 4 shows that the managers labor unions are associated with a higher probability of strike but the magnitude of the estimate is low (+1.65%). Managers labor unions may occasionally incentivize managers to go on strike when particular issues regarding



managers are involved. In column 5, the coefficient estimate for the presence of strong labor unions is high (+8.54%). Column 6 shows that the effect of strong labor unions on strikes is the same in single-union firms and in multi-union firms. If strong labor unions do not increase the occurrence of strikes more in multi-union firms than in single-union firms while they decrease labor productivity only in multi-union firms, it gives evidence that they do not decrease labor productivity through strikes.

### 1.3.4 Does multi-unionism decrease profitability through higher wages?

#### 1.3.4.1 The identification strategy

The wage model is a Mincer-like model. Mincer models are run at the employee-level, controlling for employees and firms' characteristics. Models run at the employee-level better control for workforce composition, allow to control for the location of the workplace and account for multi-activity firms by allowing employees from the same firm to be splitted into different industries.

The model is :

$$HWAGE_i = \alpha + \varphi.UN_i + \beta.X_i + \epsilon \quad (1.4)$$

In this model, the dependent variable is the natural logarithm of the hourly wage,  $i$  indexes the employees,  $UN$  represents various unionization situations and  $X$  is a vector of observable control variables.

**Control variables** I keep all firm-level controls from the profitability model and add the dependent variable of the productivity model as a control to capture the productivity of firms, following the literature on wage model. To control for employees' characteristics, I choose any characteristic that could determine the hourly wage including age and its squared term, a binary variable for gender to capture the gender gap, and various categorical variables such as job positions (29 positions from the PCS-ESE job classification of the INSEE), nationality (French, foreigner from the European Union or from other parts

of the world), location where the workplace operates (322 employment zones), employment conditions (full-time, part-time, or mixed), employment type (ordinary job, apprenticeship, traineeship, or assisted-job) and type of job contract (unfixed-term, fixed-term, temporary contract, or seasonal employment). In the main model, experience is proxied by the age and the education level is proxied by the job position. Tenure can only be computed for employees born in October due to data limitation. I provide an additional specification including tenure, and its squared term, on this sub-sample of employees.

**Selection issue** Concerning unions wage premium, the recent literature has focused on the selection issue [Farber, 2001]. The selection issue occurs on the worker side and on the employer side. On the worker side, employees with high earning capacities will seek to join the non-union sector because they can aim for higher wages. On the employer side, among the workers who seek for union jobs, the queueing model [Abowd and Farber, 1982] shows that unionized employers will choose the most skilled job applicants because there are not enough unionized jobs for all the applicants. Since the selection issue is an omitted variable issue, I ensure selection on observables controlling for all covariates that have an effect on wages, using fine micro-data. Moreover, in France, the selection issue based on unobservable characteristics is less likely to be problematic for several reasons. First, the employees in a firm benefit from unions' negotiation regardless of their union membership so they can not choose to be represented or not. Second, the presence of unions in a firm is not a public information, so it is unlikely that job applicants will actually know that a firm is unionized and specifically aim to join it. Third, since setting up a union in a firm is easier than in most other countries, a lot of French firms are unionized so the queueing model may be less of a reality than in countries where less firms are unionized. Last, unemployment rate in France has been for decades twice higher than in the US and the UK so we can expect that job applicants are less likely to choose their employer.

#### 1.3.4.2 Multi-unionism increases wages

Column 1 to 4 of Table 1.6 show that multi-unionism increases wages. Each additional labor union increases the union wage premium.

Column 1 shows that single-union firms do not give higher wages than non-union firms. This finding suggests that the lower profitability in single-union firms is solely a consequence of lower labor productivity. Multi-union firms, on the other hand, are associated with higher wages (+2.24%). Since multi-union firms are not associated with lower labor productivity, this result indicates that the lower profitability in multi-union firms is caused by higher wages. In column 2, the coefficient estimates for the number of labor unions is positive (+0.92%) suggesting that wages increase with each additional labor union in the firm. To control for potential non linearity, column 3 shows the estimates for each number of labor unions. The union wage premium increases from zero for single-union firms to 4.73% in firms with five or more labor unions. Column 4 shows the estimates on the sub-sample of employees born in October for inclusion of a tenure variable as covariate. The coefficient estimates indicate the same exact pattern as in the full sample. The estimates for each number of labor unions are positive and statistically significant, except for single-union firms, rising from (+0.99%) for firms with two labor unions to (+4.61%) for firms with five or more labor unions. These results indicate that when there are more labor unions, the labor bargaining power in the wage negotiation process is stronger. This result is interesting because it runs counter the usual "divide and conquer" theory which advocates that fragmented labor representation decreases labor power. Possible explanations are that a multitude of labor unions can obtain higher overall support of the employees, because they embrace different ideologies, allows for a better monitoring of the capacities of firms to respond to the demands of labor unions, and promotes efficient labor unions by setting up an internal market for the representation of workers. Moreover, this finding extends the Traditional view, which states that unionization increases wages, in the case of multi-unionism. As the number of labor unions in a firm increases, the union wage premium increases, and the labor productivity does not increase sufficiently to offset the rise in payroll.

#### **1.3.4.3 Strong labor unions decrease profitability without increasing wages**

Column 5 to 7 of [Table 1.6](#) show that managers labor unions increase wages but strong labor unions do not.

Column 5 indicates that the managers labor unions increase the unions wage premium by 1.59% whereas columns 6 and 7 indicate that the presence of strong labor unions has no significant marginal effect on the union wage premium. A plausible explanation for this result is that since the managers labor unions increase labor productivity, they manage to make employees benefit from that productivity enhancement. Managers labor unions do not decrease nor increase profitability, which means that the value-added enhancement induced by the managers labor unions may be fully distributed to employees. By noting that managers labor unions increase wages whereas strong labor unions do not, it appears that the capacity of labor unions to increase wages may be constrained by their ability to increase labor productivity.

#### 1.3.4.4 Multi-unionism increases wages inequalities in the firm

[Figure 1](#) reports the effects of the presence of labor unions on the wage distribution. These estimates are obtained by running regressions of the recentered influence function of the unconditional quantiles on the explanatory variables [[Firpo et al., 2009](#)]. When studying wages, it is more interesting and informative to investigate how the presence of labor unions modifies the unconditional distribution of wages in the firms, rather than focusing on the conditional distribution of wages. Thereby, it is possible to determine whether unions favor lowest paid workers or not. All figures report estimates from the unconditional wage distribution, starting at 10%, ending at 90%, with 5% bins.

[Figure 1.a](#) shows that the presence of a single labor union increases wages, up to nearly 2% for the least paid workers, but the union wage premium decreases for higher quantiles and becomes negative for the workers in the last quartile. [Figure 1.b](#) indicates a positive marginal effect of multi-unionism compared to a situation with a single labor union. Multi-unionism seems to increase the wages of all workers, including the highest paid workers, following an inverted U-shaped function with an extremum at the median pay of nearly 3.5%. If the wage premium related to the presence of a single labor union is concentrated on the first tercile of the wage distribution, it is not the case for multi-unionism which favors higher paid employees. [Figure 1.c](#) indicates the marginal effect of an additional labor union in a firm. The effect is positive on all the unconditional distribution, up to

1.5% at the median pay. [Figure 1.d](#) shows that the union wage premium increases for each additional labor union in the firm. Regardless of a worker's position on the wage distribution, a worker will earn more in a similar unionized firm which has more labor unions. In any case, the worker will not earn less. A curve for a particular number of labor unions never goes above a curve representing a higher number of labor unions. The union wage premium can go up to 7.5% at the median pay when there are five or more labor unions in the firm. [Figure 1.e](#) shows that the managers labor unions lower the wages of the least paid workers and increases the wages of other workers, especially the highest paid, with a wage premium increase of 4% at the eighth decile. The 1.59% of increased wage premium, found in [Table 1.6](#), is largely directed to employees that this labor union aims to represent, namely the highest paid employees in the firm, even at the expense of other employees. The wage effect of this labor union increases wage inequalities within the firm. This result also explains why multi-unionism favors higher paid employees compared to the presence of a single labor union. The more labor unions there are in a firm, the more likely it is that managers labor unions will be present. As [Table 1.2](#) shows, the managers labor unions are almost never in a firm when the firm has a single labor union. [Figures 1.f](#) indicates that a strong labor union has no marginal effect on wages. This finding suggests that strong labor unions are not able to extract more financial compensation than other labor unions, even for the least paid workers.

### 1.3.5 Robustness checks

**Matching** The characteristics of firms, between non-union firms, single-union firms and multi-union firms, are not balanced. Unionized firms tend to be larger firms. The more employees there are, the more likely some of them will engage in unionizing. This covariates unbalance could rise concerns about potential endogeneity coming from regression extrapolation issues. In order to alleviate these concerns, I build a sub-sample of matched firms (Match-F) based on a propensity-score matching without replacement within a caliper of 0.01. Tests are run on the full and matched samples to evaluate covariates balance. The full (matched) sample has a *pseudo* -  $R^2$  of 0.535 (0.003), mean bias of 11.1

(1.1), median bias of 6.1 (0.8), max bias of 200.30 (3.32), Rubin's  $B^{11}$  of 218.2 (12.7) and Rubin's  $R^{12}$  of 1.18 (0.9). All these tests suggest that the matched sample has very good covariates balance.

**Union coverage and multi-activity** Even if I emphasize that the lack of control for union coverage, in the French context, is not an important issue (see [section 2.2.2](#)), I construct a sub-sample of single-workplace firms (SW) to alleviate concerns about union coverage driving the results. Since the certification of labor unions in France is done at the workplace-level and covers all the employees of the workplace, focusing on single-workplace firms automatically sets the union coverage to 0% for non-union firms or 100% for unionized firms. As a result, multi-union single-workplace firms have the same union coverage as single-union single-workplace firms. Moreover, focusing on single-workplace firms allows to alleviate any concern about multi-unionism being more frequent in multi-activity firms which bargain in various professional branches.

**Reverse causality** The study of the link between profitability and the presence of labor unions is also concerned by the possible reverse causality issue. If employees in lower (higher) performing firms are more willing to set up a labor union, to protect their jobs (increase their wages), then the estimates for the presence of labor unions may suffer from a negative (positive) bias. In France, setting a union in a firm is far less costly than in the UK and the US. The process is much lighter in France since it only requires two employees to set up a union section (uncertified union) in a firm. Then, this union section only needs to gather 10% of the votes cast at the next "élections professionnelles" to be certified. The organization of "élections professionnelles" takes place at least every four years in the firm. Absence of initiatives from the employer to organize them falls under criminal law. Moreover, uncertified labor unions can still organize and engage in strikes. If the costs of unionizing are lower in France, then, following a standard cost-benefit analysis, we should expect unionization not to take place only in places where the benefits are high. The

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<sup>11</sup>Rubin's B is the absolute standardized difference of the means of the propensity score index in the treated and non-treated group.

<sup>12</sup>Rubin's R is the ratio of treated to non-treated variances of the propensity score index.

reverse causality issue in the French context should be lower than in other countries such as the US and the UK. Although the reverse causality may be less of an issue in France, it remains questionable. When data limitation prohibits the use of firm fixed-effects, the best bets are to seek good instrumental variables to instrument the supposed endogenous variables and/or to find a sub-sample of firms for which the endogeneity issue should be negligible. In [section 3.5.2](#), I will propose two variables to instrument the number of labor unions in a firm. In [section 3.5.1](#), I will propose to run the estimation on a sub-sample of large unionized firms (LUF).<sup>13</sup> More than 90% of the large firms are unionized, so unionization in these firms should not be mainly driven by economic performance. I further discard non-union large firms from the sub-sample because they could have specific unobservables. The rationale underlying this sub-sample analysis is that there should be no reason to believe that poor (high) performing large unionized firms choose to have a specific number of labor unions.

#### 1.3.5.1 Robustness checks - Sub-samples analyses

[Table 1.7](#) shows the coefficient estimates of the relation between the presence of labor unions and the return on assets on the sub-samples of matched firms (columns 1 to 3), single-workplace firms (columns 4 to 6) and large unionized firms (columns 7 to 9). All the main results, on the association between profitability and the presence of labor unions, hold on this set of sub-samples.

In all sub-samples, both coefficient estimates for the "Union" and the "Multiple unions" variables (columns 1, 4 and 7) are negative and statistically significant. The coefficient estimates show the same pattern as with the full sample. Multi-union firms have a lower return on assets than similar single-union firms which themselves have a lower return on assets than non-union firms. The average coefficient estimate for multi-unionism is -0.0124, suggesting a drop in profitability when a firm gets multi-unionized. In all sub-samples, the coefficient estimates for the variable "Number of unions" (column 2, 5 and 8) is negative

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<sup>13</sup>Following the European Commission definition, small and medium-sized firms (SME) are firms with less than 250 full-time equivalent employees and total sales lower than 50 millions of euros or total assets lower than 43 millions of euros. Symmetrically, a large firm is a firm that is not a SME.

and statistically significant, suggesting the same pattern than the full sample. More labor unions lead to lower profitability. Last, the columns 3, 6 and 9 indicate a drop in profitability as soon as a second labor union is in the firm. All in all, the estimations run on the three sub-samples confirm the results obtained on the full sample.

### 1.3.5.2 Robustness checks - Instrumental variables

**Instrumental variables in the unionization literature** For an instrumental variable to be valid, it needs to be strongly correlated with the supposed endogenous regressor and uncorrelated with the error term of the structural model, so it can capture the part of the supposed endogenous regressor which is not correlated with the error term of the structural model. The most used instrumental variables in the literature regarding the link between unionization and profitability are the percentage of female, the percentage of blue-collar workers and the employees' mean age. On the data at hand, I find that both the percentage of female and the age of the workforce are strongly correlated to profitability, even after controlling for the presence of labor unions, which cast doubt on their supposed non-correlation with the error term of the structural model. Since job positions are a main characteristic of the employment structure, I stress that the percentage of blue-collar workers is a consequence of the type of industry the firm operates in. In developed countries, industries that employ a lot of blue-collar workers are on the decline because of the globalization process. Instrumenting the presence of labor unions with the percentage of blue-collar workers in the workforce will lead to a downward bias on the estimate for the presence of labor unions. The best option is still to add industry fixed-effect using the finest industry classification that can be used according to the data at hand. Variations in the presence of blue-collar workers within industries are most likely due to industries aggregation issues and need to be controlled for in the structural model. Age of the firms has also been used in some previous studies : I tested it on the data and it appears that it does not pass the first-stage. After controlling for the size of the firm, its age is not correlated anymore with the presence of labor unions. Young firms are just small firms, and the size of firms is correlated to both profitability and the presence of labor unions, so it must be controlled for.



**Instrumental variables proposal** In this paper, I propose one instrumental variable which happens to be strongly correlated with multi-unionism.

The instrumental variable is the support from employees for extremist political parties (far-left and far-right), which I proxy by using the local results of the first round of the major French political election, the Presidential election, which took place in 2012. It is supposed that if employees favor extremist political parties, they are more willing to complain and unionize to improve their conditions. The results of the election<sup>14</sup> are aggregated in order to compute the election results at the employment zone level which is the geographic area that characterizes the workforce. The instrumental variable is the average percentage of votes cast for extremist political parties (NPA, LO, FG, EELV, DLF and FN), in the employment zones where the firms' workplaces operate, weighted by the number of full-time equivalent employees in each employment zone.

**First-stage** Column 1 of [Table 1.8](#) shows the results of the first-stage regression. For this first-stage, multi-unionism is regressed using a probit model to alleviate any bias concern related to linear estimations. Coefficient estimate on the instrumental variable is positive, as expected, and significant at 1%. This result suggests that the instrumental variable passes the relevance restriction.

**Second-stage** Column 2 of [Table 1.8](#) shows that the coefficient estimate for multi-unionism is negative (-0.0144) and statistically significant, just as in [Table 1.3](#). The correlation between the error terms of the first-stage and second-stage equations is close to zero and is not statistically different from zero, suggesting that there is no unobservable that drives both multi-unionism and profitability. If the exclusion restriction holds for the instrumental variable, the result confirms that the profitability of a firm decreases with multi-unionism.

The exclusion restriction holds for the instrumental variable if the workers' support for extremist political parties is not correlated with the average profitability of firms in the

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<sup>14</sup>The results are available at <https://www.data.gouv.fr/fr/datasets/election-presidentielle-2012-resultats-572126/>

employment zone they work in (after controlling for the observables).

**Heteroskedasticity-based instruments** Column 3 of [Table 1.8](#) reports the results of the [[Lewbel, 2012](#), [Lewbel, 2018](#)] methodology using heteroskedasticity-based instruments. Stock-Yogo test suggests that the generated instruments are not weak and the Hansen-j test suggests that, based on the vector of coefficient estimates, the joint orthogonality of the instruments can not be rejected. The coefficient estimate for multi-unionism is negative (-0.0141), statistically significant, and comparable to both the estimate computed using the instrumental variable and the estimate of the standard OLS regression (-0.0133), further suggesting that multi-unionism decreases profitability.

## 1.4 Conclusion

Most of the finance literature on the link between labor unions and performance has focused either on industry-level union coverage of public US firms or on the presence of labor unions at the workplace-level on UK survey data. However, one single labor union in a firm might not have the same effect on performance than two, three, four or five different labor unions, for the same union coverage. Similarly, a strong labor union, such as a Marxist one, may not have the same effect on performance than other labor unions, for the same union coverage. Moreover, some labor unions might cohabit worse than others. In summary, the performance of a firm can be affected differently depending on the number and type of unions within it. The existing literature sweeps away the differences between these various unionization situations.

I show that the profitability of a firm drops when the first labor union is set and further drops with the second labor union. The profitability does not drop again when more labor unions are in the firm. This pattern is explained by a decrease in labor productivity when there is only one labor union and by a rising union wage premium when the firm has multiple labor unions. This higher union wage premium is not totally compensated by higher labor productivity, resulting in lower return on assets. This negative association between multi-unionism and profitability is driven by the situations where a strong labor

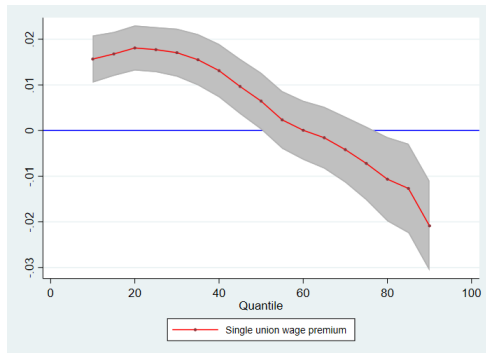
union is in competition with other labor unions because these situations are associated with lower labor productivity. The more labor unions there are in a firm, the more likely it is that a strong labor union will be present along with another labor union, this situation leading to higher wages without improving productivity to compensate for these higher wages. These findings suggest that the association between the number of labor unions and profitability might be time and country specific.

I also show that categorical labor unions that focus on managers improve labor productivity and wages. However, the wage premium is not increased for the lowest paid employees but, on the contrary, is increased for the highest paid employees. While this observation is not surprising because these labor unions seek wage concessions for the employees they represent, this wage effect implies more wage inequalities in the firms and ultimately in the society. Last, if managers labor unions improve labor productivity, there could be macro-economic gains in promoting such labor unions. In the US, managers can not unionize because they are not protected by the NLRA. Such institutional setting could actually inhibit economic growth.

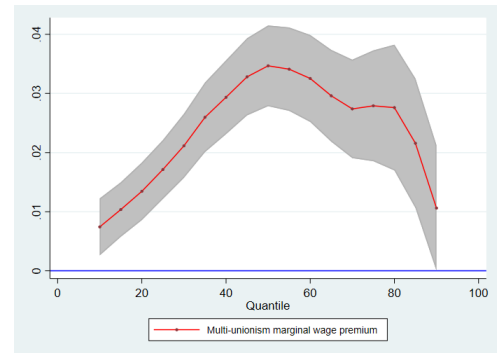
## 1.5 Figures

Figure 1.1: Wage model : Unconditional quantile regression results

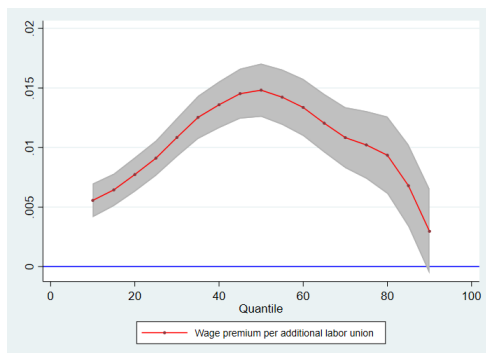
Dependent variable : HWAGE (natural logarithm of wage over the number of hours under job contract). This table reports the unconditional quantile regression results on the relation between the presence of labor unions and wage. All variables related to the presence of labor unions are binary variables, except the variable "Number of unions", used in graph (c), which is a categorical variable. [Appendice 2](#) gives definitions for all variables. The gray area around the curves are 95% confidence interval, adjusted for heteroscedasticity and clustered by firm. Control variables, industry and year fixed effects are included in all unconditional quantile regressions used to produce the graphs.



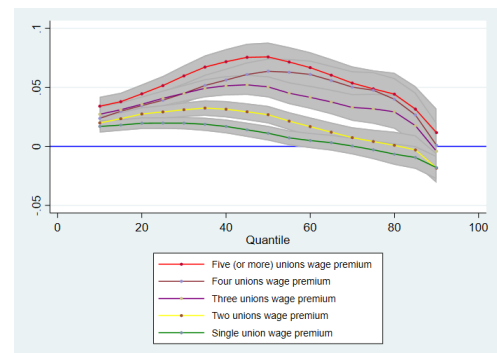
(a) First labor union



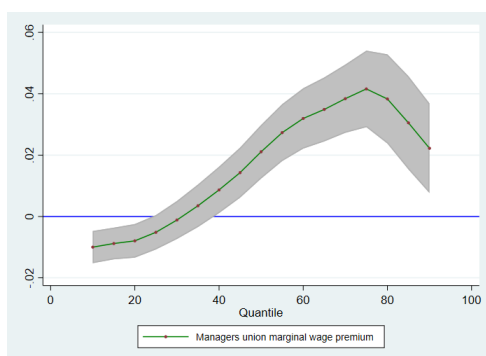
(b) Multi-unionism



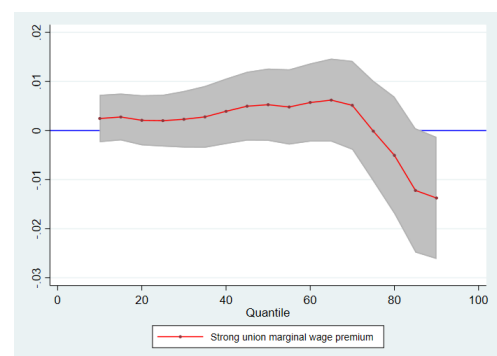
(c) Additional labor union



(d) Number of labor unions



(e) Managers labor union



(f) Strong labor union

## 1.6 Tables

Table 1.1: Summary statistics

This table reports the descriptive statistics of the main firm-level variables for both the performance dataset (firm-level data) and the wage dataset (employee-level data).

[Appendice 2](#) gives definitions for all variables.

	mean	sd	skewness	p50	min	max	count
Firm Size	5.2222	1.435	0.4537	5.146	2.9957	12.3627	33312
Union	0.6062	0.4886	-0.4346	1	0	1	33418
Multiple unions	0.4525	0.4977	0.1911	0	0	1	33418
Number of unions	1.7882	1.9386	0.8455	1	0	10	33418
Number of unions (if unionized)	2.95	1.6651	0.5732	3	1	10	20257
Strong union	0.4236	0.4941	0.3092	0	0	1	33418
Managers union	0.2635	0.4405	1.0736	0	0	1	33418
ROA	0.0485	0.1312	-1.1007	0.0495	-0.5712	0.4472	33370
Log(VA/L)	10.9788	0.5829	0.0918	10.9251	3.32	16.37	32987
Capital intensity	9.284	1.8054	-0.3524	9.4605	-1.5701	17.0892	32843
Workforce mean age	40.1872	4.3074	-0.5708	40.6619	18	59.4581	33076
Workforce feminization	0.3621	0.2502	0.5843	0.3018	0	1	33076
High-skilled white-collars	0.1691	0.2039	2.0115	0.0952	0	1	33076
Skilled white-collars	0.1958	0.1612	1.3572	0.1624	0	1	33076
Skilled blue-collars	0.2128	0.2286	0.942	0.1184	0	1	33076
Unskilled blue-collars	0.1726	0.2552	1.8072	0.0532	0	1	33076
Observations (firm-year)	33418						

Table 1.2: Frequency Table

This table reports the frequency of specific labor unions, depending on the number of labor unions in the firms. This table also reports the number of labor unions within firms for various sub-samples.

[Appendice 2](#) gives definitions for all variables.

Type of firms	No union	One union	Two unions	Three unions	Four unions	Five unions (or more)	Total
No strong union		67.65	38.66	18.57	8.88	1.18	30.12
Strong union		32.35	61.34	81.43	91.12	98.82	69.88
No managers union		94.92	78.21	54.64	32.78	6.59	56.53
Managers union		5.08	21.79	45.36	67.22	93.41	43.47
Not in matched sample	60.62	45.98	68.13	83.83	90.92	95.24	68.98
In matched sample (Match-F)	39.38	54.02	31.87	16.17	9.08	4.76	31.02
Multiple workplaces firms	39.74	53.10	60.77	70.75	78.73	84.89	57.07
Single workplace firms (SW)	60.26	46.90	39.23	29.25	21.27	15.11	42.93
Large firms	14.66	40.04	60.60	79.48	89.49	94.61	48.34
Small & Medium-sized firms	85.34	59.96	39.40	20.52	10.51	5.39	51.66
Number of observations	(13161)	(5137)	(4180)	(3699)	(3084)	(4157)	(33418)

Table 1.3: Profitability Model

This table reports the regression results on the relation between the presence of labor unions and the profitability of firms.

Dependent variable : ROA (EBIT over total assets). All variables related to the presence of labor unions are binary variables, except "Number of unions" which is a categorical variable. [Appendix 2](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. Industry and year fixed effects are included in all columns but the coefficient estimates are not reported. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Dependent variable	ROA	ROA	ROA	ROA	ROA	ROA
Column	(1)	(2)	(3)	(4)	(5)	(6)
Union	<b>-0.0191***</b> (-7.77)					
Multiple unions	<b>-0.0083***</b> (-3.16)					
Number of unions		<b>-0.0046***</b> (-5.65)				
One union			<b>-0.0191***</b> (-7.70)	-0.0192*** (-7.71)	-0.0165*** (-6.17)	-0.0196*** (-6.82)
Two unions			<b>-0.0271***</b> (-8.60)	-0.0273*** (-8.40)	-0.0222*** (-6.14)	-0.0189*** (-4.76)
Three unions			<b>-0.0274***</b> (-7.60)	-0.0279*** (-7.18)	-0.0209*** (-4.87)	-0.0165*** (-3.45)
Four unions			<b>-0.0285***</b> (-7.04)	-0.0292*** (-6.38)	-0.0212*** (-4.47)	-0.0163*** (-3.10)
Five unions (or more)			<b>-0.0271***</b> (-5.93)	-0.0281*** (-5.20)	-0.0192*** (-3.58)	-0.0138** (-2.34)
Managers union				<b>0.0011</b> (0.34)		
Strong union					<b>-0.0081***</b> (-2.77)	<b>0.0009</b> (0.23)
Strong union * Multiple unions						<b>-0.0146***</b> (-2.63)
Firm Size	-0.0006 (-0.60)	-0.0016 (-1.52)	-0.0006 (-0.52)	-0.0006 (-0.53)	-0.0005 (-0.50)	-0.0005 (-0.45)
Capital intensity	0.0047*** (6.65)	0.0048*** (6.64)	0.0047*** (6.65)	0.0047*** (6.63)	0.0047*** (6.69)	0.0047*** (6.69)
R&D	0.0029 (1.13)	0.0026 (1.02)	0.0029 (1.14)	0.0029 (1.13)	0.0029 (1.14)	0.0029 (1.16)
Business group	0.0018 (0.76)	-0.0010 (-0.43)	0.0018 (0.75)	0.0018 (0.76)	0.0019 (0.79)	0.0020 (0.81)
Workforce mean age	-0.0025*** (-8.47)	-0.0026*** (-8.95)	-0.0025*** (-8.49)	-0.0025*** (-8.54)	-0.0024*** (-8.45)	-0.0024*** (-8.48)
Workforce feminization	0.0199*** (2.85)	0.0183*** (2.61)	0.0198*** (2.84)	0.0199*** (2.85)	0.0196*** (2.81)	0.0196*** (2.82)
High-skilled white-collars	-0.0076 (-0.85)	-0.0088 (-0.99)	-0.0077 (-0.86)	-0.0080 (-0.88)	-0.0089 (-1.00)	-0.0092 (-1.03)
Skilled white-collars	-0.0014 (-0.15)	-0.0032 (-0.35)	-0.0014 (-0.15)	-0.0015 (-0.16)	-0.0017 (-0.19)	-0.0017 (-0.18)
Skilled blue-collars	-0.0291*** (-3.24)	-0.0314*** (-3.48)	-0.0291*** (-3.25)	-0.0291*** (-3.24)	-0.0288*** (-3.20)	-0.0287*** (-3.19)
Unskilled blue-collars	-0.0160* (-1.76)	-0.0163* (-1.78)	-0.0161* (-1.77)	-0.0160* (-1.76)	-0.0161* (-1.76)	-0.0161* (-1.76)
INDUSTRY FE	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES
Observations	32598	32598	32598	32598	32598	32598
Adjusted R-squared	0.050	0.048	0.050	0.050	0.051	0.051

Table 1.4: Productivity Model

This table reports the regression results on the relation between the presence of labor unions and the productivity of the firm. Dependent variable : Log(VA/L) (natural logarithm of value-added over full-time equivalent employees). All variables related to the presence of labor unions are binary variables, except "Number of unions" which is a categorical variable. [Appendix 2](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. Industry and year fixed effects are included in all columns but the coefficient estimates are not reported. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Dependent variable	Log(VA/L)	Log(VA/L)	Log(VA/L)	Log(VA/L)	Log(VA/L)	Log(VA/L)
Column	(1)	(2)	(3)	(4)	(5)	(6)
Union	<b>-0.0285***</b> (-3.07)					
Multiple unions	<b>0.0217**</b> (2.26)					
Number of unions		<b>0.0075**</b> (2.41)				
One union			<b>-0.0242***</b> (-2.60)	-0.0264*** (-2.84)	-0.0163 (-1.63)	-0.0254** (-2.40)
Two unions			<b>-0.0114</b> (-0.99)	-0.0205* (-1.76)	0.0036 (0.26)	0.0135 (0.89)
Three unions			<b>-0.0097</b> (-0.71)	-0.0286** (-1.96)	0.0103 (0.64)	0.0235 (1.34)
Four unions			<b>0.0047</b> (0.27)	-0.0236 (-1.25)	0.0270 (1.36)	0.0417* (1.94)
Five unions (or more)			<b>0.0316*</b> (1.78)	-0.0083 (-0.40)	0.0560*** (2.73)	0.0720*** (3.25)
Managers union				<b>0.0445***</b> (3.42)		
Strong union					<b>-0.0251**</b> (-2.33)	<b>0.0020</b> (0.13)
Strong union * Multiple unions						<b>-0.0438**</b> (-2.15)
Firm Size	-0.0090** (-2.13)	-0.0172*** (-3.95)	-0.0138*** (-3.10)	-0.0139*** (-3.13)	-0.0137*** (-3.08)	-0.0135*** (-3.03)
Capital intensity	0.1153*** (27.56)	0.1152*** (27.62)	0.1152*** (27.65)	0.1150*** (27.64)	0.1153*** (27.69)	0.1153*** (27.69)
R&D	0.0199** (1.96)	0.0202** (2.00)	0.0206** (2.03)	0.0200** (1.97)	0.0206** (2.04)	0.0208** (2.06)
Business group	0.0016 (0.20)	-0.0015 (-0.18)	0.0034 (0.42)	0.0047 (0.59)	0.0037 (0.46)	0.0039 (0.48)
Workforce mean age	0.0043*** (3.47)	0.0036*** (2.96)	0.0039*** (3.21)	0.0038*** (3.06)	0.0040*** (3.25)	0.0040*** (3.23)
Workforce feminization	-0.1180*** (-4.62)	-0.1182*** (-4.63)	-0.1158*** (-4.54)	-0.1149*** (-4.50)	-0.1165*** (-4.56)	-0.1165*** (-4.57)
High-skilled white-collars	1.1194*** (32.29)	1.1200*** (32.29)	1.1209*** (32.29)	1.1099*** (31.77)	1.1171*** (32.13)	1.1161*** (32.11)
Skilled white-collars	0.2895*** (8.87)	0.2871*** (8.81)	0.2900*** (8.89)	0.2863*** (8.78)	0.2890*** (8.87)	0.2891*** (8.87)
Skilled blue-collars	-0.1328*** (-3.95)	-0.1344*** (-4.00)	-0.1303*** (-3.87)	-0.1294*** (-3.84)	-0.1291*** (-3.84)	-0.1289*** (-3.83)
Unskilled blue-collars	-0.2688*** (-7.76)	-0.2673*** (-7.71)	-0.2669*** (-7.68)	-0.2639*** (-7.58)	-0.2669*** (-7.68)	-0.2668*** (-7.68)
INDUSTRY FE	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES
Observations	32348	32348	32348	32348	32348	32348
Adjusted R-squared	0.437	0.437	0.437	0.438	0.437	0.437

Table 1.5: Strike Model

This table reports the binomial regression results on the relation between the presence of labor unions and strikes. The reported coefficient estimates are the average marginal effects in order to ease interpretations.

Dependent variable : Strike (occurrence of at least one strike in a given year (binary variable)). All variables related to the presence of labor unions are binary variables, except "Number of unions" which is a categorical variable. [Appendice 2](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. Industry and year fixed effects are included in all columns but the coefficient estimates are not reported. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Model	Probit	Probit	Probit	Probit	Probit	Probit
Dependent variable	Strike	Strike	Strike	Strike	Strike	Strike
Column	(1)	(2)	(3)	(4)	(5)	(6)
Union	<b>0.1059***</b> (17.82)					
Multiple unions	<b>0.0582***</b> (10.49)					
Number of unions		<b>0.0309***</b> (20.87)				
One union			<b>0.0826***</b> (15.46)	0.0855*** (15.21)	0.0741*** (11.11)	0.0747*** (9.31)
Two unions			<b>0.1235***</b> (20.43)	0.1243*** (20.20)	0.0895*** (12.27)	0.0892*** (11.57)
Three unions			<b>0.1583***</b> (21.59)	0.1540*** (20.51)	0.1038*** (12.10)	0.1034*** (11.24)
Four unions			<b>0.1682***</b> (19.83)	0.1592*** (17.48)	0.1041*** (11.04)	0.1036*** (10.29)
Five unions or more			<b>0.2107***</b> (20.80)	0.1940*** (16.83)	0.1309*** (12.04)	0.1303*** (11.19)
Managers union				<b>0.0165***</b> (2.59)		
Strong union					<b>0.0854***</b> (15.06)	<b>0.0844***</b> (9.21)
Strong union * Multiple unions						<b>0.0016</b> (0.14)
Firm Size	0.0619*** (26.53)	0.0516*** (20.38)	0.0517*** (20.29)	0.0516*** (20.28)	0.0508*** (20.25)	0.0508*** (20.21)
Capital intensity	0.0053*** (3.01)	0.0050*** (2.98)	0.0051*** (3.00)	0.0051*** (2.96)	0.0047*** (2.74)	0.0047*** (2.74)
R&D	0.0098* (1.74)	0.0127** (2.28)	0.0113** (2.01)	0.0111** (1.98)	0.0116** (2.10)	0.0116** (2.10)
Business group	0.0167* (1.76)	0.0342*** (4.44)	0.0169* (1.84)	0.0174* (1.89)	0.0148 (1.59)	0.0147 (1.58)
Workforce average age	0.0090*** (11.74)	0.0081*** (11.08)	0.0081*** (10.77)	0.0080*** (10.57)	0.0079*** (10.69)	0.0079*** (10.69)
Workforce feminization	-0.0336* (-1.93)	-0.0238 (-1.42)	-0.0292* (-1.69)	-0.0280 (-1.62)	-0.0248 (-1.47)	-0.0248 (-1.47)
High-skilled white-collars	-0.0970*** (-3.89)	-0.0961*** (-3.94)	-0.0984*** (-3.97)	-0.1038*** (-4.17)	-0.0812*** (-3.33)	-0.0811*** (-3.33)
Skilled white-collars	0.0166 (0.67)	0.0214 (0.92)	0.0133 (0.55)	0.0105 (0.43)	0.0210 (0.88)	0.0210 (0.88)
Skilled blue-collars	0.0444* (1.84)	0.0497** (2.14)	0.0467** (1.96)	0.0471** (1.98)	0.0418* (1.81)	0.0418* (1.81)
Unskilled blue-collars	-0.0766*** (-3.29)	-0.0791*** (-3.49)	-0.0740*** (-3.22)	-0.0722*** (-3.14)	-0.0735*** (-3.26)	-0.0735*** (-3.26)
INDUSTRY FE	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES
Observations	32116	32116	32116	32116	32116	32116



Table 1.6: Wage model

This table reports the regression results on the relation between the presence of labor unions and wages, at the employee-level.

Dependent variable : HWAGE (natural logarithm of wage over the number of hours under job contract). Column 4 shows estimates obtained on a sub-sample (Tenure) of employees for which data allow to compute a tenure variable (all employees borned in October). All variables related to the presence of labor unions are binary variables, except "Number of unions" which is a categorical variable. [Appendice 2](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. Industry and year fixed effects are included in all columns but the coefficient estimates are not reported. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Sample	Full	Full	Full	Tenure	Full	Full	Full
Dependent variable	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Union	<b>-0.0020</b> <b>(-0.82)</b>						
Multiple unions	<b>0.0224***</b> <b>(8.26)</b>						
Number of unions		<b>0.0092***</b> <b>(10.58)</b>					
One union			<b>0.0015</b> <b>(0.59)</b>	<b>0.0021</b> <b>(0.60)</b>	0.0007 (0.29)	0.0015 (0.57)	0.0025 (0.90)
Two unions			<b>0.0103***</b> <b>(3.43)</b>	<b>0.0099***</b> <b>(2.59)</b>	0.0071** (2.32)	0.0104*** (2.89)	0.0094** (2.39)
Three unions			<b>0.0279***</b> <b>(7.61)</b>	<b>0.0255***</b> <b>(5.59)</b>	0.0212*** (5.45)	0.0281*** (6.31)	0.0268*** (5.51)
Four unions			<b>0.0344***</b> <b>(7.75)</b>	<b>0.0338***</b> <b>(6.10)</b>	0.0244*** (5.07)	0.0347*** (6.64)	0.0332*** (5.89)
Five unions (or more)			<b>0.0473***</b> <b>(9.93)</b>	<b>0.0461***</b> <b>(7.89)</b>	0.0331*** (6.03)	0.0476*** (8.42)	0.0459*** (7.54)
Managers union					<b>0.0159***</b> <b>(4.63)</b>		
Strong union						<b>-0.0002</b> <b>(-0.08)</b>	<b>-0.0032</b> <b>(-0.76)</b>
Strong union * Multiple unions							<b>0.0047</b> <b>(0.84)</b>
Tenure				0.0138*** (34.43)			
Tenure (squared)				-0.0003*** (-21.69)			
Employee age	0.0175*** (59.13)	0.0175*** (59.33)	0.0175*** (59.33)	0.0155*** (27.29)	0.0175*** (59.35)	0.0175*** (59.33)	0.0175*** (59.33)
Employee age (squared)	-0.0001*** (-37.03)	-0.0001*** (-37.17)	-0.0001*** (-37.18)	-0.0001*** (-17.26)	-0.0001*** (-37.22)	-0.0001*** (-37.18)	-0.0001*** (-37.18)
Employee gender : female	-0.0974*** (-101.29)	-0.0974*** (-101.39)	-0.0974*** (-101.37)	-0.0927*** (-42.91)	-0.0974*** (-101.45)	-0.0974*** (-101.38)	-0.0974*** (-101.39)
Firm Size	0.0097*** (8.76)	0.0050*** (4.30)	0.0055*** (4.66)	0.0055*** (3.84)	0.0055*** (4.65)	0.0055*** (4.67)	0.0055*** (4.64)
Log(VA/L)	0.0923*** (23.60)	0.0919*** (23.50)	0.0919*** (23.53)	0.0880*** (20.29)	0.0917*** (23.47)	0.0919*** (23.51)	0.0920*** (23.52)
Firm leverage	-0.0239*** (-3.97)	-0.0239*** (-3.97)	-0.0234*** (-3.90)	-0.0192*** (-2.58)	-0.0231*** (-3.84)	-0.0234*** (-3.91)	-0.0234*** (-3.91)
Capital intensity	0.0071*** (7.07)	0.0072*** (7.16)	0.0071*** (7.11)	0.0054*** (4.87)	0.0070*** (7.06)	0.0071*** (7.10)	0.0071*** (7.10)
Workforce mean age	0.0032*** (9.58)	0.0028*** (8.52)	0.0029*** (8.70)	0.0027*** (6.55)	0.0028*** (8.45)	0.0029*** (8.70)	0.0029*** (8.70)
Workforce feminization	-0.0422*** (-5.54)	-0.0410*** (-5.44)	-0.0398*** (-5.27)	-0.0356*** (-3.81)	-0.0393*** (-5.21)	-0.0398*** (-5.27)	-0.0398*** (-5.27)
High-skilled white-collars	0.1543*** (12.93)	0.1578*** (13.23)	0.1580*** (13.24)	0.1249*** (8.80)	0.1538*** (12.84)	0.1579*** (13.24)	0.1580*** (13.24)
Skilled white-collars	0.0447*** (4.55)	0.0453*** (4.65)	0.0456*** (4.68)	0.0324*** (2.72)	0.0442*** (4.54)	0.0456*** (4.68)	0.0455*** (4.67)
Skilled blue-collars	0.0468*** (4.43)	0.0480*** (4.56)	0.0495*** (4.70)	0.0361*** (2.88)	0.0499*** (4.75)	0.0495*** (4.71)	0.0495*** (4.70)
Unskilled blue-collars	-0.0260*** (-2.80)	-0.0243*** (-2.64)	-0.0230** (-2.50)	-0.0375*** (-3.31)	-0.0217** (-2.37)	-0.0230** (-2.50)	-0.0231** (-2.50)
Other firm-level controls	YES	YES	YES	YES	YES	YES	YES
Other employee-level controls	YES	YES	YES	YES	YES	YES	YES
INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES	YES
Observations	2742333	2742333	2742333	203276	2742333	2742333	2742333
Adjusted R-squared	0.622	0.622	0.622	0.662	0.622	0.622	0.622

Table 1.7: Sub-samples analyses

This table reports the regression results on the relation between the presence of labor unions and profitability on various sub-samples. Dependent variable : ROA (EBIT over total assets) Sub-samples : Match-F (Matched firms using propensity-score matching) ; SW (Single-workplace firms) ; LUF (Large unionized firms). All variables related to the presence of labor unions are binary variables, except "Number of unions" which is a categorical variable. Appendix 2 gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. Industry and year fixed effects are included in all columns but the coefficient estimates are not reported. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Sub-sample	Match-F	Match-F	Match-F	SW	SW	LUF	LUF	LUF
Dependent variable	ROA	ROA	ROA	ROA	ROA	ROA	ROA	ROA
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Union	<b>-0.0147***</b> (-4.72)			<b>-0.0226***</b> (-6.39)				
Multiple unions	<b>-0.0165***</b> (-4.06)			<b>-0.0086**</b> (-2.07)			<b>-0.0122***</b> (-3.26)	
Number of unions		<b>-0.0095***</b> (-7.79)			<b>-0.0078***</b> (-5.78)			<b>-0.0031**</b> (-2.54)
One union			<b>-0.0148***</b> (-4.73)			<b>-0.0231***</b> (-6.50)		
Two unions			<b>-0.0328***</b> (-7.48)			<b>-0.0275***</b> (-5.65)		<b>-0.0094***</b> (-2.02)
Three unions			<b>-0.0309***</b> (-4.73)			<b>-0.0343***</b> (-5.43)		<b>-0.0110***</b> (-2.48)
Four unions			<b>-0.0273***</b> (-3.13)			<b>-0.0377***</b> (-4.93)		<b>-0.0150***</b> (-3.18)
Five unions or more			<b>-0.0272**</b> (-2.43)			<b>-0.0376***</b> (-4.13)		<b>-0.0167***</b> (-3.19)
Firm Size	-0.0002 (-0.11)	0.0006 (0.29)	-0.0004 (-0.19)	0.0011 (0.55)	0.0006 (0.32)	0.0019 (0.97)	0.0017 (0.96)	0.0030 (1.63)
Capital intensity	0.0049*** (4.90)	0.0049*** (4.88)	0.0049*** (4.90)	0.0025*** (2.77)	0.0024*** (2.68)	0.0025*** (2.75)	0.0051*** (3.48)	0.0052*** (3.50)
R&D	-0.0040 (-0.92)	-0.0040 (-0.92)	-0.0040 (-0.91)	-0.0054 (-1.31)	-0.0056 (-1.37)	-0.0056 (-1.37)	0.0055 (1.54)	0.0052 (1.46)
Business group	0.0073* (1.82)	0.0074* (1.84)	0.0073* (1.81)	0.0084*** (2.87)	0.0068** (2.34)	0.0082*** (2.81)	-0.0115 (-0.93)	-0.0109 (-0.89)
Workforce average age	-0.0017*** (-3.69)	-0.0016*** (-3.61)	-0.0017*** (-3.71)	-0.0030*** (-7.95)	-0.0031*** (-8.33)	-0.0030*** (-7.90)	-0.0030*** (-4.93)	-0.0029*** (-4.82)
Workforce feminization	0.0182* (1.88)	0.0178* (1.83)	0.0183* (1.89)	0.0318*** (3.54)	0.0291*** (3.25)	0.0308*** (3.44)	0.0379** (2.56)	0.0376** (2.54)
High-skilled white-collars	-0.0159 (-1.18)	-0.0166 (-1.22)	-0.0158 (-1.16)	-0.0251* (-1.92)	-0.0274** (-2.10)	-0.0261** (-2.00)	0.0311* (1.79)	0.0313* (1.81)
Skilled white-collars	-0.0076 (-0.59)	-0.0079 (-0.58)	-0.0075 (-0.58)	0.0027 (0.22)	0.0016 (0.13)	0.0023 (0.19)	0.0299 (1.40)	0.0306 (1.43)
Skilled blue-collars	-0.0188 (-1.43)	-0.0196 (-1.49)	-0.0186 (-1.42)	-0.0218* (-1.76)	-0.0243* (-1.95)	-0.0227* (-1.83)	-0.0151 (-0.78)	-0.0152 (-0.78)
Unskilled blue-collars	0.0066 (0.53)	0.0060 (0.48)	0.0068 (0.54)	-0.0096 (-0.82)	-0.0108 (-0.92)	-0.0106 (-0.90)	-0.0148 (-0.74)	-0.0150 (-0.75)
INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES	YES	YES
Observations	10366	10366	10366	13859	13859	13859	13287	13287
Adjusted R-squared	0.035	0.033	0.034	0.078	0.076	0.078	0.065	0.065

Table 1.8: Instrumental variables analyses

This table reports regression results on the relation between multi-unionism and profitability on the sub-sample of unionized firms. Column 1 is the first-stage where multi-unionism is determined through a probit link and column 2 is the second-stage where ROA is estimated by maximum-likelihood. The instrumental variable is the firm's workforce's support for extremist political parties. Column 3 reports the results of the Lewbel's methodology using heteroskedasticity-based instruments. Column 4 reports the OLS results for comparison concerns. [Appendice 2](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. Industry and year fixed effects are included in all columns but the coefficient estimates are not reported. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Sample	UNION	UNION	UNION	UNION
Estimation	Probit	ML	Lewbel	OLS
Stage	First-stage	Second-stage	Second-stage	N/A
Dependent variable	Multiple unions	ROA	ROA	ROA
Column	(1)	(2)	(3)	(4)
Support for extremist political parties	<b>1.3008***</b> <b>(3.62)</b>			
Multiple unions		<b>-0.0144*</b> <b>(-1.83)</b>	<b>-0.0141***</b> <b>(-2.75)</b>	<b>-0.0133***</b> <b>(-4.90)</b>
Firm Size	0.6863*** (37.87)	0.0030* (1.87)	0.0030** (2.08)	0.0029** (2.42)
Capital intensity	-0.0073 (-0.70)	0.0049*** (4.77)	0.0049*** (4.77)	0.0049*** (4.76)
R\&D	-0.0097 (-0.24)	0.0049 (1.61)	0.0049 (1.61)	0.0049 (1.61)
Business group	0.2216*** (4.16)	-0.0027 (-0.51)	-0.0027 (-0.52)	-0.0028 (-0.54)
Workforce average age	0.0577*** (11.67)	-0.0026*** (-5.69)	-0.0026*** (-5.74)	-0.0026*** (-5.80)
Workforce feminization	-0.1485 (-1.35)	0.0295*** (2.84)	0.0295*** (2.84)	0.0295*** (2.83)
High-skilled white-collars	0.3244** (2.00)	0.0205 (1.53)	0.0205 (1.53)	0.0205 (1.52)
Skilled white-collars	0.3375** (2.17)	0.0241 (1.56)	0.0241 (1.55)	0.0240 (1.55)
Skilled blue-collars	-0.1481 (-0.95)	-0.0149 (-1.06)	-0.0149 (-1.06)	-0.0149 (-1.06)
Unskilled blue-collars	-0.4086*** (-2.90)	-0.0083 (-0.58)	-0.0083 (-0.58)	-0.0082 (-0.57)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	19406	19406	19406	19406
corr(e.multisynd , e.rentab)		0.0051 (0.15)		
Cragg-Donald Wald F statistic			97.684	
Stock-Yogo 5% IV relative bias			21.13	
Hansen-j p-value			0.451	
Adjusted R-squared			0.047	0.047

## 1.7 Appendice

### Appendice 1 : French Institutions

Institutions shaping labor relations differ in the US, or the UK, and in France. In the US and in the UK, one union, and only one, negotiates for a bargaining unit which is a group of employees with a community of interest (similar occupations, geographic location, duties, payment structure, review/rating system, etc.). The union coverage depends on the size of the bargaining units compared to the size of the firm. US multi-unionism leads to a competition between unions to conquer and keep bargaining units and to get more concessions for their bargaining unit, eventually at the expense of other bargaining units. However, unions can also join forces to negotiate an agreement with the employer. Joint-bargaining allows several unions to agree on common goals and act in unison during a round of collective bargaining.

**Certification process** In France, since 2008, every two to four years, elections, called "élections professionnelles", take place in each establishment (i.e. workplace) of a firm to determine which labor unions will be certified for the next two to four years. For these elections, employees are splitted into two to three electoral colleges depending on their occupational position. There are at least one college for low-skilled workers and one college for high-skilled workers (technicians, foremen, engineers and managers), the latter college being splitted for large firms into one college for technicians and foremen and one college for engineers and managers. Each labor union has statutes which define the electoral colleges in which the union will seek certification. During the period of time covered by this study, all the French labor unions seek certification in all the electoral colleges, except one, the CFE-CGC, which seeks certification only in the college(s) for high-skilled workers because this labor union focuses on representing only the managers. When a union seeks certification in multiple colleges of an establishment, the certification is obtained for all colleges or for none. To be certified, a union needs to gather 10% of the votes cast by the employees of the colleges in which the union seeks certification. As a result, the presence of one single labor union is enough for all an establishment's workforce to be

covered by collective agreements. Since the certification occurs at the establishment-level, it only allows the union to negotiate for the employees of that particular establishment. However, a union can be certified at the firm-level without being certified in all the firm's establishments if it gathers 10% of the whole votes cast at the elections which took place in the firm's establishments. The CFE-CGC, which represents only the managers, only needs to gather 10% of the votes cast in the colleges representing supervisors. The 10% threshold is low compared to the majority vote needed in the US. This difference can be explained by the fact that, in France, multiple unions can be certified for the same electoral college. When multiple labor unions are certified for the same electoral college, these labor unions negotiate for the same employees, leading to inter-unions cooperation or confrontation during the bargaining process with the firm management. In French multi-unionism, the unions' weight in collective bargaining depends on the results of the "élections professionnelles". A union (or a coalition of unions) needs to have received 30% of the votes cast at the elections in order to be able to sign a collective agreement. However, if a union (or a coalition of unions) received a majority of the votes cast at the elections, it owns an opposition right that allows it to cancel any collective agreement signed by other unions, within eight days after its signature.

**Description of the French labor unions** Seven union confederations regroup the French labor unions. All of them, with the exception of one, regroup unions that seek certification in all the electoral colleges, meaning they aim to represent all the workforce. These unions are called non-categorical unions because they do not negotiate for specific categories of employees. These non-categorical unions are the CGT, FO, Solidaires, the CFDT, the CFTC and the Unsa. The three largest confederations, the CGT, FO, and the CFDT, have received at the national-level more than 68% of the total votes cast at the "élections professionnelles" in French firms for the 2008-2012 electoral round, leaving few space for the other non-categorical unions. The interesting part of the French context is that from these six confederations, the CFDT, the CFTC and the Unsa have self-proclaimed themselves "reformist" because they promote less adversarial relations with the firm's management and weaker opposition toward liberal labor law reforms, leading to a real ideological opposition with the other confederations, especially with the CGT which

is an ex-communist labor union that still advocates the class struggle. The last union confederation, the CFE-CGC, regroups categorical unions that aim to specifically negotiate for managers and so it only seeks certification in the colleges representing supervisors. The existence of these unions for managers is explained by the fact that even if non-categorical unions can and do negotiate for all type of employees, managers have specific interests that do not fully overlap these of the other employees. However, this confederation has widen its scope since its creation and now negotiates not only for employees who hold a management position but also for employees who may hold one in their career. As a result, these unions seek certification in the electoral colleges regrouping the technicians, foremen, engineers and managers. The last decades have led to large changes in the employment structure in France, with a decline in unskilled employment, leading to a large coverage of the labor force by the CFE-CGC.<sup>15</sup> However, this confederation still focuses on managerial issues which differentiates it from the other unions. Furthermore, the CFE-CGC has publicly stated that its position toward the ideological dichotomy between the Reformist unions and the ex-communist CGT was to pursue a third way in-between these two extremes.

**Uncertified labor unions** Labor unions that fail to be certified are not to be ignored. In France, a labor union only needs to have two members in a firm in order to have the right to set a union section. These sections have the same rights as the certified labor unions, except that they can not participate in the collective bargaining process nor sign collective agreements. They can have a physical place inside the firm to manage their activities, seek support from the workforce, and engage this workforce into strikes.

**Union membership** In France, the benefits of unions' representation is totally disconnected from union membership. All the employees who are part of an electoral college in which a union has been certified will benefit from the bargaining of this union, whether they are members of this union or not. This setting gives few economic incentives to be member of a union in France. At best, it gives access to some scarce benefits often limited to some social information. At the same time, unions are funded by public subsidies and

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<sup>15</sup>In the 2008-2012 electoral round, the colleges in which the CFE-CGC was seeking certification represented 51.98% of the French labor force.

employer's obligations such as work discharges, allowing them to survive without a huge membership base. These institutional settings can explain the contrast between the low rate of union membership in France (11% in 2013) and the large rate of unionization of the French firms (59% in 2013).<sup>16</sup> However, if union membership does not offer much benefit to an employee, it means that employees who choose to be member of a labor union have a high level of support toward unions' activities.

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<sup>16</sup>DARES Analyses 015, March 2017.

## Appendice 2 : Variables definitions

Variable name	Source
Unionization variables	
Union	ACEMO-DSE
Multiple unions	ACEMO-DSE
Number of unions	ACEMO-DSE
# unions	ACEMO-DSE
Strong union	ACEMO-DSE
Managers union	ACEMO-DSE
Dependent variables	
ROA	FARE
Log(VA/L)	FARE
Strike	ACEMO-DSE
HWAGE	DADS
Instrumental variables	
Support for extremist political parties	http://data.gouv.fr
Controls	
Industry FE	FARE
Firm size	DADS
Capital intensity	FARE and DADS
R&D	DGFIP
Business group	LIFI
Workforce mean age	DADS
Workforce feminization	DADS
High-skilled white-collars	DADS
Skilled white-collars	DADS
Skilled blue-collars	DADS
Unskilled blue-collars	DADS
Employee age	DADS
Employee gender : female	DADS
Employee tenure	DADS
Firm leverage	DADS-Panel
Job position	FARE
Employment conditions	DADS
Employment type	DADS
Contract type	DADS
Foreigner	DADS
Employment zone	DADS





## Chapter 2

# Labor Unions and Income Smoothing

*Abstract :*

I examine the association between unionization and firms' income smoothing. I find evidence that unionized firms tend to smooth less their earnings than non-union firms. More precisely, this effect is concentrated in unionized firms facing low fundamental earnings volatility. This finding suggests that unionized firms avoid reporting too stable reported incomes. I also show that, in firms facing high fundamental earnings volatility, unionization has no effect on income smoothing although income smoothing mitigates the annual pay rises related to the presence of labor unions. This finding suggests that even if income smoothing decreases the risk premium paid to unionized workers, firms with high fundamental earnings volatility have, regardless of the presence of labor unions, similar incentives to smooth their earnings in order to improve their bargaining positions with the various firms' stakeholders. Results are robust to multiple ways to construct income smoothing variables and are confirmed on a subsample of matched firms using propensity score matching (PSM).

This paper empirically studies the association between unionization and income smoothing. Earnings management refers to the managerial discretion over the recognition of revenues and expenses in order to report an income that matches a pre-determined target. Within a reporting period, the target might be a threshold the firm is expected to beat. Evidence of discontinuity in frequency of firm-years around zero earnings, last period earnings and analysts' expectations have been documented [Hayn, 1995, Burgstahler et al., 2006, Degeorge et al., 1999]. The fact that these discontinuities are induced by earnings management was challenged [Dechow et al., 2003, Durtschi and Easton, 2005, Beaver et al., 2007] but evidence that firms are willing to manage earnings in order to meet the three previously cited thresholds was shed in light by a survey interviewing financial executives [Graham et al., 2005] and by empirical works [Roychowdhury, 2003]. Over multiple reporting periods, each period's earnings target can be set in order to keep earnings volatility at a desirable level. Income smoothing involves managing earnings in order to reduce earnings volatility to the extent allowed by accounting and management principles. A firm engages in earnings management to influence the perception of stakeholders such as investors [Roychowdhury, 2003], banks [Jiang, 2008], suppliers [Raman and Shahrur, 2008], labor unions [Bova, 2013]. To which extent earnings management can influence stakeholders is limited by stakeholders' capacities to detect such management. There is evidence that even sophisticated stakeholders such as auditors and institutional investors fail to fully detect accruals management [Bradshaw et al., 2001] and real earnings management [Roychowdhury, 2003]. Reported earnings allow investors to infer the level of permanent future cash flows. The volatility of reported earnings reduces outsiders' confidence in the inferred permanent component of earnings [Kirschenheiter and Melumad, 2002]. Income smoothing increases earnings informativeness [Chaney and Lewis, 1995, Subramanyam, 1996, Tucker and Zarowin, 2006], which reduces firm's perceived risk. Lowering firm's perceived risk has a positive effect on the firm's market value because it increases the firm's bargaining position with outsiders [Trueman and Titman, 1988].

The main contributions of this paper are fourfold. First, this paper shows that unionized firms facing low cash-flows' volatility lower their income smoothing, suggesting that unionized firms try to avoid reporting too stable incomes. Second, this paper gives evidence that unionized firms adjust income smoothing through accruals and not through

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real earnings because the latter does not mitigate labor unions' effects on wages, suggesting that accruals-based income smoothing is less likely to be detected by internal stakeholders such as labor unions. Third, this paper shows that income smoothing behavior is tightly linked with firm's average incomes. The findings suggest that firms use income smoothing in order to report positive and increasing incomes. Last, although union annual pay rise premium is negatively associated with income smoothing in firms facing volatile earnings, these firms do not increase income smoothing when they are unionized, suggesting that stakeholders, other than labor unions, are already giving these firms full incentives to smooth their earnings. This last contribution contradicts findings in [Hamm et al., 2017], which should lead to further theoretical and empirical researches on this topic.

To test the relation between unionization and income smoothing, I use a large sample of French firms from 2009 to 2016. The tight time window of the sample alleviates the concern about estimates averaging effects over several decades as in some other studies. Two variables related to the presence of labor unions are used throughout the paper. The first variable is an indicator variable for the presence of labor unions in the firm. The second one is an ordinal variable indicating the number of different labor unions representing workers within the firm. This second measure proxies the strength of labor unions in the firm because it has been documented that firms' concessions to labor unions' demands are higher in firms where multiple labor unions are in place. To proxy income smoothing behavior, I use six income smoothing variables to gather as much evidence as possible. Four variables proxy accruals-based income smoothing and two variables proxy income smoothing through real earnings management. I use both correlation-based income smoothing variables, constructed as the correlation between the change in (discretionary) accruals, or discretionary expenses, and the change in premanaged earnings following [Tucker and Zarowin, 2006], and volatility-based income smoothing variables, constructed as ratios comparing reported incomes' volatility and premanaged earnings volatility following [Leuz et al., 2003]. In a methodological discussion on income smoothing variables, I provide insight that the volatility-based variables are a necessary complement to correlation-based variables in order to discuss the economic magnitude of the unionization impact on income smoothing and the subsequent effects on wages. I further propose a minor methodological adjustment on the volatility-based variables'

construction, widely used in the literature since [Leuz et al., 2003], when the smoothing variable is intended to be put in interaction with other right-hand variables.

Various robustness checks are performed and all confirm the main contributions. First, I show that income smoothing is mainly driven by the fundamental volatility of earnings, so it should be always controlled for. Throughout the paper, I proxy this fundamental volatility by the volatility of the cash-flows from operations (CFO). Putting the unionization variables in interaction with fundamental earnings volatility proxies, I show that accruals-based income smoothing decreases more in unionized firms as the fundamental earnings volatility decreases. I further split the sample firms in half to run the estimations on subsamples of low and high fundamental earnings volatility firms. The accruals-based income smoothing is weakened only in unionized firms with low fundamental earnings volatility, confirming any previous evidence. Second, I construct a subsample of matched unionized and non-union firms using a propensity-score matching (PSM) to run the estimations on a subsample of comparable firms to alleviate the concern about potential spurious extrapolations. Again, the PSM specifications confirm the findings. Third, I alleviate the concerns about potential bias arising from tax management behavior and earnings management around thresholds. Firms experiencing negative average incomes may have incentives to report some yearly occurrence of positive income, so they have incentives to smooth their earnings less than firms having positive average incomes. Additionally, the earnings threshold related to last year reported income should also give firms with positive average incomes more incentives to smooth their earnings, in order to report positive and growing incomes. Allowing a non-linear relation between average reported income and income smoothing, I show that the effect of average reported income on income smoothing is highly non-linear. If positive average incomes' firms exhibit mostly the same income smoothing behavior, income smoothing decreases gradually below the zero income threshold, the economic magnitude being very large. This last test both links income smoothing behavior to thresholds' management and corroborates the previous findings concerning the unionization effects on income smoothing. Fourth, I run estimations on the effect of unionization on wages to investigate if income smoothing weakens the position of labor unions in the bargaining process with the firm management. All estimates indicate that accruals-based income smoothing decreases the union premium related to annual pay rises in firms facing high

fundamental earnings volatility. Although accruals-based income smoothing weakens labor unions' strength in firms experiencing volatile fundamental earnings, unionized firms do not smooth their earnings more than their non-union counterparts. This finding suggests that these firms, regardless of the presence of labor unions, already have full incentives to smooth their earnings in order to improve their bargaining position with various other stakeholders such as investors, clients and suppliers. Last, in all estimations throughout the paper, it appears that real earnings income smoothing is not different in unionized or non-union firms. This finding suggests that insiders like labor unions may be more likely to detect earnings management schemes than accruals-based ones. Such suggestion is made credible by the finding that real earnings income smoothing does not allow to mitigate the union annual pay rises premium.

This paper contributes to the literature on income smoothing by showing that the presence of labor unions affects the firm's income smoothing behavior. Since the results partially contradict the ones in [Hamm et al., 2017], it should lead to further researches on this recent strand of literature. This paper is also related to firm's perceived risk [Tucker and Zarowin, 2006] affecting firm's bargaining position with its stakeholders [Trueman and Titman, 1988], with a focus on organized labor [Hamm et al., 2017]. This paper also links two strands of literature, the income smoothing [Tucker and Zarowin, 2006] and the earnings thresholds management [Degeorge et al., 1999] ones, by giving evidence that income smoothing may largely be an outcome of the firms' will to report positive and increasing incomes.

The remainder of the paper proceeds as follows. Section 2 develops the research hypotheses. Section 3 describes how the samples and the variables of interests are constructed. Section 4 shows the descriptive statistics, the various results and their interpretations, and section 5 concludes.

## 2.1 Hypothesis development

In a principal-agent perspective, labor unions are the workers' agents. Their goals are to improve the conditions of their principals, the workers. Workers' current conditions include

monetary items such as wages, cash bonuses, employee stock options and profit-sharing plans, and nonmonetary items such as working conditions, benefits in kind, career path and job protection. Labor unions can improve these conditions by obtaining monetary or nonmonetary benefits from the firms' management. Whether labor unions obtain such benefits depends on the results of the bargaining process. To weaken labor unions' position in the bargaining process, the firm's management can improve workers' perception of their current conditions to lower their demands and understate the performance of the firm to persuade workers that the firm cannot accede to their requests. Earnings management can help achieve these two goals. The literature has shown that firms' management understates the performance of firms in unionized firms by holding less cash [Klasa et al., 2009], withholding good news [Chung et al., 2016], lowering managerial pay, dividend and reported income during unions' negotiations [DeAngelo and DeAngelo, 1991], missing earnings targets [Bova, 2013] and decreasing the present value of net cash flows using higher leverage [Bronars and Deere, 1991]. Lowering reported incomes cannot be sustained permanently. On the long-run, there cannot be differences between cash-flow realizations and reported incomes because any accruals have to be reversed after a certain period of time. Any downward (upward) earnings management will decrease (increase) the reported income of the period but will lead to an increase (decrease) of one or more future reported incomes. As a result, lowering earnings is done during specific periods, unions' negotiations, to influence labor unions and weaken their bargaining positions. When contracting with risky firms, stakeholders will ask for compensation because higher bankruptcy risk may decrease the net present value of their residual claims and because they will incur costs to seek another firm to contract with if the firm fails to sustain its activity. Workers are firm's stakeholders that bear significant costs when they become involuntarily unemployed. Workers contracting with risky firms need to receive compensations to accept higher unemployment risk [Agrawal and Matsa, 2013, Chemmanur et al., 2013]. By smoothing income, the firm's management can improve workers' perception of their job protection, which ultimately improves the firm's management's position in the bargaining process with labor unions [Hamm et al., 2017]. Alternatively, unsmoothed earnings are associated with periods of low and high reported earnings. High earnings periods may strengthen labor unions' bargaining position [Matsa, 2010] regardless of firms' permanent earnings.

On the other hand, labor unions may interpret stable earnings as a capacity of the firm to grant more concessions because its performance seems sustainable and job security is taken for granted. It follows that unionized firms may try to avoid both very low and very high earnings volatility. However, income smoothing is not only affected by the presence of labor unions. All stakeholders may influence a firm's income smoothing behavior. If the firm already has incentives to avoid both very low and very high earnings volatility to weaken the bargaining positions of other stakeholders such as investors, clients or suppliers, then, unionization might have no influence on firm's income smoothing behavior.

Hypothesis 1 : Unionized firms facing high (low) fundamental earnings volatility smooth more (less) their incomes.

Hypothesis 2 : Income smoothing in unionized firms facing high (low) fundamental earnings volatility decreases (increases) the union wage premium.

## 2.2 Data

### 2.2.1 Discretionary accruals and discretionary expenses computation

**Sample selection** To compute the discretionary accruals and discretionary expenses, the sample has to be large enough to have sufficient observations for each industry-year regression. To construct the largest possible sample of French firms with available accounting data, I use the French tax administration's database which gathers the firms' annual declarations of financial statements. These declarations give precise and controlled accounting data such as balance sheet and income statement information on all private and public French firms. All firms need to fill these declarations and any error or omission is punishable by law which alleviates the concerns about selection bias or measurement errors. I restrict the sample of firms to commercial firms from the non-financial private sector which discards banks, insurance companies, economic interest groups, associations and foundations. I also restrict the sample to the population of firms from which the data on the presence of labor unions is drawn, keeping firm-year observations spanning the



2009-2016 period and discarding any firm with less than 20 full-time equivalent employees. I further trim the sample dropping firms with total sales less than €1,000,000 because these firms may have suspended their activities. To avoid outliers, I further drop firms that experience increases of more than 100% or decreases of more than 50% in total sales or total assets from one year to the next. Firms switching from one industry to another in the covered period are also removed from the sample. I will refer to this sample as the *Computation sample*. The comprehensiveness of this source should alleviate any concern about selection bias and give credible estimates for the measures of accruals.

**Industry classification** When computing measures of discretionary accruals and discretionary expenses, there is a trade-off between having a large enough number of observations for each regression and allowing the coefficients' estimates of the right-hand variables to vary from one industry to another and from one year to another. On one hand, a pooled regression forces the coefficients' estimates to be the same for all firms regardless of the industry and year, leading to biased estimates of the non-discretionary accruals and expenses and consequently of the discretionary accruals and expenses. On the other hand, defining too many different industries prevents running the regressions because of the lack of observations for each industry or industry-year regression. In this paper, I estimate industry-year regressions for each of the 88 EUROSTAT NACE Rev.2 industries (divisions-level), each year of the covered period (2010 to 2016), using all firms from the *Computation sample*. Industry-year regressions with less than 20 observations are not run because the resulting coefficients' estimates may be questionable. Only the industry-year regressions related to the manufacture of coke and refined petroleum products are dropped because there are only 6 firms in that industry.

**Discretionary accruals computation** I computed discretionary accruals running industry-year regressions on the full *Computation sample*, using the most widely accepted model :

The [Kothari et al., 2005] model :

$$\frac{TA_t}{ATA_t} = \beta_0 + \beta_1 \frac{1}{ATA_t} + \beta_2 \frac{\Delta Sales_t}{ATA_t} + \beta_3 \frac{PPE_t}{ATA_t} + \beta_4 ROA_t + \epsilon$$

The Kothari model is based on the Jones model [Jones, 1991] and adds a performance measure in the industry-year specific regressions in order to correct the miss-specification of the Jones model. Because performance and estimated discretionary accruals of the Jones model exhibit a mechanical relation [Dechow et al., 1995, Kasznik, 1999], adding a performance measure, such as the ROA, allows to correct the miss-specification.

TA refers to total accruals, ATA to average total assets, Sales to total sales, PPE to gross property, plant and equipments, ROA to net income over average total assets following [Kothari et al., 2005, Tucker and Zarowin, 2006].<sup>1</sup> Use of average total assets as the deflator is intended to mitigate heteroskedasticity in residuals. The non-discretionary accruals are the fitted values of the regressions and the discretionary accruals are the residuals.

Total accruals are computed using the French financial statements sent to the tax administration (Cerfas 2050-SD, 2051-SD, 2052-SD and 2053-SD) which do not include statements of cash-flows, so accruals are computed using the indirect approach. This approach uses the balance sheet and the income statement to compute total accruals. Total accruals are often proxied as the change in working capital less depreciation where the change in working capital proxies the current portion of accruals and the depreciation expense proxies the non-current portion of accruals. In the French tax administration data, the expenses related to depreciations, amortizations, impairments and provisions are aggregated so it is not possible to identify the depreciation item. However, since including all non-current accruals will lead to better estimates of total accruals, I propose to compute total accruals as all non-cash items from the income statement plus the change in a modified working capital. The modified working capital is working capital plus current assets' impairments. Since the expenses related to current assets' impairments are already included in the non-cash items from the income statement, the change in working capital must not include

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<sup>1</sup>I obtain similar unreported results using other performance measures such as net income, plus cost of debt less net profit on assets sales, over average total assets. Cost of debt is defined as net of tax (tax shield) interest expenses and net profit on asset sales is defined as net of tax profit and loss on asset sales. Tax rate is supposed to be 33.1/3% for all firms, which is the normal rate that applies for these items in France. There is a trade-off between estimating a tax-rate and not controlling for capital structure to measure performance. Throughout this paper, I use net income over average total assets to avoid estimating tax rates and to allow comparison with all the previous studies that use this ROA definition.

this item, otherwise it would be taken into account twice in the total accruals measure.

$$\begin{aligned} \text{Total accruals} &= \text{all non-cash revenues and expenses} \\ &+ \Delta(\text{working capital} + \text{current assets}' \text{ impairments}) \end{aligned}$$

**Discretionary expenses computation** To investigate income smoothing via real earnings management, I also run industry-year regressions, using the full *Computation sample*, to compute discretionary expenses. In this paper, I proxy discretionary expenses by abnormal selling, general and administrative expenses (SG&A). Expenditures that do not generate immediate revenues are likely to be managed in order to meet an earnings target. SG&A are computed from the French income statements as other external expenses less leasing expenses<sup>2</sup>, so it includes general subcontracting which is not included in COGS (such as security, protection and surveillance), interim staff, maintenance, insurance, commissions, fees, advertising, gifts, travels, receptions, sponsorship, postal, telecommunications, research, studies and documentation expenses.

Following [Dechow et al., 1998] and [Roychowdhury, 2003], I estimate abnormal SG&A expenditures as the residuals of the following industry-year regressions :

$$\frac{SG\&A_t}{ATA_t} = \beta_0 + \beta_1\left(\frac{1}{ATA_t}\right) + \beta_2\left(\frac{Sales_{t-1}}{ATA_t}\right) + \epsilon$$

As in [Roychowdhury, 2003] I express the above model for SG&A expenditures as a linear function of lagged sales to control potential current-year sales manipulation. The normal SG&A expenditures are the fitted values of the regressions and the abnormal SG&A expenditures are the residuals.

### 2.2.2 Income smoothing variables

Income smoothing is the use of earnings management in order to reduce the volatility of the firm's reported income. I define the reported income as the income the firm discloses in its financial statements and the pre-discretionary income (PDI) as the income the firm would have disclosed if no earnings management had happened. A lot of different

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<sup>2</sup>Leasing is subtracted to control for within-industry variation in assets' financing schemes.

income smoothing variables have been used in the literature, but most of them can be classified in two groups. The first group is composed of variables constructed as the ratio of the standard deviation of the reported income over the standard deviation of the pre-discretionary income. The rationale of these variables is that the purpose of income smoothing is to lower the volatility of the reported income. The existence and magnitude of income smoothing can therefore be assessed by comparing the volatilities of the reported income and of the pre-discretionary income. I will refer to these variables as *Volatility-based variables*. The second group is composed of variables constructed as the correlation between the change in the pre-discretionary income and the change in the earnings management items. The rationale of these variables is that if the firm seeks to reduce the volatility of the reported income, the firm must discretionarily increase (decrease) its expenses or decrease (increase) its revenues if the pre-discretionary income increases (decreases). I will refer to these variables as *Correlation-based variables*. Correlation-based variables are widely used in the literature but correlation coefficients are just goodness-of-fit estimators. Pearson's (Spearman's) correlation coefficient assesses the goodness-of-fit of a linear (monotonic) relationship between two variables. As a consequence, if correlation-based variables can capture the existence of income smoothing, they can not determine the magnitude of this smoothing unlike volatility-based variables. In this light, volatility-based variables appear to be indispensable for estimating the economic magnitude of the effect of unionization on income smoothing and the subsequent effects on wages. Correlation-based variables are good as controls to further confirm the findings.

**Volatility-based variables** First, I construct a volatility-based income smoothing variable that relies neither on discretionary accruals nor on discretionary expenses computation. I propose a new variable to the literature, defined as the ratio of the difference between cash-flows from operations' volatility ( $CFO = NI - TA$ ) and net incomes' volatility over cash-flows from operations' volatility :

$$SMOOTH_{VB\_TA} = \frac{\sigma(CFO)_{t-1,t+2} - \sigma(NI)_{t-1,t+2}}{\sigma(CFO)_{t-1,t+2}}$$

This variable allows to assess income smoothing as a percentage of CFO's volatility reduction.

This variable is very similar to [Leuz et al., 2003, Burgstahler et al., 2006], adding just a base correction of "+1" :

$$SMOOTH_{LEUZ} = - \frac{\sigma(NI)_{t-1,t+2}}{\sigma(CFO)_{t-1,t+2}}$$

$$SMOOTH_{VB\_TA} = SMOOTH_{Leuz_t} + 1$$

While this correction often has no consequence on the coefficient estimates of regressions, this correction is not neutral when the smoothing variable is put in interaction with other right-hand variables, which will be the case in the union wage premium estimations. The "+1" correction of the volatility-based income smoothing variable from [Leuz et al., 2003, Burgstahler et al., 2006] allows the variable to take the value "0" when there is no income smoothing. Thus, the coefficient estimate of the variable, which is put in interaction with the income smoothing variable, indicates the effect of this variable when there is no income smoothing. In absence of this "+1" correction, the coefficient estimate of this variable would assess its effect on the dependent variable when the volatility of the reported income is zero, leading to potential misinterpretations.

Second, I construct a similar volatility-based variable using the discretionary accruals (DA) measure. Compared to the previous smoothing variable, CFO' volatility is replaced by the volatility of an estimated pre-discretionary income ( $PDI_{DA} = Net\ Income - DA$ ).

$$SMOOTH_{VB\_DA} = \frac{\sigma(PDI_{DA})_{t-1,t+2} - \sigma(NI)_{t-1,t+2}}{\sigma(PDI_{DA})_{t-1,t+2}}$$

$PDI_{DA}$  is an earnings measure constructed as if no accruals-based earnings management had happened. As a result,  $SMOOTH_{VB\_DA}$  estimates the volatility reduction of net income in percentage of the volatility of earnings before any accruals-based income smoothing.

Last, I construct a volatility-based variable using the discretionary expenses (DE) measure. This variable is defined similarly but the discretionary expenses replace the discretionary accruals in the computation of the pre-discretionary income ( $PDI_{DE} = Net\ Income + DE$ ).

$$SMOOTH_{VB\_DE}_t = \frac{\sigma(PDI_{DE})_{t-1,t+2} - \sigma(NI)_{t-1,t+2}}{\sigma(PDI_{DE})_{t-1,t+2}}$$

$PDI_{DE}$  is an earnings measure constructed as if no real earnings management had happened. As a result,  $SMOOTH_{VB\_DE}$  estimates the volatility reduction of net income

in percentage of the volatility of earnings before any real earnings income smoothing.

In each variable definition,  $t$  refers to given years, and standard deviations are computed using last year's, current year's and the next two years' observations. The use of four observations<sup>3</sup> is a trade-off between having a sufficiently long time-series to compute the income-smoothing measures, keeping a large enough sample size, keeping a tight window around a given year to take into account both unionization status and income smoothing inter-temporal variations, and having a pertinent window size for the union wage premium analysis.

**Correlation-based variables** First, I construct a correlation-based income smoothing variable previously used in the literature that relies neither on discretionary accruals nor on discretionary expenses computation. This variable is computed as the negative of the Pearson's correlation<sup>4</sup> coefficient between the change in cash-flow from operations (CFO) and the change in total accruals (TA), following [Dou et al., 2013].

$$SMOOTH_{CB\_TA} = -\rho(\Delta CFO, \Delta TA)_{t-1, t+2}$$

Income smoothing should lead to a negative correlation coefficient's estimate because the firm decreases (increases) its accruals when the CFO increases (decreases) in order to smooth reported incomes. To assess income smoothing as a positive variable, the variable is constructed as the negative of the correlation coefficient.

Second, I construct a correlation-based variable using the discretionary accruals (DA) measure. This variable is computed as the negative of the Pearson's correlation coefficient between the change in pre-discretionary income ( $PDI_{DA} = Net\ Income - DA$ ) and the change in discretionary accruals (DA), following [Tucker and Zarowin, 2006].

$$SMOOTH_{CB\_DA} = -\rho(\Delta PDI_{DA}, \Delta DA)_{t-1, t+2}$$

A higher  $SMOOTH_{CB\_DA}$  estimate indicates the presence of accruals-based income smoothing, because the firm decreases (increases) discretionary accruals when the pre-discretionary income increases (decreases) in order to smooth reported incomes.

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<sup>3</sup>The use of a five-year rolling window leads to similar unreported results.

<sup>4</sup>Using Spearman's correlations throughout the paper leads to similar unreported results.

Last, I construct a correlation-based variable using the discretionary expenses (DE) measure. This variable is computed as the Pearson's correlation coefficient between the change in pre-discretionary income ( $PDI_{DE} = Net\ Income + DE$ ) and the change in discretionary expenses (DE).

$$SMOOTH_{CB\_DE} = \rho(\Delta PDI_{DE}, \Delta DE)_{t-1, t+2}$$

A higher  $SMOOTH_{CB\_DE}$  estimate indicates the presence of real earnings income smoothing, because the firm increases (decreases) discretionary expenses when the pre-discretionary income increases (decreases) in order to smooth reported incomes.

In each variable definition,  $t$  refers to given years, and correlation's coefficients are computed using last year's, current year's and the next two years' observations. The use of four observations<sup>5</sup> is a trade-off between having a sufficiently long time-series to compute the income-smoothing measures, keeping a large enough sample size, keeping a tight window around a given year to take into account both unionization status and income smoothing inter-temporal variations, and having a pertinent window size for the union wage premium analysis.

### 2.2.3 Samples

**Income smoothing sample** After computing the various income smoothing variables, the database is merged to a labor relations database built from the ACEMO-DSE<sup>6</sup> surveys spanning the period 2009-2015. The ACEMO-DSE survey is a labor relations survey produced every year by the DARES.<sup>7</sup> The ACEMO-DSE survey covers a sample of French firms from the private sector with twenty or more full-time equivalent employees. All French firms of more than 500 employees are covered each year, whereas a representative sample is drawn each year for smaller firms. Any lack of response or intentional error gives rise to an administrative fine in order to ensure the quality of the data. The survey contains various types of information at the firm-level including firm's SIREN (firm's identification code used by the French administration) which ensures perfect matches with

<sup>5</sup>The use of a five-year rolling window leads to similar unreported results.

<sup>6</sup>Activité et conditions d'emploi de la main-d'œuvre - Dialogue social en entreprise.

<sup>7</sup>Direction de l'animation de la recherche, des études et des statistiques, French Ministry of Labor.

the tax administration database, labor representation such as unions' presence, occurrence of strikes and collective agreements. The survey indicates which labor unions have a section, certified or not, in the firm for a given year. The resulting merged sample contains 12,424 firm-year observations. I will refer to this sample as the *Income smoothing sample*.

**Wages sample** To investigate the impact of income smoothing on annual pay rises, I use the most precise data available, using employee-level information from the DADS. The DADS is a social database produced by the INSEE.<sup>8</sup> The DADS is a declaratory formality that all companies with employees must carry out. In the DADS, employers supply, for each employee, various personal and professional information. Thus, I construct a database containing employee-level and firm-level information for all firms from the *Income smoothing sample*. At the employee-level, I gather current and next year wages, current and next year number of hours worked, age, gender, nationality (French, European or from other countries), location where the employee operates (101 départements), job position (28 socio-professional categories), employment conditions (full-time or part-time), employment type (ordinary job, apprenticeship, traineeship, or assisted-job) and type of job contract (unfixed-term, fixed-term, temporary contract, or seasonal employment). At the firm-level, I was able to compute various information about the workforce, such as average age, percentage of female, percentage of French employees, percentage of employees under full-time and fixed-term contracts, and percentage of highly skilled (Intellectual professions and executives) and medium-skilled employees (Intermediary professions). Since the investigation focuses on annual pay rises, I restrict the sample to employees that work at a same firm during the current and next year on an ordinary job under the same job position. The resulting merged sample contains 7,831,673 employee-year observations. I will refer to this sample as the *Wages sample*.

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<sup>8</sup>Institut national de la statistique et des études économiques, French Ministry for the Economy and Finance.



### 2.2.4 Unionization variables

**Variables related to the presence of labor unions** I use two variables to capture labor unions' effects. First, "UNION" is an indicator variable which indicates that there is at least one labor union in the firm. Last, "NB UNIONS" is an ordinal variable indicating the number of different labor unions representing the workforce at the firm-level.

**Union membership** Some may be worried about the lack of control for union membership. In the French case, it is not an important issue. In the US and UK literature, the unionization rate is used as a proxy of union strength and added in the main model. In France, union membership rate is not fundamental to capture labor unions' strength. First, workers benefit from unions bargainings regardless of their union membership status. Second, since all French labor unions, but the CFE-CGC, seek to represent all the workforce, it is as if the entire workforce was a single bargaining unit. As a consequence, even a single labor union with few members can represent all the firm workforce. Last, unions' weight in collective bargainings depends only on the results of the "élections professionnelles" which are disconnected from the number of members of each union. Moreover, union membership status in France is not a public information, which means that only the unions know their members. The value of union membership in any French survey is only an estimation done by a respondent at a workplace-level, based on his beliefs. This decreases the precision of this variable in the French context compared to these of the US and the UK and limits the analysis to single-establishment firms which may raise concerns about small sample bias. Moreover, endogeneity issues may arise because employees' affiliation to labor unions should be more visible by managers when firms' social climate is bad.

Appendice gives definitions for all variables.

## 2.3 Research design and empirical results

### 2.3.1 Unionization and income smoothing

#### 2.3.1.1 Main specifications

**Research design** To investigate the association between the presence of labor unions and the income smoothing behavior of firms, I will estimate various specifications. The first equation to be estimated is the following :

$$\begin{aligned}
 SMOOTH_{it} = & \beta_0 + \beta_1 UNION_{it} + \beta_2 CFOVOL_{it} + \beta_3 SIZE_{it} \\
 & + \beta_4 ROA_{it} + \beta_5 GROWTH_{it} + \beta_6 LEVERAGE_{it} + \beta_7 NOA_{it} \\
 & + \beta_8 CAPEX_{it} + \beta_9 ISSUE_{it} + \beta_{10} DIVIDEND_{it} + \beta_{11} AGE_{it} \\
 & + INDUSTRYFE + YEARFE + \epsilon_{it}
 \end{aligned} \tag{2.1}$$

SMOOTH refers to each smoothing variable defined in the [Income smoothing variables subsection](#). UNION indicates that the firm is unionized. All variables are defined in [Appendice](#).

[Equation 2.1](#) includes various controls that the literature has shown to be associated with income smoothing. CFO' volatility (CFO VOL) is added as a control because firms experiencing dissimilar CFO' volatility should not have the same incentives and ability to smooth their earnings. Stable cash-flow from operations should, without any income smoothing behavior from the firm, lead to stable reported incomes, if the volatility of accruals is assumed to be negligible. Adding this control also alleviates concerns about any potential omitted variable bias arising from labor unions setting up more frequently in firms experiencing particular CFO' volatility. I proxy firm size with the natural logarithm of the number of full-time equivalent (FTE) employees. The number of FTE employees seems more natural as a control than other size variables such as total sales or total assets because the number of employees is more directly associated with the probability of unionization. Using total sales or total assets leads to qualitatively similar unreported results. Larger firms may have more human resources to engage in income smoothing activities and more income smoothing opportunities. ROA and sales growth are added as

controls because low performing firms may have less accounting flexibility. Firms with higher leverage have greater incentives to smooth their reported incomes in order to reduce their costs of debt [Francis et al., 2005]. Since net operating assets (NOA) represent each firm’s accounting flexibility [Barton and Simko, 2002], higher NOA should allow more accrual-based earnings management. I also add a binary variable *ISSUE* indicating that the firm has issued debt or equity in the given year. Income smoothing may be stronger for these firms because income smoothing lowers costs of debt and equity capital [Francis et al., 2004]. A binary variable indicating dividend-paying firms is added because these firms have more incentives to smooth their reported incomes to ensure stable dividends [Liu and Espahbodi, 2014]. Following [Dou et al., 2013], the natural logarithm of firm age and capital expenditures scaled by average total assets are also added. Finally, I add industry and year fixed-effects to control income smoothing trend over time and across industries. All standard errors are clustered at the firm-level to mitigate autocorrelation issues.

In a second specification, I add an interaction term between *UNION* and *CFO*’ volatility to capture whether the unionization’s effect on income smoothing varies with the level of *CFO*’ volatility. The previous model is run again with this added interaction term :

$$\begin{aligned}
SMOOTH_{it} = & \beta_0 + \beta_1 UNION_{it} + \beta_2 CFOVOL_{it} + \beta_3 UNION * CFOVOL_{it} + \beta_4 SIZE_{it} \\
& + \beta_5 ROA_{it} + \beta_6 GROWTH_{it} + \beta_7 LEVERAGE_{it} + \beta_8 NOA_{it} \\
& + \beta_9 CAPEX_{it} + \beta_{10} ISSUE_{it} + \beta_{11} DIVIDEND_{it} + \beta_{12} FIRMAGE_{it} \\
& + INDUSTRYFE + YEARFE + \epsilon_{it}
\end{aligned}
\tag{2.2}$$

**Descriptive statistics** Panel A of Table 2.1 shows the statistics of all variables used in the main specifications of the income smoothing section. The number of firm-year observations of the sample, for which there is at least one smoothing variable computed, is 12,424. The smoothing variables all point out income smoothing behavior. The median of  $SMOOTH_{VB\_TA}$  is 0.5934, showing that net incomes’ volatility is approximately 40% of CFOs’ volatility. The median of  $SMOOTH_{VB\_DA}$  and  $SMOOTH_{VB\_DE}$  are respectively 0.6042 and 0.4403, indicating that discretionary accruals and discretionary expenses are

used to smooth reported income. Economic magnitude of these three volatility-based smoothing variables is large. Correlation-based variables exhibit extremely high values with medians respectively at 0.969, 0.9696 and 0.9032 for the variables constructed upon total accruals, discretionary accruals and discretionary expenses. All in all, income smoothing seems a common phenomenon among the sample firms. Unionization is also a common characteristic with 62.48% of the sample firms being unionized. When a firm is unionized, there are an average of 3 labor unions which operates in. The median (average) size of the firms is 202.25 (796.1) full-time equivalent employees, meaning that the sample is mainly composed of small and medium-sized firms. The labor relation survey design aims to construct a representative sample of the French firms. The income smoothing literature has focused on public firms because of financial data availability. This paper extends the income smoothing literature to private firms which allows to pay more attention to income smoothing happening in small and medium-sized firms. In the sample, the average return on assets, computed as net income over average total assets, is 4.13%, indicating that the average firm is profitable. Average and median CFOs' volatility are 0.0851 and 0.0657. Sales growth is on average positive with an estimate of 3.18% which is superior to the average inflation of the period. Leverage, computed as total debt over average total assets, has a mean of 15.44%. The net operating assets of the average sample firm represent 37.6% of its total sales, but the standard deviation of 0.7543 suggests a high heterogeneity between the sample firms. CAPEX average is 0.0657 indicating that the average firm invests 6.57% of its average total assets value each year. ISSUE is an indicator variable for firms issuing equity or debt. On average 63% of the firms are issuing firms in a given year. Dividend is a binary variable indicating dividend paying firms. Its mean is 0.4811 which indicates that roughly half of the firms are paying dividends. Finally, the median (average) age of sample firms is 27 (31.45) years old.

The correlation coefficients in [Table 2.2](#) show that both unionization variables (UNION and NB UNIONS) are negatively correlated with all income smoothing variables, suggesting that unionized firms may actually engage in less aggressive income smoothing. Correlations between the unionization variables and the covariates are mostly consistent with the literature. Unionization is negatively correlated to performance (ROA), sales growth (GROWTH), and dividend-paying firms (DIVIDEND) but positively correlated to capital

intensity (NOA). Although two covariates' correlations go in the opposite directions of the ones expected (LEVERAGE and ISSUE exhibit respectively negative and positive correlations with unionization), it can be explained by the size heterogeneity of the sample firms. Unionization is far less frequent in small firms which issue less, and leverage in low performing small firms can be mechanically high. CFO' volatility seems to play a determinant role in income smoothing behavior. High positive correlations with accrual-based income smoothing variables but negative correlations with real earnings income smoothing variables suggest that real earnings management may be less efficient to smooth earnings than accruals-based management when earnings are highly volatile. Net income scaled by average total assets (ROA) seems to also play a great role in the income smoothing behavior with high positive correlations with each income smoothing variable. Dividend-paying (DIVIDEND) and sales growth (GROWTH) are also, as expected, positively correlated with income smoothing. Firm size (SIZE) exhibits negative correlations with income smoothing. Firm size is also strongly negatively correlated with CFO' volatility, which may explain that large firms involve in less aggressive income smoothing. Ultimately, multivariate analyses are necessary to disentangle the impact of each variable on income smoothing.

**Results** Table 2.3 shows the results of Equation 2.1 in Panel A and the results of Equation 2.2 in Panel B. Samples sizes vary by income smoothing variables, from 12,424 firm-year observations to 8,476 firm-year observations, because correlation-based income smoothing variables need one more year of data and because industry-year regressions with less than 20 observations are not run when computing discretionary accruals and discretionary expenses.

In Panel A, coefficient estimates on UNION are significantly negative (t statistics between -1.97 and -2.92) for all accruals-based income smoothing variables (columns 1 to 4), indicating that unionized firms tend to engage in less aggressive accruals-based earnings smoothing than their non-union counterparts. Considering the economic magnitude of this difference, on an average firm, the presence of labor unions weakens accruals-based income smoothing which leads to an increase of reported income volatility of 4.69% ( $SMOOTH_{VB\_TA}$ ) or 3.63% ( $SMOOTH_{VB\_DA}$ ) of pre-managed earnings volatility.

The difference between unionized firms and non-union firms does not appear to be statistically significant when investigating real earnings income smoothing (columns 5 and 6), suggesting that firms prefer to modify accruals-based management rather than real earnings management in order to adjust their income smoothing policies in response to the presence of labor unions. Coefficient estimates on the covariates are mostly consistent with the predictions with statistically significant and positive estimates for ROA, GROWTH and DIVIDEND for all income smoothing variables, suggesting that large, profitable and growing firms are more likely to smooth their reported incomes. Large firms and firms with higher NOA and higher leverage tend to engage in more intense accruals-based income smoothing but in less intense real earnings income smoothing. Last, CFO' volatility seems to be the main determinant of income smoothing behavior with extremely high  $t$  statistics (from -10.16 to 29.15) and high economic magnitude. Assuming an average firm, a one standard-deviation increase in CFO' volatility implies that accruals-based earnings management will strengthen, mitigating the increase in reported income volatility by 21.21%<sup>9</sup> ( $SMOOTH_{VB\_TA}$ ) or 14.79%<sup>10</sup> ( $SMOOTH_{VB\_DA}$ ) of pre-managed earnings volatility. Real earnings income smoothing will weaken, magnifying the increase in reported income volatility by 4.84%<sup>11</sup> ( $SMOOTH_{VB\_DE}$ ) of pre-managed earnings volatility. An increase in fundamental earnings volatility will be mitigated by both accruals-based and real earnings income smoothing, but there is a substitution effect between the two types of income smoothing as earnings volatility increases. The rationale underlying this substitution effect is that the percentage of earnings volatility that real earnings can smooth decreases as volatility increases because of the growing economic costs incurred. Ultimately, if some firm characteristics only affect one type of income smoothing (accruals-based or real earnings income smoothing), some affect both types of income smoothing in the same direction and some others affect both types of income smoothing but in opposite directions leading to substitution effects.

In [Panel B](#), the union indicator variable is put in interaction with CFO' volatility. Coefficient estimates on UNION, CFO VOL and their interaction term are all statistically

<sup>9</sup>On average,  $[\frac{-\sigma(NI)_{t-1,t+2}}{\sigma(CFO)_{t-1,t+2}} + 1]$  is higher by  $[2.9911 * 0.0709 = 0.2121]$

<sup>10</sup>On average,  $[\frac{-\sigma(NI)_{t-1,t+2}}{\sigma(CFO)_{t-1,t+2}} + 1]$  is higher by  $[2.0859 * 0.0709 = 0.1479]$

<sup>11</sup>On average,  $[\frac{-\sigma(NI)_{t-1,t+2}}{\sigma(CFO)_{t-1,t+2}} + 1]$  is lower by  $[(-0.6820) * 0.0709 = 0.0484]$

significant at the 1% level for accruals-based income smoothing (columns 1 to 4). Economic magnitude of the coefficients indicates that unionized firms with CFO' volatility lower than approximately 0.15<sup>12</sup> smooth less than their non-union counterparts, while unionized firms with CFO' volatility higher than 0.15 smooth more than non-union firms. Among the sample firms, a CFO' volatility of 0.15 is high, being 0.92<sup>13</sup> standard deviation higher than the sample mean. Moreover, since the relation between the interaction term and the dependent variable is linear in this specification, these findings suggest that the negative effect of unionization on accruals-based income smoothing highlighted in [Panel A](#) is concentrated in firms having low volatility CFO.

### 2.3.1.2 Additional CFO specifications

**CFO Subsamples** In the main specifications, it appears that CFO volatility is a main driver of the effect of unionization on income smoothing. I propose to split the sample firms in half, one subsample is composed of firms having the lowest CFO' volatility and another one is composed of firms having the highest CFO' volatility. I estimate [Equation 2.2](#) on both subsamples to gather further evidence of CFO' volatility being a key determinant of the effect of unionization on income smoothing. Additionally, it will allow to capture potential non linearity of UNION and the interaction term (UNION \* CFO VOL) between the two subsamples.

Panels A and B of [Table 2.4](#) show the results. While the coefficient estimates on columns 1 to 4 from Panel A remain statistically significant and even increase in economic magnitude compared to the full sample estimates, they all become statistically insignificant and their economic magnitude plummet in Panel B. These results indicate that the effect of unionization on income smoothing is through accruals-based earnings management and is restricted to firms with low CFO' volatility.

<sup>12</sup>Computed estimates, from columns 1 to 4, vary from 14.18% to 17.66%. For example, computation for  $SMOOTH_{VB\_TA}$  is as follows :  $[\frac{0.1206}{0.8269} = 14.58]$ .

<sup>13</sup>Computation is as follows :  $[\frac{0.15-0.0851}{0.0709} = 0.92]$ .

**CFO Interaction** In the main specifications, the interaction between unionization and CFO's volatility is constrained to be linear ( $UNION * CFO VOL$ ). In this additional specification, I split the distribution of CFO VOL in quartiles to compute new variables ( $CFO VOL: Q\#$ ), in order to identify very low, low, high, and very high CFO' volatility firms. The resulting CFO' volatility quartiles indicator variables are put in interaction with the UNION variable. The choice of quartiles is a trade-off between identifying enough dissimilar groups, having enough observations in each group and results readability. Using quintile leads to similar unreported results. The resulting specification will allow to check the potential non-linearity in the interaction between unionization and CFO's volatility on income smoothing. The following model is estimated :

$$\begin{aligned}
SMOOTH_{it} = & \beta_0 + \beta_1 UNION_{it} + \beta_2 CFO VOL : Q2_{it} + \beta_3 CFO VOL : Q3_{it} + \beta_4 CFO VOL : Q4_{it} \\
& + \beta_5 UNION_{it} * CFO VOL : Q2_{it} + \beta_6 UNION_{it} * CFO VOL : Q3_{it} + \beta_7 UNION_{it} * CFO VOL : Q4_{it} \\
& + \beta_8 SIZE_{it} + \beta_9 ROA_{it} + \beta_{10} GROWTH_{it} + \beta_{11} LEVERAGE_{it} \\
& + \beta_{12} NOA_{it} + \beta_{13} CAPEX_{it} + \beta_{14} ISSUE_{it} + \beta_{15} DIVIDEND_{it} + \beta_{16} FIRM AGE_{it} \\
& + INDUSTRY FE + YEAR FE + \epsilon_{it}
\end{aligned} \tag{2.3}$$

Panel C of [Table 2.4](#) shows that the negative association between unionization and accruals-based income smoothing is largely restricted to firms experiencing very low CFO' volatility, coefficient estimates of  $UNION * CFO VOL : Q2$  having an absolute value very close to the  $UNION$  estimate. F-tests confirm that the coefficient estimates' sum is not statistically different from zero. Unionized firms in the first quartile of CFO' volatility distribution increase their reported income volatility by 16.61% ( $SMOOTH_{VB\_TA}$ ) or 10.66% ( $SMOOTH_{VB\_DA}$ ) of pre-managed earnings volatility compared to their non-union counterparts. It appears that unionized firms may try to avoid reporting too stable incomes.

### 2.3.1.3 Multi-unionism

I extend the analysis by testing a proxy for labor unions' strength. Multi-unionism in France leads to higher wages and greater occurrence of strikes, suggesting that multi-unionism is associated with a stronger bargaining position for labor unions. Replacing the



UNION variable by an ordinal variable, NB UNIONS, indicating the number of different labor unions within the firm will allow to take into account labor unions' strength. In order to allow interactions between NB UNIONS and CFO' volatility, I construct an indicator variable, splitting the sample firms in half, which identifies low and high CFO' volatility firms. I estimate the following models :

$$\begin{aligned}
SMOOTH_{it} = & \beta_0 + \beta_1 NB\ UNIONS_{it} + \beta_2 CFO\ VOL_{it} \\
& + \beta_3 SIZE_{it} + \beta_4 ROA_{it} + \beta_5 GROWTH_{it} + \beta_6 LEVERAGE_{it} \\
& + \beta_7 NOA_{it} + \beta_8 CAPEX_{it} + \beta_9 ISSUE_{it} + \beta_{10} DIVIDEND_{it} + \beta_{11} FIRM\ AGE_{it} \\
& + INDUSTRY\ FE + YEAR\ FE + \epsilon_{it}
\end{aligned} \tag{2.4}$$

$$\begin{aligned}
SMOOTH_{it} = & \beta_0 + \beta_1 NB\ UNIONS_{it} + \beta_2 CFO\ VOL : HI_{it} + \beta_3 NB\ UNIONS_{it} * CFO\ VOL : HI_{it} \\
& + \beta_4 SIZE_{it} + \beta_5 ROA_{it} + \beta_6 GROWTH_{it} + \beta_7 LEVERAGE_{it} \\
& + \beta_8 NOA_{it} + \beta_9 CAPEX_{it} + \beta_{10} ISSUE_{it} + \beta_{11} DIVIDEND_{it} + \beta_{12} FIRM\ AGE_{it} \\
& + INDUSTRY\ FE + YEAR\ FE + \epsilon_{it}
\end{aligned} \tag{2.5}$$

Table 2.5 reports the coefficient estimates of Equation 2.4 in panel A and the ones of Equation 2.5 in panel B.

Coefficient estimates in both Panels of Table 2.5 indicate that the pattern shed in light in Table 2.3 remains. In Panel A, statistical significance of the coefficient estimates on NB UNIONS in columns 1 to 4, which investigate accruals-based income smoothing, is even larger with t statistics between (-3.50) and (-5.12). Again, the presence of labor unions has no significant impact on real earnings income smoothing (columns 5 and 6). Each additional labor union decreases income smoothing leading to an increase in reported income volatility of 2.95% ( $SMOOTH_{VB\_TA}$ ) or 2.08% ( $SMOOTH_{VB\_DA}$ ) of pre-managed earnings volatility. In Panel B, results confirm that unionized firms experiencing low CFO' volatility are involved in less intense income smoothing with an increased reported income of 4.07% ( $SMOOTH_{VB\_TA}$ ) or 2.67% ( $SMOOTH_{VB\_DA}$ ) of pre-managed earnings volatility for each additional labor union. Finally, it appears that firms facing labor unions smooth less their reported incomes when pre-managed earnings have a low volatility.

#### 2.3.1.4 Tax & threshold management

The literature has shown that unionization lowers profitability. It should therefore be expected that unionized firms more often exhibit negative net incomes (negative average ROA) than their non-union counterparts. If firms that exhibit negative net incomes have incentives to smooth less their reported incomes and if the relationship between net income scaled by average total assets (ROA), which is used as a covariate, and income smoothing is not linear, it could lead to downward bias on the coefficient estimates of the variables related to the presence of labor unions.

There are at least two reasons why negative net incomes firms should smooth less their reported incomes than other firms. First, in France, corporate tax is calculated upon the net income with some minor adjustments. If these adjustments are assumed to be, on average, centered around zero, then net income is a good proxy for tax base. As a result, negative net incomes firms should have incentives to smooth less in order to use their tax loss carryback and carryforward, because these tax receivables and tax liabilities reductions suffer time and amount limitations. Last, [Hayn, 1995, Burgstahler et al., 2006, Degeorge et al., 1999, Graham et al., 2005, Roychowdhury, 2003] have shown that firms manage earnings in order to report positive and increasing incomes. Firms reporting negative net incomes should have incentives to smooth less in order to report some yearly occurrences of positive net incomes, while firms reporting positive net incomes should have incentives to smooth more in order to report positive and increasing incomes because high reported incomes' volatility should induce some yearly occurrences of decreasing (negative) reported incomes.

To alleviate these concerns, I create an ordinal variable (ROA : POS(NEG)), constructed upon the average ROA (net income scaled by average total assets) over the 4 years rolling window on which income smoothing is computed, which splits the sample firms in ten groups, five groups for negative income firms and five groups for positive income firms.<sup>14</sup> This ordinal ROA variable will replace the continuous current-year ROA variable in the following models, allowing to precisely control for non-linearity of the effect of the average performance of the firm on income smoothing. I estimate the following models :

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<sup>14</sup>The chosen bins to identify groups are : -0.1, -0.05, -0.02, -0.01, 0, 0.01, 0.02, 0.05, 0.1.

$$\begin{aligned}
SMOOTH_{it} = & \beta_0 + \beta_1 (UNION \text{ or } NB \text{ UNIONS})_{it} + \beta_2 CFO \text{ VOL}_{it} + \beta_3 SIZE_{it} \\
& + \beta_4 ROA(-\infty; -0.1)_{it} + \beta_5 ROA(-0.1; -0.05)_{it} + \beta_6 ROA(-0.05; -0.02)_{it} \\
& + \beta_7 ROA(-0.02; -0.01)_{it} + \beta_8 ROA(-0.01; 0)_{it} + \beta_9 ROA(0.01; 0.02)_{it} \\
& + \beta_{10} ROA(0.02; 0.05)_{it} + \beta_{11} ROA(0.05; 0.1)_{it} + \beta_{12} ROA(0.1; \infty)_{it} \\
& + \beta_{13} GROWTH_{it} + \beta_{14} LEVERAGE_{it} + \beta_{15} NOA_{it} \\
& + \beta_{16} CAPEX_{it} + \beta_{17} ISSUE_{it} + \beta_{18} DIVIDEND_{it} + \beta_{19} FIRM \text{ AGE}_{it} \\
& + INDUSTRY \text{ FE} + YEAR \text{ FE} + \epsilon_{it}
\end{aligned} \tag{2.6}$$

Table 2.6 reports the coefficient estimates of Equation 2.6. Panel A includes the indicator variable UNION, while Panel B includes the ordinal variable NB UNIONS. All evidence concerning the effect of unionization on income smoothing from Table 2.3 and Table 2.5 are confirmed. In both Panels, F-tests confirm that each negative income coefficient estimate is statistically lower than the one of the closer better performing group. The drop in income smoothing starts around the zero net income threshold, income smoothing behavior being mostly similar for all positive net incomes firms, confirming the expectation that negative income firms have incentives to engage in less aggressive income smoothing. Considering Panel A<sup>15</sup>, on average, compared to a firm which has a positive average net income scaled over total assets (ROA) between 0% and 0.01%, a firm which has a negative average ROA between -0.01% and 0% decreases its accruals-based and real earnings income smoothing, resulting in an increase of its reported income volatility of approximately 20% of pre-managed earnings volatility. The economic magnitudes of these findings are extremely high considering that the two bins chosen around the zero threshold are very tight, which further confirms the predictions. Tightness of the two bins around zero should also alleviate the concerns about the two groups not being comparable.

### 2.3.1.5 Propensity-score matching

To avoid the extrapolation issue involved with regressions, I assess the differences in the distributions of the covariates used in the income smoothing models, between unionized

<sup>15</sup>Similar results are found using Panel B coefficient estimates.

and non-union firms, using the two main indicators used in the literature : the standardized bias and the variance ratio of residuals. As shown in Panel C and Figure (a) of [Table 2.7](#), high differences between the unionized firms and the non-union firms are found in the full sample, which may cast doubt on possible extrapolation issues. To address this issue, I use a propensity-score matching [[Rosenbaum and Rubin, 1983](#)] in order to construct a subsample composed of comparable unionized and non-union firms. Using a one-to-one nearest neighbour without replacement matching based on the propensity-score within a caliper of 0.05, I obtain a resulting matched sample containing 3,846 firm-year observations. A test is run again to confirm that the differences between unionized and non-union firms in the matched sample are now negligible with covariates variance ratios of residuals between 0.4 and 2 and standardized bias between -9 and +4, a Pseudo R<sup>2</sup> from probit estimation of the conditional treatment probability of 0.008 and a corresponding P-values of the likelihood-ratio test of the joint significance of all the regressors of 0.999, mean bias of 1.7 and median bias of 1.4, an absolute standardized difference of the means of the linear index of the propensity-score in the treated and non-treated group (Rubin's B) of 20.8 and a ratio of treated to non-treated variances of the propensity score index (Rubin's R) of 0.82. All these tests indicate that the non-union and unionized firms of the matched sample have comparable covariates distribution.

[Equation 2.1](#) and [Equation 2.4](#) are run again on the matched sample to control for remaining heterogeneities. As shown in [Table 2.7](#), the coefficient estimates on the unionization variables, for accruals-based income smoothing (columns 1 to 4), obtained on the matched sample, are similar to the ones obtained on the full sample, in terms of statistical significance (t-statistics range, on the full sample, from -1.97 to -2.92 for UNION and from -3.5 to -5.12 for NB UNIONS, while they range from -2.50 to -3.16 for UNION and from -2.34 to -3.60 for NB UNIONS on the matched sample) and economic magnitude (coefficient estimates for volatility-based income smoothing variables range, on the full sample, from -0.0363 to -0.0469 for UNION and from -0.0208 to -0.0295 for NB UNIONS, while they range from -0.0469 to -0.0603 for UNION and from -0.0222 to -0.0319 for NB UNIONS on the matched sample), confirming the previous results. No evidence is found, on the matched sample, concerning any unionization effect on real earnings income smoothing, which corroborates previous findings that only accruals-based income smoothing is adjusted when

the firm is unionized. These results alleviate the concern about potential bias induced by inaccurate OLS extrapolations that could arise when treated firms are not comparable with non-treated firms. Previous results are confirmed.

## **2.3.2 Income smoothing and wages**

### **2.3.2.1 Base result**

To investigate the association between income smoothing, unionization and annual pay rises, I estimate a dynamic Mincer model using micro-data at the employee-level. These models, widely used in the economic literature, allow to control for both inter-firms workforce composition heterogeneities and intra-firms inter-temporal workforce composition variations, leading to more credible coefficient estimates on the variables of interest. As usual in dynamic Mincer models, the dependent variable is the natural logarithm of the hourly wage of next year. Lagged dependent variable is added as a control to capture current year wage level. In addition to the variables of interests (UNION, CFO VOL and SMOOTH), various firm-level and employee-level covariates are added to control for firms' and employees' characteristics that affect wages evolution. A performance measure calculated after deduction of current wages is added (ROA) in order to capture the capacity of the firm to increase current wages. Net operating assets (NOA) is added because it has been documented that capital intensive firms are more likely to make wages concessions to labor unions because of the ex-post hold up on sunk costs related to specific firms' assets. Since growing firms should have more possibilities to increase wages, I further control for sales growth (GROWTH). Firms' workforce composition variables are added as controls because firms with dissimilar workforce may not follow the same wages policies, even if they operate in the same NACE Rev.2 A88 industry. Workforce composition variables are computed using all the firm's job contracts, each employee-level observation being weighted depending on its full-time equivalent. The workforce percentage of intellectual professions and executives (Workforce : HI HC) and the workforce percentage of intermediary professions (Workforce : MED HC) are added to control for human capital level in the firms. The workforce percentages of employees holding full-time contracts and

permanent contracts are added to control for the commitment and involvement employees may have with the firm. The percentage of French employees among the workforce, the average age of the workforce and its feminization rate is added because it could be expected that these variables play a role in the workforce bargaining power. Similar employee-level indicator variables are added, such as gender (female), nationality (Foreigner : Europe and Foreigner : Others), permanent and full-time job contract. Three employee-level fixed effects are added, age, job position (28 socio-professional categories), and workplace location (101 départements, administrative French zones) to capture the non-linear effect of age on annual pay rises, the effect of the job position which proxies education and skills, and the location where the employee operates to capture the spatial wages heterogeneities. Finally, industry and year fixed effects are added. The sample is composed of 7,831,673 employee-firm-year observations, representing a comprehensive sample of the employees that have been holding a job contract in the sample firms during current and next year.

Panel B of [Table 2.1](#) shows summary statistics of the employee-level variables. Job position being a categorical variable taking 28 values, I regroup employees in five categories to ease the table's readability. On average, wages increase from one year to the next, the mean of  $LN HW_{t+1}$  being higher than the mean of  $LN HW_t$ . In the wages sample, 40.09% of the employees are female, while 93.39% have the French nationality, 95.62% hold a permanent job contract and 80.68% hold a full-time job contract. Average age is 41.4715 years old. 40% of the employees in the sample are holding a human capital intensive job position, 27% are low and unskilled white-collars and 32.45% are blue-collars. The high mean on the permanent job contract variable is explained by the sample being restricted to employees that are under contract over two consecutive civil years. The firm-level variables, unreported in the summary statistics' table, are computed on the full sample of the firms' employees, each year, so they do not suffer this bias.

In the income smoothing models, each firm has the same weight in the regressions. Using a comprehensive sample of the employee job contracts, the wages regressions on the full-sample will end up giving a lot more weight to the very large firms. Some firms have just a few dozen observations in the wages sample while others have more than 100,000 observations. To deal with this issue and still benefit from all the information of

these comprehensive micro-data, I use weighted least squares (WLS) for all estimations. In the wages sample, 75% of the firms have at least 52 yearly observations. I decide to affect a weight of "1" to observations coming from firms where there are 52 or less observations for the given year, and a weight of " $\frac{52}{\text{number of firms observations for the given year}}$ " to observations coming from firms where there are more than 52 observations for the given year. Alternatively, using random sampling, average results estimated on 500 random samples composed of a maximum of 52 observations per firm for each year give qualitatively similar unreported results. The following model is estimated :

$$\begin{aligned}
 LN\ HW_{ei(t+1)} = & \beta_0 + \beta_1 UNION_{it} + \beta_2 SMOOTH_{it} + \beta_3 UNION_{it} * SMOOTH_{it} \\
 & + \beta_4 LN\ HW_{eit} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 NOA_{it} + \beta_8 GROWTH_{it} \\
 & + \beta_9 Workforce : HI\ HC_{it} + \beta_{10} Workforce : MED\ HC_{it} + \beta_{11} Workforce : Full-time_{it} \\
 & + \beta_{12} Workforce : Permanent_{it} + \beta_{13} Workforce : French_{it} + \beta_{14} Workforce : Age_{it} \\
 & + \beta_{15} Workforce : Gender_{it} + \beta_{16} GENDER_{eit} + \beta_{17} Foreigner : Europe_{eit} \\
 & + \beta_{18} Foreigner : Others_{eit} + \beta_{19} Permanent_{eit} + \beta_{20} Full-time_{eit} \\
 & + AGE\ FE_{eit} + Job\ position\ FE_{eit} + Workplace\ location\ FE_{eit} + INDUSTRY\ FE + YEAR\ FE + \epsilon_{it}
 \end{aligned}
 \tag{2.7}$$

Table 2.8 shows the results of Equation 2.7. Coefficient estimates on the UNION indicator variable are mostly significant with an average economic magnitude of (+0.0056) indicating that the wages in unionized firms increase more than in non-union firms, with a union annual pay rise premium of 0.56% of current year wages. The economic magnitude is small but plausible. None of the coefficient estimates related to SMOOTH or UNION \* SMOOTH is statistically significant, suggesting that, on average, income smoothing fails to reduce the union annual pay rise premium. Concerning the other right-hand variables, they all confirm the expectations. Lagged dependent variable is, as expected, highly significant (t statistics between 109.41 and 140.25), and its economic magnitude is high (approximately 80%) confirming the autoregressive characteristic of wages. Large firms (SIZE) with human capital intensive workforces (Workforce : HI HC and Workforce : MED HC) and committed workforces (Workforce : Full-time and Workforce : Permanent) increase wages more than others. Interestingly, the average age (Workforce : Age) and feminization rate (Workforce : Gender) of the workforce seem to have no impact on annual pay rises. Moreover, performing (ROA) and growing (GROWTH) firms with high capital intensity (NOA) also increase wages more. At the employee-level, women and employees from non-European countries (proxy for unskilled foreign workers) have lower annual

pay rises while employees from other European countries (proxy for skilled expatriate employees) have higher annual pay rises. Finally, employees holding fixed-term or part-time job contracts have higher annual pay rises, which can be explain by the premium attached to job insecurity. The extremely high adjusted  $R^2$  suggests that the model fits well the data at hand.

### 2.3.2.2 CFO sub-samples

Since the income smoothing behavior largely depends on the volatility of cash-flows, I split the sample firms in half based on the distribution of CFO' volatility in order to identify high and low CFO' volatility firms. I run [Equation 2.7](#) separately on both sub-samples to investigate any difference between these two groups of firms. Panels A and B of [Table 2.9](#) report the coefficient estimates respectively for low CFO' volatility firms and high CFO' volatility firms. In Panel A, coefficient estimates related to the presence of labor unions, income smoothing and their interaction are close to zero and not statistically significant, suggesting that unionization does not, on average, capture annual pay rise premium in mature firms. On the contrary, in Panel B, for the accruals-based specifications in columns 1 to 4, coefficient estimates on UNION are positive (from 0.0117 to 0.0136) and statistically different from zero. The interaction terms with the income smoothing variables are also statistically different from zero but negative (from -0.0120 to -0.0148). As expected, the coefficient estimates for SMOOTH are close to zero and never statistically different from zero, meaning that reported incomes' volatility has no impact on wages in non-union firms. These results indicate that labor unions are able to obtain more wage concessions in firms that exhibit high fundamental earnings volatility. In these firms, union pay rise premium can be reduced by reporting more stable incomes using accruals-based earnings management. The coefficient estimates for the real earnings income smoothing specifications indicate that this type of income smoothing does not allow to decrease the labor unions bargaining power. It might be that this kind of income smoothing is easier to monitor because labor unions have access to inside information about the firm real expenditures.



### 2.3.2.3 Multi-unionism

Again, I extend the analysis by testing a proxy for labor unions' strength. Multi-unionism in France leading to higher wages, I investigate whether income smoothing allows to decrease annual pay rises related to multi-unionism. I replace the indicator variable UNION by the ordinal variable NB UNIONS, which indicates the number of different labor unions within the firm. I estimate the following model :

$$\begin{aligned}
 LN\ HW_{ei(t+1)} = & \beta_0 + \beta_1 NB\ UNIONS_{it} + \beta_2 SMOOTH : HI_{it} + \beta_3 NB\ UNIONS_{it} * SMOOTH : HI_{it} \\
 & + \beta_4 LN\ HW_{eit} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 NOA_{it} + \beta_8 GROWTH_{it} \\
 & + \beta_9 Workforce : HI\ HC_{it} + \beta_{10} Workforce : MED\ HC_{it} + \beta_{11} Workforce : Full-time_{it} \\
 & + \beta_{12} Workforce : Permanent_{it} + \beta_{13} Workforce : French_{it} + \beta_{14} Workforce : Age_{it} \\
 & + \beta_{15} Workforce : Gender_{it} + \beta_{16} GENDER_{eit} + \beta_{17} Foreigner : Europe_{eit} \\
 & + \beta_{18} Foreigner : Others_{eit} + \beta_{19} Permanent_{eit} + \beta_{20} Full-time_{eit} \\
 & + AGE\ FE_{eit} + Job\ position\ FE_{eit} + Workplace\ location\ FE_{eit} + INDUSTRY\ FE + YEAR\ FE + \epsilon_{it}
 \end{aligned}
 \tag{2.8}$$

Panel A of [Table 2.10](#) shows the results of [Equation 2.9](#) estimated on the full sample. All coefficient estimates for NB UNIONS are unambiguously positive and statistically significant at the 1% level, confirming that the number of labor unions plays a great role in labor unions' bargaining position. Each additional labor union induces an annual increase of wages of 0.3%. Income smoothing coefficient estimates are non conclusive on the full sample.

Panel B and C of [Table 2.10](#) show the results of [Equation 2.9](#) estimated on the subsamples of firms having respectively low CFO' volatility and high CFO' volatility. In both panels the coefficient estimates for SMOOTH : HI are close to zero and not statistically significant, confirming previous finding that reported incomes volatility does not matter in non-union firms. In both panels NB UNIONS exhibits positive and significant estimates corroborating that the more labor unions there are in a firm, the higher the annual pay rises. Contrary to the UNION specification, when controlling for the number of labor unions, it seems that there is a union premium even in low CFO volatility firms. It could be explained by non-linearity of the impact of NB UNIONS on wages. If few labor unions are not capable of increasing wages in a low CFO' volatility firm but more labor unions can, and if the sample of firms is largely composed of firms having few labor unions, then the estimate on UNION can be non significant while the one on NB UNIONS will. High accruals-based

income smoothing mitigates the union premium in high CFO' volatility firms but not in low CFO' volatility firms. It is not surprising that lowering reported incomes volatility, when pre-managed earnings are already stable, has less impact on the outcome.

## 2.4 Conclusion

This paper examines how firms adjust their income smoothing behavior when they face labor unions. While high fundamental earnings volatility should lead to higher compensations' demands because of the higher perceived job insecurity, very stable earnings should increase unions' confidence in the capacity of the firm's management to concede to their demands. Using a large sample of firms, covering the period 2009-2016, this study investigates both accruals-based and real earnings income smoothing and shows that if unionized firms adjust discretionary accruals to modify their income smoothing behavior, they do not adjust real earnings expenses. Complementary evidence on union wage premium show that real earnings income smoothing has no effect on the union wage premium, which explains the previous finding. Insiders, such as labor unions, may be more likely to detect earnings management through real expenditures.

This paper also suggests that firms use income smoothing as a way to report positive and increasing incomes, linking income smoothing to earnings thresholds management. Moreover, I provide evidence that unionized firms avoid reporting very stable earnings. However, wage analyses do not explain such behavior because it is shown that income smoothing never increases the union wage premium even in low volatile earnings firms. Future research focusing on strikes or social climate may show if this particular behavior is driven by firms looking for labor peace. Concerning the unionized firms facing high fundamental earnings volatility, no difference in income smoothing is observed. Although this finding contradicts previous findings in the literature, this result is credible. Income smoothing is a response to stakeholders' perception of the performance of firms in an environment of information asymmetry. Since income smoothing allows firms to weaken the bargaining position of other stakeholders, such as investors, clients and suppliers, there is no reason to believe that weakening labor unions would require more income smoothing

than weakening other stakeholders. However, the literature on this topic is very scarce and may require more theoretical and empirical investigations.

## 2.5 Tables

Table 2.1: Summary statistics

This table reports the descriptive statistics of variables from both the Income smoothing sample and the Wage sample. All continuous variables are winzored at the 1st and 99th percentiles. [Appendice](#) gives definitions for all variables.

Panel A : Summary statistics of the Income smoothing sample							
Variable	count	mean	sd	skewness	p50	min	max
<i>SMOOTH</i> <sub>VB_TA</sub>	12424	0.3844	0.67	-2.6928	0.5934	-3.0247	0.9762
<i>SMOOTH</i> <sub>CB_TA</sub>	8500	0.8492	0.3035	-3.2492	0.969	-0.6741	0.9999
<i>SMOOTH</i> <sub>VB_DA</sub>	12386	0.4487	0.5282	-2.2482	0.6042	-2.0272	0.9759
<i>SMOOTH</i> <sub>CB_DA</sub>	8476	0.8447	0.3173	-3.2405	0.9696	-0.7237	0.9999
<i>SMOOTH</i> <sub>VB_DE</sub>	12386	0.3554	0.4711	-1.3805	0.4403	-1.5913	0.9685
<i>SMOOTH</i> <sub>CB_DE</sub>	8477	0.7023	0.4362	-1.9602	0.9032	-0.8387	0.9999
UNION	12424	0.6248	0.4842	-0.5157	1	0	1
NB UNIONS	12424	1.8661	1.9516	0.7793	1	0	10
NB UNIONS (if UNION=1)	7763	2.9866	1.658	0.5542	3	1	10
CFO VOL	12424	0.0851	0.0709	1.9918	0.0657	0.0064	0.4005
SIZE	12424	5.366	1.4269	0.3166	5.3095	3.0445	8.9438
ROA	12424	0.0413	0.0873	-0.4548	0.0394	-0.3437	0.3534
GROWTH	12424	0.0318	0.1145	0.7871	0.0231	-0.2895	0.4852
LEVERAGE	12424	0.1544	0.1733	1.4026	0.0928	0	0.7741
NOA	12424	0.376	0.7543	4.8783	0.1998	-0.3889	5.3743
CAPEX	12424	0.0657	0.0849	2.8727	0.0376	0	0.5166
ISSUE	12424	0.6302	0.4828	-0.5392	1	0	1
DIVIDEND	12424	0.4811	0.4997	0.0757	0	0	1
FIRM AGE	12424	3.2362	0.6775	-0.3691	3.2958	1.3863	4.7274

Panel B : Summary statistics of the Wages sample							
Variable	count	mean	sd	skewness	p50	min	max
<i>LN HW</i> <sub>t+1</sub>	7,831,673	2.916	0.4534	1.0377	2.822	-0.6686	10.2485
<i>LN HW</i> <sub>t</sub>	7,840,413	2.8726	0.447	0.9498	2.7829	-2.1235	9.9535
Gender	7,840,413	0.4009	0.4901	0.4044	0	0	1
Foreigner : Europe	7,840,413	0.0178	0.1321	7.302	0	0	1
Foreigner : Outside Europe	7,840,413	0.0483	0.2145	4.2122	0	0	1
Permanent	7,840,413	0.9562	0.2046	-4.4603	1	0	1
Full-time	7,840,413	0.8068	0.3948	-1.5545	1	0	1
Age	7,840,413	41.4715	10.8542	0.0156	42	16	80
Job position : Senior Executives	7,840,413	0.0029	0.0534	18.6302	0	0	1
Job position : Intellectual professions and Executives	7,840,413	0.2093	0.4068	1.4294	0	0	1
Job position : Intermediary professions	7,840,413	0.1932	0.3948	1.5539	0	0	1
Job position : Other white-collar workers	7,840,413	0.2701	0.444	1.0353	0	0	1
Job position : Blue-collar workers	7,840,413	0.3245	0.4682	0.7498	0	0	1

Table 2.2: Correlations Table

This table shows the correlation coefficients for the variables in the smoothing sample. Pearson correlations are presented above the diagonal and Spearman correlations are presented below the diagonal. All continuous variables are winzored at the 1st and 99th percentiles. [Appendix](#) gives definitions for all variables.

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)	(N)	(O)	(P)	(Q)	(R)
<i>SMOOTH<sub>V</sub>_T<sub>A</sub></i>	1	0.968	0.747	0.747	0.432	0.334	-0.079	-0.099	0.382	-0.059	0.090	0.102	0.008	-0.050	-0.039	-0.005	0.110	0.011
<i>SMOOTH<sub>V</sub>_D<sub>A</sub></i>	0.872	1	0.707	0.757	0.442	0.344	-0.073	-0.089	0.335	-0.048	0.090	0.106	0.014	-0.028	-0.037	-0.001	0.120	0.010
<i>SMOOTH<sub>C</sub>_T<sub>A</sub></i>	0.559	0.445	1	0.932	0.306	0.365	-0.063	-0.083	0.264	-0.042	0.098	0.089	-0.002	-0.046	-0.034	-0.003	0.123	-0.002
<i>SMOOTH<sub>C</sub>_D<sub>A</sub></i>	0.654	0.605	0.770	1	0.324	0.379	-0.069	-0.087	0.237	-0.039	0.107	0.100	0.015	-0.024	-0.027	0.002	0.139	0.006
<i>SMOOTH<sub>V</sub>_D<sub>E</sub></i>	0.250	0.263	0.152	0.163	1	0.721	-0.033	-0.031	-0.090	-0.014	0.047	0.087	-0.099	-0.147	-0.074	-0.007	0.066	-0.036
<i>SMOOTH<sub>C</sub>_D<sub>E</sub></i>	0.203	0.215	0.208	0.223	0.546	1	-0.047	-0.055	-0.098	-0.038	0.064	0.064	-0.095	-0.140	-0.084	-0.012	0.094	-0.047
UNION	-0.088	-0.085	-0.060	-0.069	-0.025	-0.038	1	0.869	-0.098	0.673	-0.124	-0.039	-0.109	0.085	0.133	0.091	-0.047	0.083
NB UNIONS	-0.108	-0.096	-0.073	-0.079	-0.015	-0.039	0.747	1	-0.117	0.772	-0.138	-0.055	-0.138	0.078	0.132	0.089	-0.046	0.075
CFO VOL	0.266	0.230	0.127	0.124	-0.093	-0.128	-0.057	-0.073	1	-0.170	-0.041	-0.024	-0.028	-0.225	-0.029	-0.029	-0.127	-0.098
SIZE	-0.065	-0.057	-0.032	-0.040	-0.012	-0.039	0.657	0.762	-0.129	1	-0.112	0.003	-0.097	0.080	0.176	0.123	0.026	0.120
ROA	0.157	0.143	0.148	0.177	0.051	0.098	-0.127	-0.130	-0.136	-0.115	1	0.219	-0.196	0.010	0.012	-0.084	0.456	-0.013
GROWTH	0.087	0.088	0.068	0.089	0.066	0.060	-0.033	-0.049	-0.025	0.003	0.180	1	0.012	-0.049	0.128	0.009	0.062	-0.049
LEVERAGE	0.017	0.022	-0.042	0.000	-0.093	-0.085	-0.052	-0.073	-0.015	-0.064	-0.215	-0.003	1	0.354	0.198	0.176	-0.061	0.076
NOA	-0.008	0.010	-0.024	0.003	-0.050	-0.048	0.113	0.130	-0.175	0.085	-0.005	-0.012	0.436	1	0.231	0.120	0.034	0.170
CAPEX	-0.003	-0.006	-0.007	-0.008	-0.022	-0.027	0.079	0.079	0.035	0.100	-0.020	0.093	0.158	0.134	1	0.154	0.011	0.071
ISSUE	-0.003	0.003	-0.016	-0.006	0.001	-0.008	0.091	0.083	-0.021	0.122	-0.075	0.018	0.150	0.102	0.141	1	0.021	0.060
DIVIDEND	0.127	0.129	0.140	0.142	0.049	0.087	-0.047	-0.041	-0.146	0.030	0.400	0.039	-0.099	0.032	-0.026	0.021	1	0.079
FIRM AGE	0.014	0.011	-0.017	-0.002	-0.030	-0.032	0.074	0.057	-0.086	0.107	-0.004	-0.042	0.057	0.147	0.024	0.060	0.081	1

Table 2.3: Income smoothing : main specifications

This table reports the OLS regression results on the relation between the presence of labor unions and income smoothing.

Dependent variable : Income smoothing variables. Panel A shows the base specification. Panel B shows the interaction specification where UNION is put in interaction with CFO volatility. [Appendix](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	2.9911*** (29.15)	0.7696*** (14.17)	2.0859*** (24.83)	0.8293*** (14.43)	-0.6820*** (-10.16)	-0.7967*** (-8.53)
<b>UNION</b>	<b>-0.0469***</b> <b>(-2.92)</b>	<b>-0.0186**</b> <b>(-1.97)</b>	<b>-0.0363***</b> <b>(-2.81)</b>	<b>-0.0203**</b> <b>(-2.07)</b>	<b>-0.0153</b> <b>(-1.26)</b>	<b>0.0035</b> <b>(0.27)</b>
SIZE	0.0157** (2.49)	0.0074** (2.11)	0.0108** (2.14)	0.0076** (2.01)	-0.0077* (-1.66)	-0.0176*** (-3.42)
ROA	0.9039*** (7.98)	0.4326*** (7.22)	0.6446*** (7.23)	0.6189*** (8.46)	0.0620 (1.08)	0.3049*** (3.50)
GROWTH	0.3181*** (5.77)	0.1164*** (3.65)	0.2714*** (6.34)	0.1568*** (4.57)	0.2384*** (7.19)	0.1478*** (3.89)
LEVERAGE	0.1162** (2.40)	-0.0258 (-0.90)	0.0980** (2.53)	0.0554* (1.92)	-0.1115*** (-3.24)	-0.0122 (-0.29)
NOA	0.0189 (1.37)	0.0035 (0.50)	0.0200* (1.73)	0.0066 (1.00)	-0.0222*** (-2.59)	-0.0337*** (-2.93)
CAPEX	-0.0739 (-0.90)	0.0181 (0.40)	-0.0717 (-1.10)	-0.0043 (-0.09)	0.0436 (0.84)	0.0844 (1.37)
ISSUE	-0.0086 (-0.67)	-0.0063 (-0.94)	-0.0065 (-0.65)	-0.0029 (-0.42)	0.0088 (0.97)	0.0033 (0.33)
DIVIDEND	0.1589*** (11.13)	0.0657*** (8.62)	0.1242*** (11.05)	0.0623*** (7.53)	0.0275*** (2.78)	0.0416*** (3.63)
FIRM AGE	0.0224* (1.93)	-0.0108* (-1.71)	0.0110 (1.24)	-0.0042 (-0.62)	-0.0192*** (-2.63)	-0.0196** (-2.20)
Constant	-0.0959* (-1.70)	0.7553*** (24.62)	0.1210*** (2.65)	0.7147*** (22.13)	0.5070*** (12.46)	0.8725*** (18.43)
Industry & Year FE	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.150	0.081	0.127	0.102	0.097	0.088
<b>Panel B</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	2.4571*** (18.90)	0.5552*** (7.08)	1.8178*** (16.36)	0.6184*** (7.80)	-0.6217*** (-5.81)	-0.7782*** (-5.88)
<b>UNION</b>	<b>-0.1206***</b> <b>(-4.66)</b>	<b>-0.0485***</b> <b>(-3.54)</b>	<b>-0.0733***</b> <b>(-3.56)</b>	<b>-0.0497***</b> <b>(-3.42)</b>	<b>-0.0070</b> <b>(-0.42)</b>	<b>0.0061</b> <b>(0.31)</b>
<b>UNION * CFO VOL</b>	<b>0.8269***</b> <b>(4.50)</b>	<b>0.3421***</b> <b>(3.39)</b>	<b>0.4151***</b> <b>(2.70)</b>	<b>0.3367***</b> <b>(3.22)</b>	<b>-0.0934</b> <b>(-0.70)</b>	<b>-0.0297</b> <b>(-0.17)</b>
SIZE	0.0168*** (2.66)	0.0079** (2.24)	0.0113** (2.24)	0.0081** (2.13)	-0.0078* (-1.69)	-0.0177*** (-3.42)
ROA	0.9227*** (8.09)	0.4402*** (7.36)	0.6542*** (7.29)	0.6264*** (8.55)	0.0598 (1.04)	0.3043*** (3.49)
GROWTH	0.3188*** (5.79)	0.1162*** (3.65)	0.2717*** (6.35)	0.1566*** (4.57)	0.2383*** (7.19)	0.1478*** (3.89)
LEVERAGE	0.1131** (2.34)	-0.0269 (-0.94)	0.0964** (2.49)	0.0543* (1.89)	-0.1112*** (-3.23)	-0.0121 (-0.28)
NOA	0.0200 (1.45)	0.0036 (0.51)	0.0206* (1.78)	0.0067 (1.02)	-0.0223*** (-2.61)	-0.0337*** (-2.93)
CAPEX	-0.0754 (-0.92)	0.0198 (0.44)	-0.0724 (-1.11)	-0.0026 (-0.06)	0.0438 (0.85)	0.0843 (1.37)
ISSUE	-0.0071 (-0.56)	-0.0058 (-0.86)	-0.0058 (-0.58)	-0.0024 (-0.35)	0.0086 (0.96)	0.0032 (0.32)
DIVIDEND	0.1583*** (11.10)	0.0656*** (8.62)	0.1238*** (11.03)	0.0622*** (7.52)	0.0275*** (2.78)	0.0416*** (3.63)
FIRM AGE	0.0221* (1.90)	-0.0111* (-1.74)	0.0109 (1.22)	-0.0045 (-0.65)	-0.0192*** (-2.63)	-0.0196** (-2.20)
Constant	-0.0525 (-0.91)	0.7735*** (24.85)	0.1428*** (3.09)	0.7325*** (22.36)	0.5021*** (12.20)	0.8709*** (18.30)
Industry & Year FE	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.148	0.080	0.126	0.101	0.097	0.088

Table 2.4: Income smoothing : additional CFO specifications

This table reports the OLS regression results on the relation between the presence of labor unions and income smoothing.

Dependent variable : Income smoothing variables. Panel A (B) shows the results of the specification from Panel B of Table 3.3, run on the sub-sample of low (high) CFO volatility firms. In Panel C, firms are splitted into 4 quartiles depending on their CFO volatility (Q1 : very low ; Q4 : very high) in order to allow interactions and investigate non linearity. [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A : Low CFO volatility</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	14.8024*** (12.33)	2.8593*** (5.35)	9.9910*** (11.11)	2.6763*** (4.83)	-1.6088** (-2.40)	-1.7172** (-2.43)
UNION	-0.2407*** (-3.39)	-0.0573* (-1.79)	-0.1370*** (-2.61)	-0.0780** (-2.30)	-0.0060 (-0.16)	0.0088 (0.23)
UNION * CFO VOL	4.3541*** (2.86)	0.9846 (1.41)	2.1558* (1.91)	1.4521** (1.97)	-0.0739 (-0.09)	-0.0300 (-0.03)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	6215	4363	6195	4349	6195	4350
Adjusted R-squared	0.217	0.103	0.170	0.133	0.095	0.067
<b>Panel B : High CFO volatility</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	0.7533*** (6.86)	0.1690* (1.74)	0.4367*** (4.08)	0.1497 (1.58)	-0.6300*** (-4.42)	-0.8283*** (-4.53)
UNION	-0.0229 (-0.88)	-0.0149 (-0.76)	-0.0021 (-0.09)	-0.0120 (-0.64)	-0.0422 (-1.44)	-0.0117 (-0.31)
UNION * CFO VOL	0.1346 (0.91)	0.0376 (0.30)	-0.0234 (-0.16)	0.0247 (0.21)	0.1298 (0.72)	0.0992 (0.39)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	6209	4137	6191	4127	6191	4127
Adjusted R-squared	0.088	0.065	0.083	0.075	0.098	0.100
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel C : CFO VOL Quartiles</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL : Q2	0.3411*** (10.83)	0.0810*** (5.04)	0.2421*** (9.72)	0.0747*** (4.44)	-0.0225 (-1.09)	-0.0494** (-2.38)
CFO VOL : Q3	0.4971*** (16.52)	0.1124*** (7.13)	0.3836*** (16.25)	0.1230*** (7.78)	-0.0345* (-1.69)	-0.0543*** (-2.70)
CFO VOL : Q4	0.5908*** (19.40)	0.1313*** (7.77)	0.4554*** (18.78)	0.1444*** (8.55)	-0.0850*** (-3.99)	-0.1204*** (-5.44)
UNION	-0.1661*** (-4.41)	-0.0487*** (-2.66)	-0.1066*** (-3.71)	-0.0622*** (-3.21)	0.0083 (0.39)	0.0054 (0.26)
UNION * CFO VOL : Q2	0.1424*** (3.42)	0.0131 (0.62)	0.0893*** (2.75)	0.0423* (1.88)	-0.0131 (-0.51)	0.0139 (0.52)
UNION * CFO VOL : Q3	0.1497*** (3.72)	0.0461** (2.28)	0.0926*** (2.97)	0.0599*** (2.84)	-0.0457* (-1.73)	-0.0123 (-0.45)
UNION * CFO VOL : Q4	0.2019*** (4.97)	0.0627*** (2.93)	0.1140*** (3.59)	0.0687*** (3.09)	-0.0391 (-1.45)	-0.0093 (-0.31)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.209	0.096	0.187	0.121	0.094	0.083

Table 2.5: Income smoothing : number of labor unions

This table reports the OLS regression results on the relation between the number of labor unions and income smoothing.

Dependent variable : Income smoothing variables. Panel A shows the base specification. Panel B shows the interaction specification where NB UNION is put in interaction with CFO volatility. In order to allow the interaction between NB UNION (ordinal variable) and CFO VOL (continuous variable), the firms are splitted into 2 quantiles depending on their CFO volatility (LOW and HIGH). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A : Base specification</b>						
	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	3.0029*** (29.16)	0.7735*** (14.25)	2.0934*** (24.87)	0.8323*** (14.46)	-0.6817*** (-10.16)	-0.7954*** (-8.52)
NB UNIONS	<b>-0.0295***</b> <b>(-5.12)</b>	<b>-0.0120***</b> <b>(-4.12)</b>	<b>-0.0208***</b> <b>(-4.54)</b>	<b>-0.0108***</b> <b>(-3.50)</b>	<b>-0.0044</b> <b>(-1.13)</b>	<b>-0.0019</b> <b>(-0.42)</b>
SIZE	0.0356*** (4.72)	0.0155*** (4.07)	0.0242*** (3.98)	0.0142*** (3.41)	-0.0065 (-1.22)	-0.0150** (-2.48)
ROA	0.9047*** (8.01)	0.4312*** (7.21)	0.6458*** (7.26)	0.6183*** (8.46)	0.0639 (1.11)	0.3035*** (3.48)
GROWTH	0.3000*** (5.44)	0.1097*** (3.44)	0.2587*** (6.05)	0.1509*** (4.40)	0.2367*** (7.14)	0.1461*** (3.84)
LEVERAGE	0.1033** (2.14)	-0.0319 (-1.12)	0.0890** (2.30)	0.0503* (1.74)	-0.1126*** (-3.27)	-0.0141 (-0.33)
NOA	0.0226 (1.62)	0.0049 (0.70)	0.0225* (1.93)	0.0078 (1.17)	-0.0220** (-2.57)	-0.0332*** (-2.89)
CAPEX	-0.0801 (-0.97)	0.0170 (0.37)	-0.0757 (-1.16)	-0.0050 (-0.11)	0.0433 (0.84)	0.0839 (1.36)
ISSUE	-0.0097 (-0.76)	-0.0067 (-1.01)	-0.0074 (-0.74)	-0.0034 (-0.49)	0.0086 (0.95)	0.0033 (0.33)
DIVIDEND	0.1553*** (10.97)	0.0642*** (8.45)	0.1218*** (10.86)	0.0610*** (7.41)	0.0273*** (2.76)	0.0411*** (3.60)
FIRM AGE	0.0206* (1.77)	-0.0118* (-1.86)	0.0097 (1.10)	-0.0051 (-0.75)	-0.0194*** (-2.66)	-0.0199** (-2.22)
Constant	-0.1741*** (-2.94)	0.7259*** (23.09)	0.0672 (1.40)	0.6896*** (20.67)	0.4988*** (11.79)	0.8653*** (17.84)
Industry and Year fixed effects	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.150	0.082	0.128	0.102	0.097	0.088
<b>Panel B : Interaction</b>						
	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL : HI	0.3789*** (23.87)	0.0907*** (10.17)	0.3018*** (23.65)	0.1031*** (11.28)	-0.0468*** (-3.94)	-0.0570*** (-4.20)
NB UNIONS	<b>-0.0407***</b> <b>(-5.32)</b>	<b>-0.0163***</b> <b>(-4.49)</b>	<b>-0.0267***</b> <b>(-4.49)</b>	<b>-0.0151***</b> <b>(-3.89)</b>	<b>0.0007</b> <b>(0.16)</b>	<b>0.0010</b> <b>(0.19)</b>
NB UNIONS * CFO VOL : HI	<b>0.0268***</b> (3.78)	<b>0.0105***</b> (2.77)	<b>0.0141**</b> (2.56)	<b>0.0105***</b> (2.66)	<b>-0.0122***</b> (-2.58)	<b>-0.0079</b> (-1.41)
SIZE	0.0374*** (4.98)	0.0158*** (4.14)	0.0270*** (4.49)	0.0147*** (3.54)	-0.0053 (-0.98)	-0.0130** (-2.15)
ROA	0.7732*** (7.04)	0.3821*** (6.43)	0.5539*** (6.53)	0.5664*** (7.89)	0.0910 (1.55)	0.3625*** (4.05)
GROWTH	0.2780*** (5.08)	0.1061*** (3.32)	0.2441*** (5.79)	0.1469*** (4.31)	0.2424*** (7.27)	0.1504*** (3.94)
LEVERAGE	0.0832* (1.73)	-0.0411 (-1.44)	0.0724* (1.88)	0.0400 (1.40)	-0.1110*** (-3.20)	-0.0103 (-0.24)
NOA	0.0198 (1.40)	0.0043 (0.61)	0.0237** (1.96)	0.0075 (1.11)	-0.0183** (-2.14)	-0.0274** (-2.39)
CAPEX	-0.0784 (-0.96)	0.0209 (0.47)	-0.0827 (-1.29)	-0.0013 (-0.03)	0.0335 (0.65)	0.0660 (1.08)
ISSUE	-0.0117 (-0.92)	-0.0060 (-0.90)	-0.0091 (-0.92)	-0.0026 (-0.37)	0.0087 (0.96)	0.0028 (0.28)
DIVIDEND	0.1522*** (10.87)	0.0646*** (8.56)	0.1222*** (11.12)	0.0618*** (7.56)	0.0304*** (3.07)	0.0438*** (3.81)
FIRM AGE	0.0175 (1.52)	-0.0123* (-1.95)	0.0083 (0.95)	-0.0056 (-0.81)	-0.0180** (-2.46)	-0.0186** (-2.07)
Constant	-0.1142* (-1.96)	0.7412*** (23.29)	0.0778* (1.66)	0.7017*** (20.98)	0.4532*** (10.84)	0.8156*** (16.93)
Industry and Year fixed effects	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.154	0.085	0.146	0.108	0.092	0.080



Table 2.6: Income smoothing : tax &amp; threshold management

This table reports the OLS regression results on the relation between the presence of labor unions and income smoothing.

Dependent variable : Income smoothing variables. In this table, current ROA is substituted by the average ROA over the 4 year smoothing window. This average ROA variable is defined as an ordinal variable allowing to control for non linearity around the zero-income threshold (positive income threshold management) and for non linearity between negative and positive average taxable incomes (use of tax loss carryforward). In panel A, the variable of interest is the presence of at least one labor union (UNION). In panel B, the variable of interest is the exact number of labor unions in the firm (NB UNIONS). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A : Unionization</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
<b>UNION</b>	<b>-0.0329**</b> (-2.18)	<b>-0.0146</b> (-1.57)	<b>-0.0270**</b> (-2.22)	<b>-0.0164*</b> (-1.70)	<b>-0.0103</b> (-0.87)	<b>0.0084</b> (0.64)
CFO VOL	3.6984*** (33.18)	0.9689*** (16.81)	2.6236*** (30.92)	1.0729*** (17.59)	-0.4040*** (-5.98)	-0.5729*** (-6.13)
ROA (-∞; -0.1)	-1.0123*** (-18.96)	-0.3200*** (-10.08)	-0.7513*** (-20.29)	-0.4080*** (-11.30)	-0.3710*** (-13.05)	-0.3174*** (-7.38)
ROA (-0.1 ; -0.05)	-0.6776*** (-14.66)	-0.2081*** (-7.68)	-0.5216*** (-14.06)	-0.2288*** (-7.88)	-0.3457*** (-13.09)	-0.2523*** (-6.87)
ROA (-0.05 ; -0.02)	-0.5378*** (-13.33)	-0.1891*** (-8.03)	-0.4195*** (-13.07)	-0.1795*** (-7.60)	-0.2814*** (-10.83)	-0.1874*** (-6.18)
ROA (-0.02 ; -0.01)	-0.4206*** (-9.13)	-0.1089*** (-4.26)	-0.3534*** (-9.09)	-0.1024*** (-4.33)	-0.2277*** (-7.82)	-0.1159*** (-3.55)
<b>ROA (-0.01 ; 0)</b>	<b>-0.2085***</b> (-6.00)	<b>-0.0636***</b> (-2.94)	<b>-0.1815***</b> (-6.28)	<b>-0.0463**</b> (-2.19)	<b>-0.1654***</b> (-6.50)	<b>-0.0546**</b> (-1.99)
ROA (0.01 ; 0.02)	-0.0474* (-1.76)	-0.0106 (-0.71)	-0.0287 (-1.30)	-0.0099 (-0.66)	-0.0495** (-2.33)	-0.0026 (-0.11)
ROA (0.02 ; 0.05)	-0.0193 (-0.82)	-0.0014 (-0.10)	-0.0216 (-1.06)	0.0070 (0.52)	-0.0762*** (-4.07)	-0.0149 (-0.76)
ROA (0.05 ; 0.1)	-0.0489** (-2.01)	-0.0176 (-1.23)	-0.0534** (-2.56)	-0.0003 (-0.02)	-0.1072*** (-5.60)	-0.0307 (-1.48)
ROA (0.1 ; +∞)	-0.1865*** (-6.80)	-0.0607*** (-3.81)	-0.1796*** (-7.65)	-0.0487*** (-3.02)	-0.2045*** (-9.56)	-0.0861*** (-3.65)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.243	0.122	0.216	0.150	0.131	0.112
<b>Panel B : Number of unions</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
<b>NB UNIONS</b>	<b>-0.0210***</b> (-3.91)	<b>-0.0096***</b> (-3.40)	<b>-0.0146***</b> (-3.37)	<b>-0.0081***</b> (-2.68)	<b>-0.0014</b> (-0.37)	<b>0.0008</b> (0.18)
CFO VOL	3.7030*** (33.16)	0.9705*** (16.83)	2.6260*** (30.90)	1.0737*** (17.57)	-0.4049*** (-5.99)	-0.5722*** (-6.12)
ROA (-∞; -0.1)	-1.0078*** (-18.89)	-0.3185*** (-10.04)	-0.7485*** (-20.22)	-0.4069*** (-11.29)	-0.3713*** (-13.04)	-0.3171*** (-7.37)
ROA (-0.1 ; -0.05)	-0.6759*** (-14.64)	-0.2075*** (-7.64)	-0.5207*** (-14.03)	-0.2285*** (-7.86)	-0.3459*** (-13.10)	-0.2520*** (-6.87)
ROA (-0.05 ; -0.02)	-0.5372*** (-13.27)	-0.1894*** (-8.04)	-0.4191*** (-13.03)	-0.1799*** (-7.60)	-0.2817*** (-10.84)	-0.1871*** (-6.17)
ROA (-0.02 ; -0.01)	-0.4178*** (-9.10)	-0.1076*** (-4.22)	-0.3514*** (-9.06)	-0.1011*** (-4.29)	-0.2273*** (-7.82)	-0.1164*** (-3.56)
<b>ROA (-0.01 ; 0)</b>	<b>-0.2093***</b> (-6.03)	<b>-0.0646***</b> (-2.98)	<b>-0.1823***</b> (-6.30)	<b>-0.0472**</b> (-2.23)	<b>-0.1656***</b> (-6.51)	<b>-0.0544**</b> (-1.98)
ROA (0.01 ; 0.02)	-0.0470* (-1.74)	-0.0113 (-0.75)	-0.0284 (-1.28)	-0.0103 (-0.69)	-0.0495** (-2.33)	-0.0027 (-0.12)
ROA (0.02 ; 0.05)	-0.0201 (-0.85)	-0.0022 (-0.16)	-0.0222 (-1.09)	0.0063 (0.47)	-0.0762*** (-4.08)	-0.0150 (-0.76)
ROA (0.05 ; 0.1)	-0.0490** (-2.02)	-0.0181 (-1.27)	-0.0534** (-2.57)	-0.0007 (-0.05)	-0.1072*** (-5.60)	-0.0307 (-1.48)
ROA (0.1 ; +∞)	-0.1857*** (-6.78)	-0.0609*** (-3.82)	-0.1789*** (-7.62)	-0.0486*** (-3.02)	-0.2042*** (-9.55)	-0.0864*** (-3.66)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	12424	8500	12386	8476	12386	8477
Adjusted R-squared	0.245	0.123	0.217	0.151	0.131	0.112

Table 2.7: Income smoothing : propensity-score matching

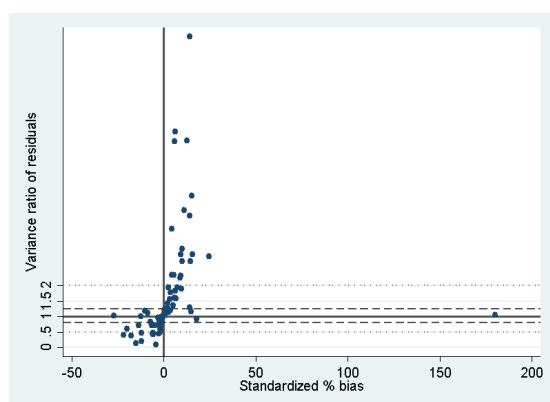
This table reports the OLS regression results on the relation between the presence of labor unions and income smoothing on a subsample of matched firms.

The matching is a one-to-one nearest neighbour without replacement matching based on the propensity-score within a caliper of 0.05. Dependent variable : Income smoothing variables. In panel A, the variable of interest is the presence of at least one labor union (UNION). In panel B, the variable of interest is the exact number of labor unions in the firm (NB UNIONS). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

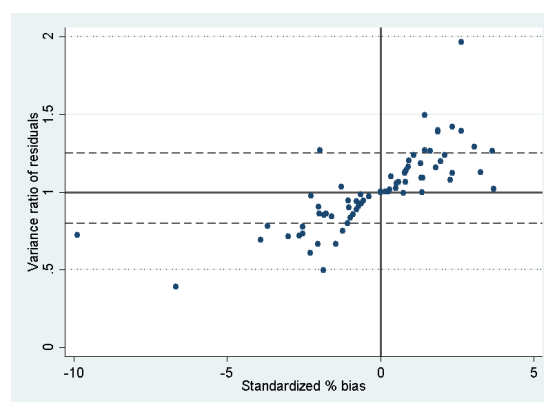
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A : Unionization</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	2.5987*** (17.62)	0.6600*** (7.41)	1.8364*** (14.97)	0.6878*** (7.59)	-0.6723*** (-5.92)	-0.7822*** (-5.40)
UNION	-0.0603*** (-3.16)	-0.0280** (-2.50)	-0.0469*** (-3.05)	-0.0265** (-2.36)	-0.0187 (-1.26)	-0.0162 (-1.03)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	3846	2549	3843	2547	3843	2547
Adjusted R-squared	0.137	0.084	0.114	0.091	0.099	0.081
<b>Panel B : Number of unions</b>	<i>SMOOTH<sub>VB_TA</sub></i>	<i>SMOOTH<sub>CB_TA</sub></i>	<i>SMOOTH<sub>VB_DA</sub></i>	<i>SMOOTH<sub>CB_DA</sub></i>	<i>SMOOTH<sub>VB_DE</sub></i>	<i>SMOOTH<sub>CB_DE</sub></i>
CFO VOL	2.6070*** (17.66)	0.6604*** (7.42)	1.8415*** (15.01)	0.6886*** (7.60)	-0.6693*** (-5.88)	-0.7821*** (-5.39)
NB UNIONS	-0.0319*** (-3.60)	-0.0117** (-2.34)	-0.0222*** (-3.05)	-0.0132** (-2.57)	-0.0106 (-1.56)	-0.0061 (-0.92)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	3846	2549	3843	2547	3843	2547
Adjusted R-squared	0.138	0.084	0.115	0.092	0.099	0.081

## Full sample and matched sample variables heterogeneity

<b>Panel C : Variables heterogeneity</b>	Ps R2	LR chi2	p>chi2	Mean Bias	Med Bias	B	R
Full sample	0.467	7652.24	0.000	9.0	5.6	200.2	1.81
Matched sample	0.008	41.73	0.999	1.7	1.4	20.8	0.82



(a) Full sample variables  
heterogeneity



(b) Matched sample variables  
heterogeneity

Table 2.8: Wage model : base specification

This table reports the OLS regression results of a dynamic Mincer model estimating the relations between unionization, income smoothing and pay rises.

Dependent variable : Next year natural logarithm of the hourly wage. Dynamic model : lagged dependent variable is added in the right-hand to capture current wage level. In (1) and (2) SMOOTH is respectively SMOOTH\_VB\_TA and SMOOTH\_CB\_TA (total accruals smoothing variables). In (3) and (4) SMOOTH is respectively SMOOTH\_VB\_DA and SMOOTH\_CB\_DA (discretionary accruals smoothing variables). In (5) and (6) SMOOTH is respectively SMOOTH\_VB\_DEXP and SMOOTH\_CB\_DEXP (discretionary expenses smoothing variables). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>LN HW<sub>T+1</sub></i>	<i>LN HW<sub>T+1</sub></i>	<i>LN HW<sub>T+1</sub></i>	<i>LN HW<sub>T+1</sub></i>	<i>LN HW<sub>T+1</sub></i>	<i>LN HW<sub>T+1</sub></i>
SMOOTH	0.0006 (0.39)	-0.0020 (-0.50)	0.0007 (0.40)	-0.0027 (-0.62)	-0.0012 (-0.57)	0.0055 (1.49)
UNION	<b>0.0046**</b> <b>(2.57)</b>	<b>0.0045</b> <b>(1.00)</b>	<b>0.0052***</b> <b>(2.67)</b>	<b>0.0064</b> <b>(1.32)</b>	<b>0.0041**</b> <b>(2.03)</b>	<b>0.0089**</b> <b>(2.01)</b>
UNION * SMOOTH	<b>-0.0020</b> <b>(-1.17)</b>	<b>0.0000</b> <b>(0.01)</b>	<b>-0.0029</b> <b>(-1.34)</b>	<b>-0.0020</b> <b>(-0.41)</b>	<b>-0.0009</b> <b>(-0.33)</b>	<b>-0.0058</b> <b>(-1.28)</b>
<i>LN HW<sub>T</sub></i>	0.7905*** (140.25)	0.7998*** (109.96)	0.7901*** (139.60)	0.7994*** (109.41)	0.7901*** (139.66)	0.7995*** (109.99)
FIRM SIZE	0.0036*** (6.26)	0.0035*** (4.94)	0.0035*** (6.20)	0.0035*** (4.91)	0.0035*** (6.22)	0.0034*** (4.86)
Workforce : HI HC	0.0624*** (11.43)	0.0579*** (9.59)	0.0625*** (11.41)	0.0578*** (9.55)	0.0627*** (11.45)	0.0580*** (9.57)
Workforce : MED HC	0.0176*** (3.35)	0.0149** (2.53)	0.0176*** (3.35)	0.0150** (2.55)	0.0178*** (3.37)	0.0154*** (2.61)
Workforce : Full-time	0.0581*** (8.13)	0.0539*** (6.12)	0.0581*** (8.12)	0.0541*** (6.14)	0.0580*** (8.11)	0.0537*** (6.08)
Workforce : Permanent	0.0204*** (3.02)	0.0118 (1.53)	0.0204*** (3.02)	0.0119 (1.53)	0.0203*** (3.01)	0.0119 (1.53)
Workforce : French	0.0025 (0.45)	-0.0003 (-0.04)	0.0025 (0.45)	-0.0006 (-0.08)	0.0025 (0.45)	-0.0003 (-0.05)
Workforce : Age	0.0002 (0.92)	-0.0001 (-0.49)	0.0002 (0.89)	-0.0001 (-0.52)	0.0002 (0.99)	-0.0001 (-0.45)
Workforce : Gender	-0.0019 (-0.43)	0.0002 (0.03)	-0.0017 (-0.39)	0.0003 (0.07)	-0.0017 (-0.39)	0.0004 (0.08)
ROA	0.0410*** (5.38)	0.0331*** (3.57)	0.0413*** (5.41)	0.0353*** (3.83)	0.0406*** (5.29)	0.0321*** (3.45)
NOA	0.0033*** (3.65)	0.0043*** (4.37)	0.0033*** (3.65)	0.0044*** (4.39)	0.0032*** (3.56)	0.0043*** (4.32)
GROWTH	0.0229*** (4.73)	0.0287*** (4.92)	0.0228*** (4.72)	0.0289*** (4.94)	0.0229*** (4.73)	0.0281*** (4.80)
Gender	-0.0249*** (-34.66)	-0.0243*** (-27.62)	-0.0250*** (-34.62)	-0.0244*** (-27.58)	-0.0250*** (-34.61)	-0.0244*** (-27.58)
Foreigner : Europe	0.0068*** (4.65)	0.0068*** (4.02)	0.0068*** (4.66)	0.0068*** (4.03)	0.0068*** (4.67)	0.0068*** (4.02)
Foreigner : Others	-0.0127*** (-11.38)	-0.0123*** (-8.93)	-0.0127*** (-11.36)	-0.0123*** (-8.91)	-0.0127*** (-11.35)	-0.0123*** (-8.93)
Permanent	-0.0423*** (-24.23)	-0.0466*** (-22.86)	-0.0422*** (-24.17)	-0.0465*** (-22.82)	-0.0423*** (-24.17)	-0.0465*** (-22.76)
Full-time	-0.0227*** (-14.71)	-0.0197*** (-12.00)	-0.0227*** (-14.70)	-0.0197*** (-11.98)	-0.0227*** (-14.69)	-0.0197*** (-12.02)
Constant	0.3869*** (5.70)	0.3962*** (6.24)	0.3882*** (5.71)	0.3947*** (6.22)	0.3882*** (5.72)	0.3935*** (6.13)
Age fixed effects	YES	YES	YES	YES	YES	YES
Job position fixed effects	YES	YES	YES	YES	YES	YES
Workplace location fixed effects	YES	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Observations	7831673	5651266	7543131	5451096	7543131	5452235
Adjusted R-squared	0.853	0.854	0.852	0.853	0.852	0.853

Table 2.9: Wage model : CFO sub-samples

This table reports the OLS regression results of a dynamic Mincer model estimating the relations between unionization, income smoothing and pay rises.

Dependent variable : Next year natural logarithm of the hourly wage. Dynamic model : lagged dependent variable is added in the right-hand to capture current wage level. In (1) and (2) SMOOTH is respectively SMOOTH\_VB\_TA and SMOOTH\_CB\_TA (total accruals smoothing variables). In (3) and (4) SMOOTH is respectively SMOOTH\_VB\_DA and SMOOTH\_CB\_DA (discretionary accruals smoothing variables). In (5) and (6) SMOOTH is respectively SMOOTH\_VB\_DEXP and SMOOTH\_CB\_DEXP (discretionary expenses smoothing variables). Panel A (B) shows the results of the base specification run on the sub-sample of low (high) CFO volatility firms. [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A : Low CFO volatility firms</b>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>
SMOOTH	-0.0005 (-0.36)	-0.0078 (-1.58)	-0.0006 (-0.34)	-0.0074 (-1.48)	0.0007 (0.28)	0.0078 (1.51)
UNION	<b>0.0029</b> <b>(1.34)</b>	<b>-0.0019</b> <b>(-0.35)</b>	<b>0.0032</b> <b>(1.39)</b>	<b>-0.0008</b> <b>(-0.16)</b>	<b>0.0032</b> <b>(1.28)</b>	<b>0.0084</b> <b>(1.57)</b>
UNION * SMOOTH	<b>-0.0013</b> <b>(-0.76)</b>	<b>0.0062</b> <b>(1.13)</b>	<b>-0.0013</b> <b>(-0.56)</b>	<b>0.0051</b> <b>(0.90)</b>	<b>-0.0011</b> <b>(-0.34)</b>	<b>-0.0066</b> <b>(-1.17)</b>
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	4916226	3643552	4633846	3447819	4633846	3448958
Adjusted R-squared	0.860	0.860	0.859	0.860	0.859	0.860
<b>Panel B : High CFO volatility firms</b>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>
SMOOTH	0.0037 (0.99)	0.0074 (1.15)	0.0043 (1.09)	0.0057 (0.72)	-0.0020 (-0.67)	0.0049 (0.95)
UNION	<b>0.0117***</b> <b>(2.90)</b>	<b>0.0237***</b> <b>(2.83)</b>	<b>0.0136***</b> <b>(3.24)</b>	<b>0.0329***</b> <b>(3.35)</b>	<b>0.0048</b> <b>(1.57)</b>	<b>0.0098</b> <b>(1.44)</b>
UNION * SMOOTH	<b>-0.0120**</b> <b>(-2.45)</b>	<b>-0.0201**</b> <b>(-2.42)</b>	<b>-0.0148***</b> <b>(-2.85)</b>	<b>-0.0301***</b> <b>(-3.03)</b>	<b>-0.0017</b> <b>(-0.41)</b>	<b>-0.0061</b> <b>(-0.90)</b>
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	2915447	2007714	2909285	2003277	2909285	2003277
Adjusted R-squared	0.846	0.847	0.845	0.847	0.845	0.846

Table 2.10: Wage model : number of labor unions

This table reports the OLS regression results of a dynamic Mincer model estimating the relations between the number of labor unions in the firm, income smoothing and pay rises.

Dependent variable : Next year natural logarithm of the hourly wage. Dynamic model : lagged dependent variable is added in the right-hand to capture current wage level. In (1) and (2) SMOOTH is respectively SMOOTH\_VB\_TA and SMOOTH\_CB\_TA (total accruals smoothing variables). In (3) and (4) SMOOTH is respectively SMOOTH\_VB\_DA and SMOOTH\_CB\_DA (discretionary accruals smoothing variables). In (5) and (6) SMOOTH is respectively SMOOTH\_VB\_DEXP and SMOOTH\_CB\_DEXP (discretionary expenses smoothing variables). In all panels, SMOOTH is splitted into 2 quantiles (LOW and HIGH) in order to allow the interaction with the number of labor unions which is an ordinal variable. While Panel A shows the results on the full-sample, Panel B (C) shows the results on the sub-sample of low (high) CFO volatility firms. [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A : Full sample specification</b>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>
SMOOTH : HI	0.0010 (0.69)	-0.0014 (-0.84)	0.0011 (0.76)	-0.0010 (-0.63)	0.0001 (0.07)	0.0013 (0.82)
<b>NB UNIONS</b>	<b>0.0031***</b> (5.34)	<b>0.0027***</b> (4.13)	<b>0.0031***</b> (5.30)	<b>0.0027***</b> (4.04)	<b>0.0027***</b> (4.61)	<b>0.0027***</b> (4.08)
<b>NB UNIONS * SMOOTH : HI</b>	<b>-0.0014**</b> (-2.49)	<b>-0.0009</b> (-1.44)	<b>-0.0014**</b> (-2.54)	<b>-0.0009</b> (-1.48)	<b>-0.0007</b> (-1.17)	<b>-0.0009</b> (-1.44)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	7831673	5651266	7543131	5451096	7543131	5452235
Adjusted R-squared	0.853	0.854	0.852	0.853	0.852	0.853
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel B : Low CFO volatility specification</b>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>
SMOOTH : HI	0.0016 (0.83)	-0.0021 (-0.93)	0.0010 (0.53)	-0.0018 (-0.79)	0.0030 (1.55)	0.0050** (2.28)
<b>NB UNIONS</b>	<b>0.0029***</b> (3.97)	<b>0.0024***</b> (3.02)	<b>0.0027***</b> (3.62)	<b>0.0024***</b> (2.89)	<b>0.0030***</b> (3.74)	<b>0.0033***</b> (3.81)
<b>NB UNIONS : SMOOTH : HI</b>	<b>-0.0013*</b> (-1.72)	<b>0.0002</b> (0.21)	<b>-0.0008</b> (-1.00)	<b>-0.0000</b> (-0.02)	<b>-0.0010</b> (-1.44)	<b>-0.0016**</b> (-2.08)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	4916226	3643552	4633846	3447819	4633846	3448958
Adjusted R-squared	0.860	0.860	0.859	0.860	0.859	0.860
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel C : High CFO volatility specification</b>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>	<i>LN HW</i> <sub>T+1</sub>
SMOOTH : HI	0.0010 (0.47)	-0.0013 (-0.53)	0.0018 (0.86)	-0.0005 (-0.21)	-0.0018 (-0.89)	-0.0025 (-1.05)
<b>NB UNIONS</b>	<b>0.0040***</b> (4.24)	<b>0.0036***</b> (3.21)	<b>0.0043***</b> (4.56)	<b>0.0036***</b> (3.24)	<b>0.0028***</b> (3.24)	<b>0.0021**</b> (2.12)
<b>NB UNIONS * SMOOTH : HI</b>	<b>-0.0025***</b> (-2.85)	<b>-0.0027***</b> (-2.71)	<b>-0.0030***</b> (-3.40)	<b>-0.0027***</b> (-2.73)	<b>-0.0007</b> (-0.71)	<b>-0.0001</b> (-0.13)
Controls & fixed effects	YES	YES	YES	YES	YES	YES
Observations	2915447	2007714	2909285	2003277	2909285	2003277
Adjusted R-squared	0.846	0.847	0.845	0.847	0.845	0.847

## 2.6 Appendice

### Variables definitions

Variable	Level	Description	Source
UNION	Firm	Union indicator variable that is equal to one if at least one labor union exists and zero otherwise	ACEMO-DSE (Ministry of Labor)
NB UNIONS	Firm	Union ordinal variable that is equal to the exact number of different labor unions	ACEMO-DSE (Ministry of Labor)
Smoothing variables		All computed on a 4 years window using last year, current year and the next two years data	
$SMOOTH_{VB\_TA}$	Firm	$SMOOTH_{VB\_TA}_t = \frac{\sigma(CFO)_{t-1,t+2} - \sigma(NI)_{t-1,t+2}}{\sigma(CFO)_{t-1,t+2}}$ , where NI is net income and CFO is cash-flow from operations, both scaled by average total assets. From a modification of a variable proposed in [Leuz et al., 2003]	FARE (tax administration)
$SMOOTH_{CB\_TA}$	Firm	$SMOOTH_{CB\_TA}_t = -\rho(\Delta CFO, \Delta TA)_{t-1,t+2}$ , the negative of the pearson correlation coefficient between total accruals (TA) and the cash-flows from operations (CFO), both scaled by average total assets, following [Dou et al., 2013]	FARE (tax administration)
$SMOOTH_{VB\_DA}$	Firm	$SMOOTH_{VB\_DA}_t = \frac{\sigma(PDI_{DA})_{t-1,t+2} - \sigma(NI)_{t-1,t+2}}{\sigma(PDI_{DA})_{t-1,t+2}}$ , where NI is net income scaled by average total assets and $PDI_{DA} = NI - DA$ . DA is computed as the residuals of the following model from [Kothari et al., 2005]: $\frac{TA_t}{ATA} = \beta_0 + \beta_1 \frac{1}{ATA} + \beta_2 \frac{\Delta Sales_t}{ATA} + \beta_3 \frac{PPE_t}{ATA} + \beta_4 ROA_t + \epsilon$ , where TA is total accruals, $\Delta Sales$ is change in total sales, PPE is gross property, plant and equipment, ROA is return on assets computed as net income over average total assets, and ATA is average total assets	FARE (tax administration)
$SMOOTH_{CB\_DA}$	Firm	$SMOOTH_{CB\_DA}_t = -\rho(\Delta PDI_{DA}, \Delta DA)_{t-1,t+2}$ , the negative of the pearson correlation coefficient between the change in pre-discretionary income ( $PDI_{DA}$ ) and the change in discretionary accruals (DA), following [Tucker and Zarowin, 2006]. $PDI_{DA} = NI - DA$ , where NI is net income scaled by average total assets and DA is computed as the residuals of the following model from [Kothari et al., 2005]: $\frac{TA_t}{ATA} = \beta_0 + \beta_1 \frac{1}{ATA} + \beta_2 \frac{\Delta Sales_t}{ATA} + \beta_3 \frac{PPE_t}{ATA} + \beta_4 ROA_t + \epsilon$ , where TA is total accruals, $\Delta Sales$ is change in total sales, PPE is gross property, plant and equipment, ROA is return on assets computed as net income over average total assets, and ATA is average total assets	FARE (tax administration)
$SMOOTH_{VB\_DE}$	Firm	$SMOOTH_{VB\_DE}_t = \frac{\sigma(PDI_{DEXP})_{t-1,t+2} - \sigma(NI)_{t-1,t+2}}{\sigma(PDI_{DEXP})_{t-1,t+2}}$ , where NI is net income scaled by average total assets and $PDI_{DEXP} = NI + DEXP$ . DEXP is computed as the residuals of the following model from [Roychowdhury, 2003]: $\frac{SG\&A_t}{ATA} = \beta_0 + \beta_1 \frac{1}{ATA} + \beta_2 \frac{Sales_{t-1}}{ATA} + \epsilon$ , where SG&A is selling, general and administrative expenses, $Sales_{t-1}$ is last year total sales, and ATA is average total assets	FARE (tax administration)
$SMOOTH_{CB\_DE}$	Firm	$SMOOTH_{CB\_DE}_t = \rho(\Delta PDI_{DEXP}, \Delta DEXP)_{t-1,t+2}$ , the pearson correlation coefficient between the change in pre-discretionary income ( $PDI_{DEXP}$ ) and the change in discretionary expenses (DEXP), following [Roychowdhury, 2003]. $PDI_{DEXP} = NI + DEXP$ , where NI is net income scaled by average total assets and DEXP is computed as the residuals of the following model from [Roychowdhury, 2003]: $\frac{SG\&A_t}{ATA} = \beta_0 + \beta_1 \frac{1}{ATA} + \beta_2 \frac{Sales_{t-1}}{ATA} + \epsilon$ , where SG&A is selling, general and administrative expenses, $Sales_{t-1}$ is last year total sales, and ATA is average total assets	FARE (tax administration)
SMOOTH	Firm	Any of the previous $SMOOTH_{\#\#\#}$ variable, corresponding smoothing variable is specified in the Table header	FARE (tax administration)
SMOOTH : HI	Firm	Half of the firms experiencing the highest SMOOTH	FARE (tax administration)
CFO VOL	Firm	Standard deviation of cash-flow from operations computed on a 4 years window (last year, current year and the next two years)	FARE (tax administration)
CFO VOL : Q#	Firm	Quartiles splitting firms depending on the value of CFO VOL	FARE (tax administration)
CFO VOL : HI	Firm	Half of the firms experiencing the highest CFO VOL	FARE (tax administration)
SIZE	Firm	The natural logarithm of the full-time equivalent employees	FARE (tax administration)
ROA	Firm	Return on assets ratio, calculated as net income divided by average total assets	FARE (tax administration)
ROA (# ; #)	Firm	Ordinal variable splitting firms in 10 groups depending on the value of their average ROA over a 4 years window (last year, current year and the next two years). Base group has a positive and close to zero average ROA (between 0 and 0.01)	FARE (tax administration)
GROWTH	Firm	Sales growth, defined as change in sales divided by lagged sales	FARE (tax administration)

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Continuation ...

Variable	Level	Description	Source
LEVERAGE	Firm	Leverage ratio, calculated as the sum of long-term and short-term debts divided by average total assets	FARE (tax administration)
NOA	Firm	Net operating assets (NOA) scaled by lagged sales, with NOA measured as shareholders' equity plus long-term and short-term debts less cash and marketable securities	FARE (tax administration)
CAPEX	Firm	Capital expenditures scaled by average total assets	FARE (tax administration)
ISSUE	Firm	Debt or equity issuance indicator variable, one if the amount of net bond and equity issuance is above zero, and zero otherwise	FARE (tax administration)
DIVIDEND	Firm	Indicator variable, one if a firm pays dividends, zero otherwise	FARE (tax administration)
FIRM AGE	Firm	Firm age, measured as the natural logarithm of the difference between the current year and the year when the firm first appeared in the tax administration database	FARE (tax administration)
$LNHW_{T+1}$	Employee	Natural logarithm of the next year hourly wage	DADS (Ministry of Finance)
$LNHW_T$	Employee	Natural logarithm of the current year hourly wage	DADS (Ministry of Finance)
Gender	Employee	Indicator variable, one if the employee is a female, and zero otherwise	DADS (Ministry of Finance)
Foreigner : Europe	Employee	Indicator variable, one if the employee is a foreigner coming from a European country, and zero otherwise	DADS (Ministry of Finance)
Foreigner : Others	Employee	Indicator variable, one if the employee is a foreigner coming from a non European country, and zero otherwise	DADS (Ministry of Finance)
Permanent	Employee	Indicator variable, one if the employee holds a permanent job contract, and zero otherwise	DADS (Ministry of Finance)
Full-time	Employee	Indicator variable, one if the employee holds a full-time job contract, and zero otherwise	DADS (Ministry of Finance)
Workforce : HI HC	Firm	Percentage of the workforce holding the job positions : Intellectual Professions and Executives (high human capital)	DADS (Ministry of Finance)
Workforce : MED HC	Firm	Percentage of the workforce holding the job positions : Intermediary Professions (medium human capital)	DADS (Ministry of Finance)
Workforce : Full-time	Firm	Percentage of the workforce holding a full-time job contract	DADS (Ministry of Finance)
Workforce : Permanent	Firm	Percentage of the workforce holding a permanent job contract	DADS (Ministry of Finance)
Workforce : French	Firm	Percentage of the workforce having a French nationality	DADS (Ministry of Finance)
Workforce : Age	Firm	Average age of the workforce	DADS (Ministry of Finance)
Workforce : Gender	Firm	Feminization rate of the workforce	DADS (Ministry of Finance)

## Chapter 3

# Gender Pay Gap, Labor unions and the Performance of Firms

Joint work with Professor Edith Ginglinger

*Abstract :*

Using detailed employee-employer administrative data, we analyze the impact of gender pay gap on the performance of firms and find that it depends on the presence of labor unions. When the firm is not unionized, the gender pay gap decreases profitability. In contrast, when unions are present, the gender gap has no effect on profitability in male dominated firms and increases profitability in female dominated firms. Our evidence suggests that, when there is no union, giving priority to cohesion and pay equality is value enhancing. In highly feminized firms, unions provide the option for non-pecuniary benefits to employees, female opting for a better work-life balance and male for higher salaries. Our findings indicate that, in these firms, the gender pay gap may reflect the divergent interests of female and male employees, and can positively affect firm value.



Despite numerous reports and analysis, gender pay gap remains large in most developed countries: it equals 13.8% on average for OCDE countries in 2016 (OCDE, 2017) and 16% at the European level (21% in Germany and 15.4% in France) using hourly pay (Eurostat, 2017). Women are also less represented in top executive positions [Matsa and Miller, 2011]. An increasing number of countries have introduced provisions relating to transparency of gender pay gap (Denmark from 2006, UK from 2017, France from 2019) and encouraging pay equality. The European Union (EU) has released its strategic engagement for gender equality into all EU policies. Further, gender gap is one of the items that socially responsible investors scrutinize. Some shareholders feel concerned by gender pay inequality and use shareholder resolutions to request the disclosure of gender pay gap. For example, in 2019, Arjuna, an investment firm which specializes in sustainable and ethical investing, asked nearly a dozen tech, retail and banking companies to disclose median pay at their annual meetings with shareholders.<sup>1</sup> In January 2019, CitiGroup responded to such a shareholder proposal by raising the pay for women in the United States, the United Kingdom and Germany.<sup>2</sup> However, despite the growing interest of stakeholders in this issue, evidence on the real effects of gender pay inequality on firms' outcomes is limited.

In this paper, we use detailed French employee-employer administrative data to examine the consequences of the gender pay gap on the performance of firms, in unionized and non-union firms. We find that the gender pay gap decreases profitability in non-union firms, whereas in the presence of unions, the gender gap increases profitability in female dominated firms and has no effect on profitability in male dominated firms.

The gender pay gap is the result of multiple factors. It is affected by job classifications, female occupations and skills, qualifications, individually negotiated pay, access to training, family responsibilities leading to shorter hours, part-time working and fewer women in top

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<sup>1</sup>Gender is the focus of nearly a third of some 400 shareholder resolutions dealing with social, environmental and governance issues proposed for the 2019 annual meetings, according to Michael Passoff, head of Proxy Impact. <https://www.reuters.com/article/us-usa-women-pay/be-honest-about-u-s-gender-pay-gap-investors-tell-firms-idUSKCN1QN231>

<sup>2</sup><https://www.reuters.com/article/us-citigroup-pay/citi-to-raise-pay-for-women-and-minorities-in-u-s-uk-germany-idUSKBN1F428H>

positions.<sup>3</sup> Other factors, which may be less measurable, are also at work. Women may be more risk averse [Croson and Gneezy, 2009], less inclined to competition [Niederle and Vesterlund, 2007], less overconfident [Huang and Kisgen, 2013] and have a lower propensity to negotiate over salaries and promotions [Babcock and Laschever, 2003].

We use French administrative data covering the non-financial private sector from 2009 to 2016. We first compute a measure of gender pay gap at the employee level, using a one-to-one matching on observable factors such as firm, location, age, job occupation, type of job contract, year and industry. We only keep firms for which at least ten yearly pairs are successfully matched. The resulting sample is composed of 19,784 firm-year observations spanning the period 2009-2016. From these man-woman pairs, we find a median (average) gender pay gap of 9.35% (10.38%), varying from 15.42% (18.28%) for high skilled white-collars to 4.61% (5.85%) for low and unskilled white-collars. We then compute a measure of gender pay gap at the firm-level by averaging all man-woman pairs gender gaps in each firm. The gender pay gap in our firm-level sample is on average 10.7%, from 20% for high skilled white-collars to 5.17% for low and unskilled white-collars. The gender pay gap is decreasing over the sample period, from 12% in 2009, to 9% in 2015.

We first investigate the determinants of the firm-level gender pay gap and then explore the impact of gender pay gap on firm operating performance. We confront two different perspectives. On the one hand, if employees have a preference for non-competitive environments and greater cohesion and cooperation in the firm, a policy emphasizing pay equality – and no gender gap – may lead to enhanced performance, due to higher satisfaction of employees<sup>4</sup>. On the other hand, if male are more productive than female and want to be rewarded with higher salaries, gender pay gap may have a positive effect on performance. First, controlling for year and industry fixed effects as well as firms' characteristics, we find that the gender pay gap decreases the performance of non-union firms. The gender pay gap is costly for these firms, as it increases men wages, leaving women wages unchanged, and resulting in a higher total payroll. Gender pay gap decreases

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<sup>3</sup>For a review of the importance of these factors in explaining the gender pay gap, see [Blau and Kahn, 2017]

<sup>4</sup>Several papers focus on the importance of human capital, employees being a key asset, and on employee satisfaction to improve the performance of firms [Zingales, 2000, Edmans, 2011]

profitability in non-union firms because labor productivity does not increase enough to compensate higher labor costs. It may be that in these firms, due to lower protection and reduced wage transparency, pay equality would be the employees' preferred option, and also the more efficient one for the company. Second, we explore the impact of labor unions on the relation between gender gap and the performance of firms. Even if unions advocate in favor of gender pay equality<sup>5</sup>, during negotiations, they often focus on measures to address overall pay inequality, rather than gender pay inequality only<sup>6</sup>. One of the reasons may be the lack of women at the top of unions and at the negotiating tables. Unions also advocate that campaigns to raise the minimum wage for all workers help to increase women's pay. However, they do not decrease gender pay gap. When considering labor unions, our previous results change. On average, we are not able to highlight any significant effect of gender gap on the performance of unionized firms, which is also the result we obtain for male dominated firms. In contrast, we find that, in female dominated firms, gender gap decreases operating performance in non-union firms but increases it in unionized firms. Feminized firms are characterized by lower average salaries and any potential lower labor productivity does not compensate the lower salaries, leading to an average higher performance. In feminized firms, high gender gaps involve a strong increase in wages while the positive effect on labor productivity is limited to unionized firms, explaining the positive impact on profitability in unionized firms and the negative one in non-union firms. We find evidence that in female dominated firms, labor unions' bargaining does not focus on wages but may rather focus on flexible working arrangements and policies on work-life balance, improving paid parental leave, enhancing access to child care, all measures that female may particularly appreciate.<sup>7</sup> Therefore, female may favor flexibility at the expense of a higher gender gap benefiting to male. What could be the mechanism explaining the positive impact on profitability? [Clark, 1997] find that women report higher levels of

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<sup>5</sup>See for example the survey by the European Trade Union Confederation, "Bargaining for equality", 2014

<sup>6</sup>Several studies find that overall wage compression in a country helps explain smaller gender pay gap, see for example [Blau and Kahn, 1992]. For a recent overview of the relationship between unionization and wage inequality, see [Card et al., 2018]

<sup>7</sup>On average, women spend 26 hours a week on care activities, compared to 9 hours spent by men (Eurofound, 2013).

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job satisfaction than men do, despite the fact that they are on average worse-off in the labor market in terms of pay. This gender satisfaction differential mainly exists in female dominated workplaces. Several studies find that flexibility and better work-life balance policies improve the well-being of employees and are associated with significant higher productivity [Bloom and Van Reenen, 2006, Bender et al., 2005]. Our results suggest that gender pay gap has to be taken together with work-life balance policies improving employee satisfaction and can lead to an overall value enhancing equilibrium.

Our results are both statistically and economically significant. The patterns that we observe in our main results remain after various robustness checks involving changes in empirical specifications, sampling restrictions, variable construction methods, instrumental variables methods, and covariates balancing pre-processing. First, we use two alternative computation methods for the gender gap, and our results remain the same. Second, we may have a reverse causality issue, as firms with better performance may be more inclined to reduce the gender gap, which could explain our results for firms without union (but not those with unions). Likewise, unionization could be affected by reverse causality because poor, or high, performing firms may more likely become unionized. We use a 2SLS approach to instrument gender gap and a Woolridge 3-steps procedure to instrument unionization, and our results are confirmed. Third, as non-union firms may differ in characteristics compared to unionized firms, we use entropy balancing pre-processing method to construct a reweighted sample where non-union and unionized firms share similar characteristics and our findings are confirmed.

Our paper contributes to several strands of research. First, our study is related to the literature on gender pay gap. A large review of the main results on factors explaining gender pay gap can be found in [Blau and Kahn, 2017]. Our findings confirm the decrease of the gender pay gap over time and the main conventional variables identified to explain it: occupation, size of the firm, high tech activities, workforce age and education.<sup>8</sup> The literature in this field mainly describes and explains gender pay gap but the evidence on its impact on performance is rare. Examining the effect of a new legislation on gender

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<sup>8</sup>There is also a large strand of literature on gender pay gap in leadership positions, see for example [Geiler and Renneboog, 2015]

pay gap transparency in Denmark, [Bennedsen et al., 2019] find that the law reduces gender pay gap, primarily by slowing the wage growth for male employees. In addition, the wage transparency mandate causes a reduction in the productivity of the firm and in the overall wage bill, leaving the profitability of the firm unchanged. We find that the impact of gender pay gap on operational performance can be positive or negative depending on whether the company is female or male dominated, and whether there is a union or not. Second, our paper is related to the literature examining the impact of employee satisfaction [Edmans, 2011, Guiso et al., 2015, Huang et al., 2015] and corporate social responsibility practices [Ferrell et al., 2016, Deng et al., 2013] on the value and the performance of firms. Our results that gender gap improves productivity and performance in female dominated firms when a union is present suggest that women may place higher value and satisfaction on work-life balance policies rather than higher wages, which leads to enhanced performance. These preferences may also be related to the studies underlining that parenthood is one of the main driver of the lack of women in top executive positions [Keloharju et al., 2019] and of the large gender pay gap in leadership positions [Bertrand et al., 2010, Geiler and Renneboog, 2015, Angelov et al., 2016]. Third, we contribute to the literature examining the impact of pay inequality on the performance of firms, as overall wage compression and gender gap are often related [Blau and Kahn, 1992]. Using a matched employer-employee data set for Sweden, [Heyman, 2005] finds a positive and significant effect of wage dispersion on profitability. Using a proprietary data set of UK firms, [Mueller et al., 2017] show that firms with higher pay inequality have higher valuations, better operating performance and higher equity returns. Their results are consistent with pay inequality reflecting managerial talent or incentive provisions. In contrast, [Rouen, 2019] finds a negative relation between unexplained pay disparity, a proxy for pay unfairness, and the future performance of firms. These papers do not examine the impact of the presence of unions on their results. Our evidence on gender pay gap highlights that unions have an impact on the relation between pay inequality and performance, one possible explanation being that unions provide a kind of fairness certification that makes inequality more acceptable to employees. Furthermore, more specifically focusing on gender pay inequalities, [Kulich et al., 2011] argue that the gender gap in leadership positions is driven by the fact that men have much stronger upward

remuneration potential whereas women are offered contracts that are less performance sensitive. [Grund, 2015] finds that gender pay gaps are much more pronounced for bonus payments than they are for fixed salaries, which is also in line with [Flory et al., 2015] results that women are reluctant to performance-based compensation. Our findings that gender pay gap increases performance in female dominated firms with at least one union can also be interpreted as female accepting incentive wages for male, as long as they are granted work-life balance benefits for themselves. The rest of this paper is structured as follows. In section 2, we present the institutional context of unions as well as gender pay gap in France. In section 3, we detail our hypotheses. In section 4, we present our gender gap measures and dataset. We analyze our empirical results in section 5, and section 6 concludes.

## 3.1 The French institutional setting

### 3.1.1 Unions in France

Institutions shaping labor relations in France differ from the US or the UK. In the US and the UK, one union, and only one, negotiates for a bargaining unit which is a group of employees with a community of interest (similar occupations, geographic location, duties, payment structure, review/rating system). To be certified, the labor union must receive a majority vote from the employees of the bargaining unit. The firm's union coverage depends on the size of all bargaining units compared to the size of the firm. In France, every two to four years, elections take place in each workplace of the firm to determine which labor unions will be certified for the next two to four years. Absence of initiatives from the employer to organize the elections falls under criminal law. The bargaining unit is the whole workplace workforce and multiple labor unions can be certified for the same bargaining unit. To be certified, a labor union needs to gather 10% of the votes cast at the election. In addition to this workplace-level certification process, a firm-level one also occurs. For the firm-level certification, votes from all the firm's workplaces are aggregated and labor unions that have gathered 10% of the aggregated votes are certified at the firm-level. Labor unions certified at the firm-level represent all the firm's employees

regardless of the votes cast at a specific workplace. All employees, from a workplace or a firm, are represented by the certified labor unions and benefit from collective bargainings without the need to pay a fee to the labor unions which are financed by public subsidies and mandatory employers' financial support. The firm's union coverage depends on both workplace and firm-level certifications. The low certification threshold of 10% and the firm-level certification process are institutions which makes it not unusual to get a firm's union coverage of 100%.

### **3.1.2 Gender gap in France**

In France, gender pay gap drew the attention of the legislator as soon as 1972 with the "loi du 22 décembre relative à l'égalité de rémunération entre les hommes et les femmes" that established the principle of equal pay between men and women for equal work. Later, in 1976, the EU Directive 76/207/EEC, on the implementation of the principle of equal treatment for men and women as regards access to employment, vocational training and promotion, and working conditions, followed in 1983 by its transposition into French law with the "loi Roudy du 13 juillet 1983", aimed to remove all discriminatory provisions against women in the whole professional field. In 2001, the "loi Génisson du 9 mai 2001" extended collective bargaining to gender equality negotiations. More recently, the "loi Ameline du 23 mars 2006" aimed to eliminate pay gaps in the private sector before December 31, 2010 and to facilitate the link between professional and personal life, as well as the access to vocational training and apprenticeships. Facing the difficulty of eliminating pay gaps in the private sector, the "loi du 9 novembre 2010" on pension reform removed the deadline of 31 December 2010 for the elimination of pay gaps between women and men. However, it added to the existing negotiating obligations the obligation to establish, by January 2012, a collective agreement or an action plan to ensure professional equality between women and men. It also introduced a financial penalty for companies, with more than 50 employees, which fail to publish this action plan. Since 2011, the "loi Copé-Zimmerman du 27 janvier 2011", on the balanced representation of women and men on boards of directors and supervisors and on professional equality, has forced all public firms and all large private firms (500 employees and total sales or total assets of

50 millions euros) to include at least 40% of each gender in their boards as of January 1, 2017. The "loi du 4 août 2014" for real equality between women and men extended the field of gender equality in collective bargainings and extended the "loi Copé-Zimmerman" to smaller private firms (250 employees). Last, the "loi du 5 septembre 2018 pour la liberté de choisir son avenir professionnel" imposed that all firms with more than 50 employees have to disclose a measure of gender pay gap within the firm. The decree "Décret 2019-15 du 8 janvier 2019" indicated the way to compute the measure and the threshold under which the firm shall be liable to financial penalties of 1% of total payroll.

## 3.2 Hypotheses development

### 3.2.1 Why might gender pay gap have an impact on the performance of firms?

H1. Incentive effects: The performance of firms increases with gender pay gap. According to [Lazear and Rosen, 1981] tournament theory, if wages are based on relative productivity, high productivity employees should be rewarded with higher wages. As a consequence, the equilibrium effort will increase, leading to a positive relation between pay dispersion and productivity. Tournament models also predict that pay gap increases when moving up the hierarchy [Rosen, 1986]. If male are systematically more productive than female, these models would predict that male are granted higher salaries than females and that gender gap would result in higher profitability.<sup>9</sup>

H2. Cohesiveness: The performance of firms decreases with gender pay gap. According to [Akerlof and Yellen, 1990], individual effort may be reduced if employees regard their wage as unfair. A similar argument can be found in [Levine, 1991]. [Lazear, 1989] argues that homogeneous wage treatment may allow preserving worker unity, maintaining good

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<sup>9</sup>However, the drawback of these predictions is that they rely on average characteristics of male and female as a group, and they may lead to statistical discrimination, firms paying women less because of their lower average expected productivity, rather than upon their own merits. Such a wage policy is illegal under anti-discrimination laws and regulation, even if a rich literature has provided convincing evidence that discrimination exists (see for example [Bertrand and Duflo, 2016]).



morale and creating a cooperative work environment. On the other hand, high quality workers may decide to leave the firm. Pay equality may improve the performance of firms if the morale of the average work force is sufficiently improved to offset the worsening of high quality workers morale. Furthermore, wage compression may reduce uncooperative behavior, especially in presence of a large fraction of competitive individuals in a firm.

There are also papers showing that employee satisfaction improves the performance of firms [Hansen and Wernerfelt, 1989, Edmans, 2011]. If pay equality and its corollary, the absence of gender pay gap, increase the average employee satisfaction, it should lead to enhanced performance.

H3. Competition: The relation between performance and gender pay gap depends on the intensity of competition within the firm. A large number of papers provide evidence that women shy away from competitive environments and that men compete too much given their abilities [Niederle and Vesterlund, 2007, Reuben et al., 2015]. In this context, [Lazear, 1989] results would predict that pay equality, which implies a reduced gender pay gap, could be efficient especially in firms with a large proportion of male employees, whereas in female dominated firms, more pay inequality, potentially leading to a higher gender pay gap, could be useful. Conducting a large-scale field experiment, [Flory et al., 2015] find that when replying to a job offer, the applicant pool shifts to being more male dominated when the proposed compensation is more heavily relying on individual performance. This result is especially salient for male-type jobs. Male dominated firms willing to attract women employees should therefore reduce pay inequality, and female dominated firms should increase pay inequality to attract men. As a consequence, in male dominated firms, performance may decrease with gender gap, whereas in female dominated firms, performance may increase with gender gap.

### **3.2.2 The impact of unions on the relation between gender pay gap and performance**

There is large evidence that unions lower wage inequality, even controlling for individual worker effects [Lewis, 1983, Freeman, 1984, Freeman, 1991, Card et al., 2004]. However,

unions have a much smaller equalizing effect on female pay inequality than male pay inequality [Card, 2001, Gosling and Lemieux, 2001].

H4. Transparency: The presence of unions increases transparency on wages/outputs, offsetting the negative impact of gender pay gap on performance. Unions may provide greater transparency of wages and salary scales. Using an experiment with Indian manufacturing workers, [Breza et al., 2018] find that workers appear to accept homogeneous wages as fair even when there are productivity differences, but similarly have no issue with clearly justified heterogeneous wages. In contrast, they may resent what they perceive as arbitrary behavior from an employer. Therefore, disparate wages are acceptable only in presence of transparency in outputs. In our context, unions may provide a kind of certification of fairness relative to employee wages/outputs, allowing gender pay gap to reflect female/male distinct productivity, without negative effect on performance.

H5. Family friendly benefits versus wages: By bringing the voice of women's requests for non pecuniary benefits to the bargaining table, union may increase employees' satisfaction and the performance of the firm (especially in highly feminized firms). One reason for unions having a much smaller equalizing effect on female pay inequality could be linked to the fact that unions bargain on policies focused on work-life balance rather than exclusively on wages. Unions act as agents of collective voice and convey the employees' collective preference to the employers. They may reallocate the total compensation package toward greater employee benefits and lower wages. If family-friendly benefits are more valued by female than male, unions may favor these benefits in highly feminized firms. For example, using British data, [Budd and Mumford, 2004] find that unionized workplaces are more likely to have parental leave, child care and job sharing policies than similar workplaces with no union. Such a policy could imply lower wages for female, who favor family-friendly benefits, and higher wages for male, leading to a larger gender gap in unionized highly feminized firms. Gender gap could reflect different flexibility/salary trade-offs made by female and male, leading to higher employee satisfaction and increased profitability.

## 3.3 Data and summary statistics

### 3.3.1 Data

We draw the sample of firm-year observations from the ACEMO-DSE<sup>10</sup> labor relations surveys from 2009 to 2015. The ACEMO-DSE survey covers all French firms with more than 500 employees and a representative sample for smaller firms, from 10 to 500 employees. Any lack of response or intentional error from firms gives rise to an administrative fine. The survey contains information at the firm-level on labor representation such as unions' presence.

To investigate our research hypotheses, we create two different datasets, a firm-level one to analyze the impact of gender pay gap on total payroll, labor productivity and operating performance, and an employee-level one to analyze the impact of gender pay gap on male and female wages at the employee-level. We will refer to these datasets respectively as the *Firm-level dataset* and the *Employee-level dataset*.

**Firm-level dataset** First, we discard any observations from the ACEMO-DSE data that are related to banks, insurance companies, agricultural sector, economic interest groups, associations and foundations, in order to focus our analyses on the non-financial business economy. We then match the remaining firm-year observations to data from the French tax administration (DGFIP).<sup>11</sup> French firms have a mandatory obligation to provide, each year, accounting data to the tax administration. We then trim the data removing firms that have ceased or suspended their activity during the current year. Second, we merge the dataset with the GECIR<sup>12</sup> also produced by the French tax administration (DGFIP) to identify firms engaged in R&D. In France, R&D expenditures entitle firms to a tax credit of 30%, giving strong incentives to report these expenses to the tax authority.

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<sup>10</sup>Labor force activity and employment conditions : social dialogue in firms, DARES, Ministry of Labor.

<sup>11</sup>Direction Générale des Finances Publiques, French Ministry of Budget, Public Accounts and Civil Administration.

<sup>12</sup>Database on the "Crédit Impôt Recherche", DGFIP

Third, we merge the dataset with the LIFI<sup>13</sup> database, which identifies business groups, in order to determine if a firm belong to a business group. Fourth, we match this merged dataset to an aggregated dataset at the firm-level from the annual declaration of social data (DADS-Postes). The DADS is a social database produced by the INSEE.<sup>14</sup> The DADS is a declaratory formality that all companies with employees must fill. In the DADS, employers supply various information about each employee: age, gender, job occupation, type of job contract, number of hours under job contract with the firm, and total salaries and benefits received. Thus, we can determine at the firm-level the number of full-time equivalent employees, the feminization rate of the workforce and the workforce mean age and socio-professional composition. Last, we merge the dataset with gender pay gap data. Gender gap data is constructed with a hand-written algorithm presented in last paragraph of this section. The resulting sample contains X firm-year observations representative of the French non-financial private sector.

**Employee-level dataset** For the investigation of male and female wages at the employee-level, we merge the employee-level data from the DADS-Postes to the *Firm-level dataset*. We obtain a database containing information on all the employment contracts of each firm-year observation of the *Firm-level dataset*. To avoid large firm bias and to render the computations possible, we randomly pick 100 employment contracts coming from 100 unique workers for each firm-year observation. The *Employee-level dataset* contains X employee-level observations. For each observation, in addition to the firm-level data from the *Firm-level dataset*, the following information at the employee-level is available : wage, number of hours under job contract, age, gender, origin (French, European or from outside the European Union), location where the workplace operates (322 employment zones defined as geographical areas within which most of the workers reside and work, and in which firms' workplaces can find the vast majority of their needed workforce), job position (29 socio-professional categories, using the 2 digits PCS-ESE job classification of the INSEE), the employment conditions (full-time or part-time) and type of job contract

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<sup>13</sup>Enquête sur les liaisons financières entre sociétés, INSEE.

<sup>14</sup>Institut national de la statistique et des études économiques, French Ministry for the Economy and Finance.

(unfixed-term or fixed-term).

**Gender gap variables** The main gender gap variable used throughout the paper is computed with a hand-written one-to-one matching algorithm. First, the algorithm collects information on all the employment contracts of each firm-year observation of the *Firm-level dataset*. Second, it splits the data into two samples, one for men and one for women. Third, it randomly sorts both samples. Fourth it selects the first woman of the female sample and looks into the male sample for the best match. The best match is a match that fulfills two conditions : it is a possible match and there are no better possible matches in the male sample. A possible match is a man that works in the same firm, in the same year, in the same employment zone, in the same industry, in the same job position, with the same employment conditions (full-time or part-time), the same type of job contract (unfixed-term or fixed-term) and with a maximum age difference of two years. From all possible matches, the best one is the one which minimizes age difference. If there are still multiple men observations that fulfill all these criteria, the algorithm selects the first of these observations to be matched. Fifth, the selected man observation is matched to the woman observation and is removed from the male sample so it can not be matched to any other remaining woman observation. If no man is a possible match, the woman observation is deleted from the female sample. Sixth the algorithm repeats the above procedure for all observations in the female sample. Seventh, after all matches are done, the algorithm computes the firm-level gender gap by averaging all gender gaps from all man/woman pairs that belong to the firm. The algorithm also computes a firm-level gender gap for each group of job positions (high skilled white-collars, medium skilled white-collars, low and unskilled white-collars, skilled blue-collars and unskilled blue-collars) by averaging gender gaps from all pairs belonging to a group of job positions. For each gender gap variable, the algorithm imposes at least 10 pairs to compute a gender gap variable. Eighth, the algorithm stores the above gender gap variables and starts again from step three to repeat the procedure 199 times to ensure that sample sorting does not bias computation. Ninth, for each firm-year observation, the gender gap variables are averaged over the 200 replications.

We also use two alternate gender gap measures as robustness checks. Both measures involve

grouping, for each firm and each year, employees by job positions and age categories. Group gender gaps are computed for each group. For both measures, group gender gaps are computed using all the employment contracts of each firm-year observation of the *Firm-level dataset*. For a given year, firm gender gap is the weighted average of these group gender gaps. The weights are the number of full-time equivalent employees in each group. The first measure, the *gender gap (group)* variable, is computed with the following rules : groups are a combinaison of 22 job positions (2-digit PCS-ESE) and 11 "5-years" age categories (16-20 / 21-25 / ... / 61-65 / 66-70). Group gender gaps are computed only if at least one man and one woman are in the group and firm gender gap is computed only if there are at least 10 full-time equivalent male employees and 10 full-time equivalent female employees in the groups from which group gender gaps are computed. The second measure, the *gender gap (law)* variable, is computed following the rules fixed by the decree : employees that were not under a job contract with the firm during at least 6 months for a given year are discarded and groups are a combinaison of 4 job positions (high skilled white-collars, medium skilled white-collars, low and unskilled white-collars and blue-collars) and 4 age categories (less than 30 / 30-39 / 40-49 / 50 and more). Group gender gaps are computed only if at least 3 men and 3 women are in the group and group gender gaps are set to zero if the absolute value of the group gender gap is below 5%. Last, *gender gap (law)* is computed only if there are at least 40% of the firm's employees in the groups from which group gender gaps are computed. As a consequence, *gender gap (law)* suffers from downward bias because groups with small gender gaps are considered to have no gap, which ultimately decreases the firm-level average gender gap.

### 3.3.2 Summary statistics

Table 3.1 shows descriptive statistics of variables used in both the *Firm-level dataset* and the *Employee-level dataset*. The average gender pay gap is 10.7% both with the main gender gap measure and with the *gender gap (group)* measure. The *gender gap (law)* measure has a lower average at 5.17%, which is explained by the methodology imposed by the decree. The gender gap varies accross job positions from 20% for highly skilled white-collars to 5.17% for low-skilled and unskilled white-collars. The average return on assets, computed

as the EBIT over total assets, is 0.0476 and the average labor productivity, computed as the natural logarithm of the ratio of value-added over full-time equivalent employees, is 11. The average firm size is approximately 410 full-time equivalent employees. The average unionization is 76.8% and the average workforce age is 40 years old. The average feminization rate is 40.1% and 10.6% of the firms have a female employee earning the firm's highest wage which will be our proxy for firms with a female CEO. 87.1% of the firms are affiliated with a business group which highlights the importance of this organizational structure in France. 39.49% of these firms are considered dominant because they employ the majority of the workers of the whole business group. Firms involved in R&D represent 34.6% of the firm-year observations. The average workforce composition is 19.5% of high skilled white-collars, 20.4% of skilled white-collars, 18.7% of skilled blue-collars, 15.9% of unskilled blue-collars and 25.5% of low skilled and unskilled white-collars, found by difference. The descriptive statistics of the instrumental variables show that the average support for extremist political parties is 34.1% and that 6.06% of the workforce is composed of female high-skilled white-collars, representing 31.24% of the high-skilled white-collar average. The average leverage, computed as total debts over total assets, is 15.5%. The average (gross) hourly wage is 17.3 euros. Finally, the employee-level average age, job position, employment condition and job contract type are comparable to their firm average.

Figures (a) to (e) show descriptive statistics of the evolution and distribution of the gender pay gap. Figure (a) shows that the average gender pay gap is decreasing from 12% in 2009 to 9% in 2015. Figure (b) suggests that the gender pay gap is higher in unionized firms. Figure (c) indicates that, splitting the sample in half according to the feminization rate, the gender pay gap is approximately one third lower in highly feminized firms. Summary statistics in Table 3.1 have shown that the gender gap depends on the employees' job positions. Figure (d) gives evidence that the reduction in gender gap from 2009 to 2015 is concentrated on skilled white-collar employees. Finally, figure (e) suggests that the CEO gender is a key determinant of the gender pay gap. Firms with a female CEO have half the gender pay gap of firms with a male CEO. These univariate associations need to be confirmed with the following multivariate analyses.

## 3.4 Empirical results

### 3.4.1 Is gender gap random ?

To our knowledge, no paper in the literature has ever provided firm-level regressions of the gender gap to investigate variables that may be associated with it. Table 3.2 shows coefficient estimates of firm-level regressions of the gender gap on various variables, such as unionization, feminization rate, female CEO, firm size, capital intensity, business group affiliation, R&D expenditures, workforce composition (mean age and percentages of employees in each job position) and industry and year fixed effects. In all specifications, unionization decreases the gender gap significantly, both statistically and economically. Unionization decreases the gender gap by 0.0079 which represents a 7.38%<sup>15</sup> decrease in gender gap. Although we found that higher feminization rate was associated with lower gender gap in the summary statistics, there is evidence that a higher feminization rate actually leads to a higher gender gap after controlling for firms' characteristics. However, column 4 and 5 indicate that this finding is circumscribed to firms with a female CEO. The coefficient estimate on female CEO is, along with the estimates related to workforce composition, the most important variable that affects the level of gender gap. Having a female CEO is associated with a 21.68%<sup>16</sup> decrease in gender gap. Column 4 shows that when a female is CEO, the gender gap decreases by a sharp 39.72% when the feminization rate is close to zero but decreases only by 6.26% when the feminization rate is close to 100%. This result may suggest that female top managers believe that gender gap is less unfair in feminized firms where women can more easily enjoy family-friendly benefits. Column 5 confirms all previous findings. Other covariates have the expected sign: estimates on firm size is negative and close to statistical significance, capital intensity and group affiliation have no effect on gender gap, R&D firms have higher gender gap and the workforce composition has a strong impact on gender gap. Higher workforce age and job positions are associated with higher gender gap, confirming the summary statistics.

<sup>15</sup>Compared to the average firm, gender gap in unionized firms is  $[\frac{0.0079}{0.107} = 7.38\%]$

<sup>16</sup>Compared to the average firm, gender gap in female CEO firms is  $[\frac{0.0232}{0.107} = 21.68\%]$



### 3.4.2 What is really gender gap ?

Since gender gap is a wage differential between similar men and women, employee-level wage analyses allow to investigate how gender gap shapes men and women wage level.

**Identification strategy** The employee-level wage model is a Mincer model, controlling for employee and firm characteristics. Compared to firm-level wage models, employee-level wage models better control for workforce composition, allow to control for workplace location, account for multi-industry firms by identifying the industry in which each employee operates and allow to investigate male and female wages. To investigate wage at the employee-level, we follow the literature and include firm-level and employee-level covariates. Firm-level covariates are firm size proxied by the natural logarithm of the number of full-time equivalent employees, capital intensity constructed as the natural logarithm of the ratio of non-current tangible assets value over full-time equivalent employees, R&D activities captured by a binary variable which is equal to one for firms with R&D expenditures, business group affiliation with two binary variables for dominant firms employing the majority of the group workforce and for non dominant firms, various covariates to capture workforce composition such as workforce mean age, feminization rate and percentages of employees in specific job positions (high skilled white-collars, medium skilled white-collars, skilled blue-collars and unskilled blue-collars), firm leverage proxied by total debts over total assets, labor productivity captured for each industry-year as quintiles of natural logarithm of the ratio of value-added over full-time equivalent employees, percentages of part-time and fixed-term job contracts, and two covariates to capture the percentage of non-French employees (from the European Union or not). Employee-level covariates are gender, age, age squared, origin for non-French employees (from the European Union or not), 2 binary variables for the type of job contract (fixed-term and/or part-time), 29 job position fixed effects (2 digit PCS-ESE job classification) and 322 employment zone fixed effects to capture local job market conditions. The INSEE determines the contours of the employment zones in France. Employment zones are defined as geographical areas within which most of the workers reside and work, and in which firms' workplaces can find the vast majority of their needed workforce. Finally, industry fixed-effects at the

NACE/NAF/CITI division-level industry classification (88 industries) and year fixed-effects are also included. Industry fixed effects are determined at the employee-level to take into account multi-industry firms.

The model is :

$$Wage_i = \alpha + \rho \cdot Union_i + \gamma \cdot Gender\ gap_i + \varphi \cdot Feminization_i + \beta \cdot X_i + \epsilon \quad (3.1)$$

Wage is the natural logarithm of hourly wage,  $i$  indexes employees,  $Union$  indicates unionization and  $X$  is a vector of observable covariates described above.

**Results** Table 3.3 reports the coefficient estimates of the employee-level wage model. In column 1, on the full sample, the average gender gap estimate is 10.04% which is very close to the 10.7% of our firm-level matching algorithm. Log-transformation tends to lower high differentials which could be a possible explanation for the slightly lower estimate. Unionization increases wages by 0.62% on average and while gender gap is associated with higher wages, feminization rate is associated with lower wages even after controlling for employee gender. These results suggest that, on average, labor unions succeed at increasing wages, gender gap increases wages which means that the augmentation of men wages is not fully compensated by a decrease in women wages, and feminized firms experience lower wages. To investigate gender gap, we also run unconditional quantile regressions (UQR) on the specification in column 1, using the recentered influence function, following [Firpo et al., 2009]. Figure (e) reports the coefficient estimates of the female variable for each quantile of the unconditional wage distribution, from 5% to 95% with 5% bins. Estimates refer to gender gap. The slope gives strong evidence that the gender gap increases with wage level, confirming the intuition given by the summary statistics about gender gap increasing in job positions that offer higher wages. Column 2 and 3 show that gender gap is increasing men wages but is not decreasing nor increasing female wages. Women in high gender gap firms are being paid as much as in other firms. Union wage premium is positive only for men but is mitigated by gender gap. The higher the gender gap, the less labor unions are able to increase wages. The effect of unionization and gender gap on wages are substitutes for each other. Columns 4 and 5 explain previous results from column 2 and 3 concerning union wage premium being apparently focused on men.

Union wage premium is actually similar for men and women but union wage premium is decreasing with feminization rate and since 73% of the women are working in feminized firms whereas only 32.81% of the men are working in such firms, not controlling for the interaction between unionization and feminization rate leads to biased estimates. Results from columns 4 and 5 suggest that labor unions in feminized firms may prefer non-financial benefits rather than pay rises. It supports the hypothesis of labor unions trying to match employees aspirations. If women favor family-friendly benefits rather than higher wages, then it is rational for labor unions in feminized firms to focus on these non-financial benefits. Concerning gender gap, previous results are confirmed. Last, columns 6 to 9 show coefficient estimates respectively for men and women in both masculinized and feminized firms to take into account the effect of feminization rate on the union wage premium. Previous findings are all confirmed. Labor unions increase wages for men and women in masculinized firms, but not in feminized firms. Gender gap increases men wages leaving women wages unchanged, both in masculinized and feminized firms. Last, gender gap mitigates union wage premium in firms where labor unions do increase wages, i.e. in masculinized firms. All in all, results indicate that gender gap is not a zero sum game, the total payroll increases significantly. Men higher wages are not even partially compensated by lower women wages. To cover these additional salary costs, firms must believe that gender gap will increase labor productivity enough to, at least, compensate these costs. Finally, gender gap acts as a substitute for union wage premium, which suggests that gender gap may be used to lower labor unions bargaining position. As a result, gender gap policies are less costly in masculinized unionized firms.

### **3.4.3 How does gender gap affect the performance of firms ?**

#### **3.4.3.1 Identification strategy**

To investigate the effect of gender gap on performance, proxied by earnings before interests and taxes (EBIT) over total assets, we will investigate performance but also firm-level wages and labor productivity. Since EBIT is roughly equal to value-added less total payroll, our investigation will allow to identify by which channel gender gap could affect

performance. The ACEMO-DSE labor relations survey is highly unbalanced because only firms with more than 500 full-time equivalent employees are in the sample every year. Since nearly all these large firms are unionized in all years of the panel, firm fixed-effects can not be used to investigate the interaction between gender pay gap and unionization on performance because there is no intra-firm intertemporal variation on the unionization variable. As a result, only pooled models can be used. We limit omitted variables bias by controlling for variables which have a causal effect on both unionization and gender gap and which affect performance. Following the literature, we include covariates for firm size proxied by the natural logarithm of the number of full-time equivalent employees, capital intensity constructed as the natural logarithm of the ratio of non-current tangible assets value over full-time equivalent employees, R&D activities captured by a binary variable which is equal to one for firms with R&D expenditures, business group affiliation with two binary variables for dominant firms employing the majority of the group workforce and for non dominant firms, and various covariates to capture workforce composition such as workforce mean age, feminization rate, and the percentages of employees in specific job positions (high skilled white-collars, medium skilled white-collars, skilled blue-collars and unskilled blue-collars). Industry fixed-effects at the NACE/NAF/CITI division-level industry classification (88 industries) and year fixed-effects are also included. For the firm-level wage analysis, further controls are required such as firm leverage proxied by total debts over total assets, labor productivity captured for each industry-year as quintiles of natural logarithm of the ratio of value-added over full-time equivalent employees, percentage of part-time and fixed-term job contracts, and two covariates to capture the percentage of non-French employees (from the European Union or not). Concerns about potential reverse causality issues are addressed in section 3.4.4.1.

The models are :

$$Wages_i = \alpha + \rho.Union_i + \gamma.Gender\ gap_i + \varphi.Feminization_i + \beta.X_i + \zeta.Y_i + \epsilon \quad (3.2)$$

$$Productivity_i = \alpha + \rho.Union_i + \gamma.Gender\ gap_i + \varphi.Feminization_i + \beta.X_i + \epsilon \quad (3.3)$$

$$ROA_i = \alpha + \rho.Union_i + \gamma.Gender\ gap_i + \varphi.Feminization_i + \beta.X_i + \epsilon \quad (3.4)$$

Wages are the natural logarithm of the ratio of total salaries and benefits over full-time equivalent employees, Productivity is the natural logarithm of the ratio of value-added

over full-time equivalent employees, and ROA is earnings before interest and taxes (EBIT) scaled by total assets.  $i$  indexes the firms,  $Union$  indicates unionization and  $X$  and  $Y$  are vectors of observable covariates described above. First, the wage model is derived from Mincer wage models but computed at the firm-level instead of the employee-level. Second, the productivity model is derived from a Cobb-Douglas function augmented with human capital variables. Last, the ROA model is widely used in corporate finance literature.

### 3.4.3.2 Main results

Table 3.4 reports the main results. Column 1 and 2 report the wage analysis, column 3 and 4 the labor productivity analysis, and columns 5 to 6 the performance analysis. First, the wage analysis indicates that gender gap increases wages significantly and that union wage premium is positive but mitigated by gender gap. These results at the firm-level confirm the findings of the employee-level wage analysis in 3.4.2. Second, the labor productivity analysis suggests that gender gap increases labor productivity significantly, promoting the incentives hypothesis (H1). Last, in the performance analysis, coefficient estimate on gender gap in column 5 is close to zero and non significant, suggesting that gender gap has no effect on performance. We can deduce from the wages and labor productivity analyses in columns 1 and 3 that gender gap increases both wages and labor productivity in the same magnitude, leaving performance unchanged. Although on average gender gap has no effect on performance, the results are sharply different when taking into account unionization status. In column 6, estimate on gender gap is negative and highly significant whereas estimate on the interaction between unionization and gender gap is positive and highly significant. It comes from the wages and labor productivity analyses in columns 2 and 4 that in non-union firms gender gap increases wages too much compared to the increase in labor productivity. In unionized firms, the gender gap mitigation effect on the union wage premium allows wages rise to be on par with labor productivity rise.

### 3.4.3.3 Additional results

We saw in [Table 3.3](#) that both unionization and the interaction between unionization and gender gap were affected by firms' feminization rate. [Table 3.5](#) reports additional results taking into account feminization rate interactions. Columns 1 to 3 report the wage analysis, columns 4 to 6 the labor productivity analysis, and columns 7 to 9 the performance analysis. First, column 1 indicates that if feminization rate decreases wages, it does even more when the firm is unionized. These findings also confirm the results of the employee-level wage analysis in [3.4.2](#). Female are paid less so more women means lower total payroll and feminized unionized firms pay less there employees, men and women, than their masculinized counterparts because of the disappearance of the union wage premium. Columns 2 and 3 further show that union wage premium is concentrated in masculinized firms, that gender gap increases wages in both masculinized and feminized firms, and that gender gap mitigates the union wage premium. Second, column 4 suggests that feminization rate has no effect on labor productivity in non-union firms whereas feminization rate in unionized firms has a strong negative effect on labor productivity. This finding is consistent with the family-benefits hypothesis ([H5](#)). In feminized firms, labor unions may prefer to focus on private-life issues rather than wages, which would explain that they are associated with lower productivity and lower wages compared to their counterparts in masculinized firms. The average effect of gender gap on labor productivity is positive. Gender gap increases labor productivity in all types of firm but feminized non-union firms. Possible explanations are that, in feminized non-union firms, women see gender gap as unfair and work less intensively in return, neutralizing the increase in effort of men who benefit from gender gap, consistent with the cohesiveness hypothesis ([H2](#)). Conversely, in feminized unionized firms, gender gap increases labor productivity because women do not perceive it as unfair, labor unions grant trust in the fairness of the wages policies and compensate women with large family-benefits, as suggested in the transparency hypothesis ([H4](#)) and the family-benefits hypothesis ([H5](#)). Last, on performance, feminization rate, in non-union firms, increases performance because it decreases wages without decreasing labor productivity. In unionized firms, the positive effect of feminization rate is highly mitigated, which is explained by the drop in labor productivity that is higher than the

decrease in wages. Gender gap still has no impact on performance, but the negative effect of gender gap in non-union firms, shown in 3.4.3.2, is mostly concentrated in feminized firms. In non-union firms, gender gap increases wages too much compared to the rise in labor productivity, this issue being stronger in feminized firms. Moreover, in column 9, a T-test on the sum of the gender gap and unionization interaction term estimates shows that gender gap increases performance in feminized unionized firms, with a 5% significance level, suggesting that feminized unionized firms could benefit from high gender gap policies to mitigate the adverse effect of unionization in these firms, promoting the competition hypothesis (H3).

### 3.4.4 Robustness checks

#### 3.4.4.1 Instrumental variables analysis

The association between performance, gender gap and unionization is also concerned about possible reverse causality issues. If employees in lower (higher) performing firms are more willing to unionize, to protect their jobs (increase their wages), then the estimates for unionization may suffer from a negative (positive) bias. Likewise, if top managers in higher performing firms are more willing to reduce the gender gap, then the estimates for gender gap may suffer from negative bias.

In France, as stated in section 3.1.1, setting a union in a firm is far less costly than in the US and the UK. From a standard cost-benefit analysis, if the cost of unionizing is far lower in France, then unionization should not take place only where benefits are high. The reverse causality issue on French data should be less problematic than on US or UK data. Although the reverse causality may be less of an issue, we address this potential issue instrumenting both unionization and gender gap. The usual instruments for unionization found in the economic and finance literature were not convincing. Feminization rate, percentage of blue-collar workers and workforce mean age seem all associated with the performance of firms, which cast serious doubts about these variables passing the exclusion restriction. Firm age did not pass the first-stage. Concerning gender gap, to our knowledge, there is no instrumental variable proposition in the literature. We propose one instrumental

variable for unionization and two instrumental variables for gender gap.

**Instrumental variables presentation** To instrument unionization, we use the support for extremist political parties (i.e. far-left and far-right parties) in the employment zone where the workplaces operate. For firms with multiple workplaces, we compute a weighted average of this support, weights being the number of full-time equivalent employees in each employment zone. Support for extremist political parties is proxied by the percentage of votes cast for extremist political parties (NPA, LO, FG, EELV, DLF and FN) at the first round of the major French political election, the Presidential election, which took place in 2012. The results are available<sup>17</sup> at the district-level (i.e. cantonal-level) and we are able to link every district to an employment zone in order to compute our instrumental variable at the employment zone-level which better suits the job market conditions.

To instrument gender gap, we use two different variables, female CEO binary variable and the percentage of women holding a high skilled white-collar position in the firm. As in the gap analysis (3.4.1), female CEO is equal to one if the employee earning the highest wage is a woman and zero otherwise. The rationale is that, in the non-financial sector, the firm's highest wage should most of the time be earned by the top manager. The percentage of women holding a high skilled white-collar position is computed, just as the percentage of high skilled white-collar, from an aggregation of the employee-level comprehensive data of firms' job contracts found in the DADS.

Instrumental variables relevance and exclusion restriction are discussed in the following paragraphs.

**First-stage** To pass the first-stage (relevance condition), instrumental variables must be (strongly) correlated with the variable they instrument. Since unionization is a binary variable, we use Woolridge 3-steps procedure to limit bias. The rationale underlying the relevance of the support for extremist political parties to instrument unionization is that employees favoring extremist political parties should be more willing to complain and

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<sup>17</sup>The results are available at <https://www.data.gouv.fr/fr/datasets/election-presidentielle-2012-resultats-572126/>



unionize to improve their conditions. The rationale underlying the relevance of female CEO and the percentage of women holding a high skilled white-collar position to instrument gender gap is respectively that female top manager may be more concerned about unfairness toward women and that, for a given percentage of high skilled white-collars in a firm, the more women holding a high skilled white-collar position there are the higher the gender gap, because gender gap is concentrated on the higher job positions. Table 3.6 reports results from both first and second stages. Columns 1 and 3 confirm that all instrumental variables pass the relevance condition. In column 1, support for extremist political parties is positively associated with unionization. The more the residents of an employment zone support extremist political parties, the more likely the firms of that employment zone will be unionized. In column 3, female CEO is negatively associated with gender gap while female high skilled white-collar rate is positively correlated with gender gap. These estimates confirm previous findings: female top managers decrease gender gap, as documented in the gap analysis (3.4.1), while the percentage of female holding a high job position increases the firm-level gender gap because gender gap is concentrated in these positions, as shown in summary statistics (3.3.2), gap analysis (3.4.1) and employee-level wage analysis (3.4.2).

**Second-stage** To pass the exclusion restriction, instrumental variables must be uncorrelated with the error term of the performance model. This condition is not testable, but we argue that, controlling for observables, employees' support for specific political parties should not be correlated with the performance of firms, that there is no reason to believe that women do better or worse than men at running a firm, and that women in high skilled white-collar position may not be more profitable to firms than similar men (other than through gender gap). Including these instrumental variables directly in the performance model leads to non significant estimates. Overidentification test (Hansen J statistic) on the instrumentation of gender gap reports a p-value of 0.3518, suggesting that both instrumental variables for gender gap are coherent with one another. Columns 2, 4 and 5 of Table 3.6 show coefficient estimates of the second-stage. Column 2 instruments unionization and confirms that unionization decreases performance significantly. Column 4 instruments gender gap and confirms that the average effect of gender gap on performance

is not statistically different from zero. Last, column 5 instruments both unionization and gender gap to investigate their interaction term. The results confirm the findings from the main results (3.4.3.2). Gender gap decreases performance in non-union firms but not in unionized firms.

#### 3.4.4.2 Covariates balancing

Parametric regressions impose a functional form leading to potential misspecification errors. Unionization can be seen as a treatment effect. When covariates between the treated and untreated groups are not balanced, misspecification error can lead to biased estimates. There is an extensive literature about covariates balancing and the techniques to achieve balance such as exact matching, coarsened exact matching, propensity score matching with or without replacement, or entropy balancing. In this paper, we use entropy balancing from [Hainmueller, 2012] because this recent method, which is getting more and more attention, allows excellent balance without the need of repeatedly looking for the best parameterization as required with propensity-score matching. Entropy balancing weights the observations so that the reweighted treatment and control groups satisfy the same moments of the covariate distributions. In this paper we balance covariate distributions between non-union and unionized firms for the first three moments. [Balance tests](#) show that the reweighted sample is well balanced. The pseudo- $R^2$  is close to zero which means that the covariates are not determining unionization anymore. The mean and median bias are respectively 0.7 and 0, with a bias on the gender gap variable of 0. To further allow comparisons with propensity-score matching techniques, we compute Rubin's  $B$ <sup>18</sup> and Rubin's  $R$ <sup>19</sup> which are respectively 5.7 and 1.82. [Table 3.7](#) reports the results on the reweighted sample. Both columns confirm previous results. Although, gender gap does not decrease performance on average, gender gap significantly decreases performance in non-union firms.

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<sup>18</sup>Rubin's  $B$  is the absolute standardized difference of the means of the propensity score index in the treated and non-treated group.

<sup>19</sup>Rubin's  $R$  is the ratio of treated to non-treated variances of the propensity score index.

### 3.4.4.3 Alternate gender gap measures

To alleviate concerns that our results may be driven by a specific way of computing firm-level gender gap, we confirm our main results using two alternative gender gap measures presented in 3.3.1. The high correlations between our three gender gap variables and the similar values reported in the summary statistics (3.3.2) suggest that the three variables are capturing a common phenomenon. Table 3.8 reports the estimates of the main specifications using all available gender gap measures. Column 1 and 4 are the main results, shown in 3.4.3.2, using our main gender gap measure, while columns 2 and 5 report results using the *gender gap (group)* measure and columns 3 and 6 report results using the *gender gap (law)* measure. All gender gap measures give similar results. Gender gap detrimental effect on performance is circumscribed to non-union firms.

## 3.5 Conclusion

In this paper, we analyze the impact of gender pay gap on the performance of firms in France. We find that the gender pay gap effect depends on the presence of unions in the firm. When the firm is not unionized, the gender pay gap decreases profitability, due to higher labor costs that are not compensated by higher productivity. In contrast, when unions are present, the gender gap has no effect on profitability in male dominated firms and increases profitability in female dominated firms. We interpret our results in the following manner: the presence of a union can be a guarantee of transparent and fair pay policy. If there is no union, employees may prefer an equal pay policy, which would also be an efficient option for the firm, as its performance would increase. This result is in line with our second hypothesis that pay equality favors cohesiveness, employee satisfaction and improves firm value. When unions are present in the firm, on average, the negative effect of gender pay gap on performance disappears, in line with our fourth hypothesis that disparate wages are acceptable in presence of transparency in outputs. Disparate wages are acceptable as long as they appear to be fair, i.e. consistent with employees' productivity. We find different results in male dominated and female dominated firms. These differences are in line with our third hypothesis that competition shifts the relation

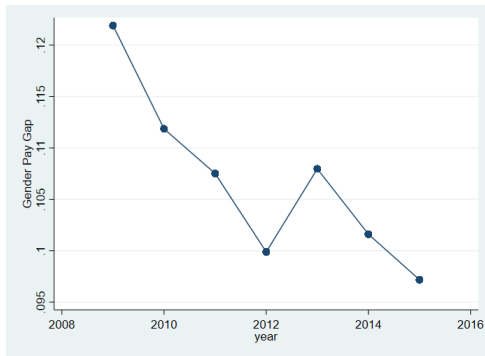
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between gender gap and performance, women shying away from competition and avoiding performance-based compensation. In male dominated firms, the gender pay gap is small and has no effect on profitability, which means that increased productivity compensates higher salaries. In contrast, in female dominated firms, we find a positive impact of gender pay gap on performance. Our findings, in line with our fifth hypothesis, suggest that in these firms, union bargaining focuses on work-life balance, which is one of the main claims of female workers, leading to higher employees' satisfaction and higher performance of the firms, despite lower salaries and higher gender gaps. Our results suggest that in female dominated firms, women collectively focus on quality of life at the expense of wages. These priorities more broadly reflect the burden of family responsibilities, which mainly fall on women. The pay gap can only be eliminated in the long term by changing cultural choices in the distribution of domestic tasks between men and women. This subject goes far beyond the compensation policies of companies and the scope of this article.

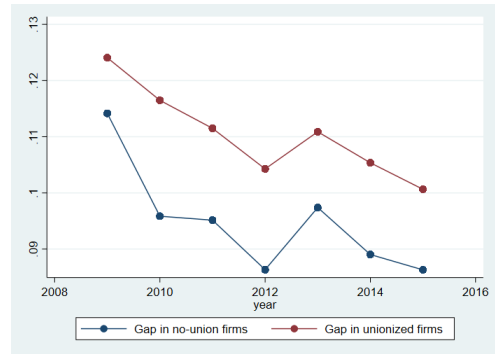
### 3.6 Figures

Figure 3.1: Evolution and distribution of the gender gap

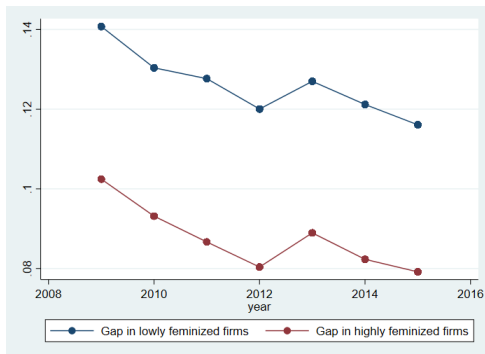
Figures (a) to (e) : Evolution and distribution of the gender gap for various sub-groups of firms and employees (descriptive statistics). In Figure (d) WC refers to white-collar and BC to blue-collar. Figure (f) : unconditional quantile regressions (UQR) results on the relation between wage and gender. Dependent variable : natural logarithm of wage over the number of hours under job contract. The gray area around the curve is 95% confidence interval, adjusted for heteroscedasticity and clustered by firm. [Appendice](#) gives definitions for all variables.



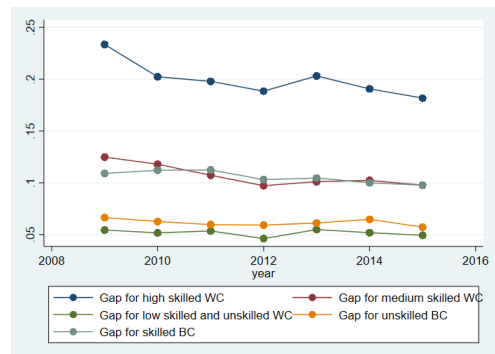
(a) Average gap



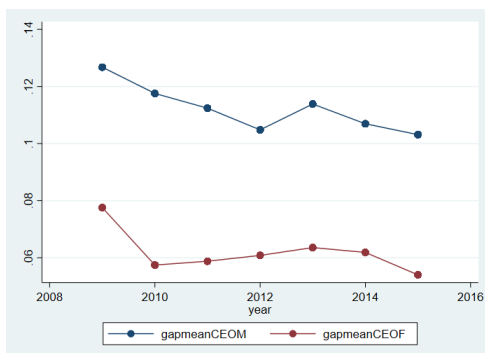
(b) Gap in non-union and unionized firms



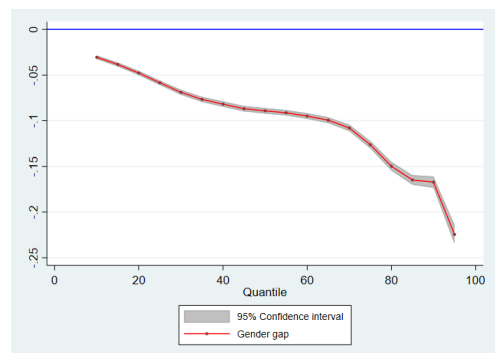
(c) Gap in masculinized and feminized firms



(d) Gap by job positions



(e) Gap by CEO gender



(f) Gap along the wage distribution

## 3.7 Tables

Table 3.1: Summary statistics

This table reports the descriptive statistics of all variables from the firm-level data set, including instrumental variables, and additional variables from the employee-level data set.

Appendice gives definitions for all variables.

	Level	mean	sd	skewness	p50	min	max	count
PANEL A : Variables from the firm-level data set								
ROA	Firm	.0476	.13	-1.16	.0499	-.642	.471	19784
Productivity	Firm	11	.613	.252	11	4.17	17.7	19645
Gender gap	Firm	.107	.1	1.07	.0923	-.0878	.473	19784
Gender gap (group)	Firm	.107	.093	1.06	.0944	-.0825	.458	19050
Gender gap (law)	Firm	.0517	.0516	.824	.0437	-.079	.236	18234
Gender gap for High skilled White-collars	Firm	.2	.16	1.05	.173	-.134	.792	8505
Gender gap (group) for High skilled White-collars	Firm	.188	.142	1.17	.162	-.107	.725	9334
Gender gap (law) for High skilled White-collars	Firm	.0947	.0949	.298	.0852	-.223	.399	12561
Gender gap for medium skilled White-collars	Firm	.108	.11	.816	.0964	-.149	.502	8596
Gender gap (group) for medium skilled White-collars	Firm	.101	.103	.781	.0909	-.158	.475	9643
Gender gap (law) for medium skilled White-collars	Firm	.0485	.072	.522	.038	-.183	.307	14148
Gender gap for low skilled and unskilled White-collars	Firm	.0517	.0974	1.24	.0339	-.175	.434	8233
Gender gap (group) for low skilled and unskilled White-collars	Firm	.053	.0981	1.12	.0355	-.188	.428	8486
Gender gap (law) for low skilled and unskilled White-collars	Firm	.0361	.0828	.957	.0133	-.214	.341	11883
Gender gap for skilled Blue-collars	Firm	.106	.096	.617	.0966	-.143	.441	5422
Gender gap (group) for skilled Blue-collars	Firm	.106	.0987	.691	.0963	-.149	.459	5663
Gender gap for unskilled Blue-collars	Firm	.0617	.0728	.926	.0509	-.128	.337	4865
Gender gap (group) for unskilled Blue-collars	Firm	.0698	.0805	1.14	.0595	-.144	.41	4945
Gender gap (law) for Blue-collars	Firm	.0533	.065	.52	.0437	-.164	.292	10514
Union	Firm	.768	.422	-1.27	1	0	1	19784
Feminization	Firm	.401	.224	.41	.371	.0149	.992	19784
female CEO	Firm	.106	.308	2.55	0	0	1	19784
Workforce age	Firm	40	4.41	-.703	40.7	22.4	59.1	19784
Firm size	Firm	6.01	1.18	.342	6.05	.916	12.4	19784
Capital intensity	Firm	9.46	1.86	-.53	9.73	-1.57	17.1	19784
Group	Firm	.871	.335	-2.21	1	0	1	19784
Group : dominant firm	Firm	.344	.475	.657	0	0	1	19784
Group : non dominant firm	Firm	.527	.499	-.108	1	0	1	19784
R&D	Firm	.346	.476	.646	0	0	1	19784
High skilled White-collars	Firm	.194	.217	1.77	.115	0	1	19784
Skilled White-collars	Firm	.204	.155	1.21	.174	0	1	19784
Skilled Blue-collars	Firm	.187	.207	1.07	.101	0	.988	19784
Unskilled Blue-collars	Firm	.159	.251	1.95	.0403	0	1	19784
PANEL B : Instrumental variables								
Support for extremist political parties	Firm	.341	.0442	.116	.345	.263	.514	19326
female CEO	Firm	.106	.308	2.55	0	0	1	19326
Female High skilled White-collar	Firm	.0606	.0841	2.63	.0279	0	.711	19326
PANEL C : Additional variables from the employee-level data set								
Hourly wage	Employee	2.85	.465	1.14	2.75	-2.48	9.05	1855885
Leverage	Firm	.155	.188	1.57	.0781	0	.93	1855885
Female	Employee	.409	.492	.37	0	0	1	1855885
Age	Employee	39.6	11.2	.0828	39	16	80	1855885
High skilled White-collars	Employee	.192	.394	1.57	0	0	1	1855885
Skilled White-collars	Employee	.198	.399	1.51	0	0	1	1855885
Unskilled and low skilled White-collars	Employee	.254	.435	1.13	0	0	1	1855885
Skilled Blue-collars	Employee	.189	.392	1.59	0	0	1	1855885
Unskilled Blue-collars	Employee	.163	.369	1.82	0	0	1	1855885
Fixed term job	Employee	.111	.315	2.47	0	0	1	1855885
Part-time job	Employee	.166	.372	1.8	0	0	1	1855885
Foreign employee : EU	Employee	.02	.14	6.85	0	0	1	1855885
Foreign employee : outside EU	Employee	.0493	.217	4.16	0	0	1	1855885

Table 3.2: Firm-level Gender gap analysis

This table reports the regression results on the relation between gender gap and various variables. Dependent variable : Gender gap. [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Dependent variable	Gender gap	Gender gap	Gender gap	Gender gap	Gender gap
Column	(1)	(2)	(3)	(4)	(5)
Union	<b>-0.0079***</b> (-3.39)	<b>-0.0115**</b> (-2.09)	<b>-0.0086***</b> (-3.47)	<b>-0.0079***</b> (-3.40)	<b>-0.0128**</b> (-2.15)
Feminization	<b>0.0137**</b> (2.00)	<b>0.0077</b> (0.74)	<b>0.0136**</b> (2.00)	<b>0.0089</b> (1.27)	<b>0.0019</b> (0.16)
female CEO	<b>-0.0232***</b> (-10.84)	<b>-0.0231***</b> (-10.81)	<b>-0.0269***</b> (-7.48)	<b>-0.0425***</b> (-7.61)	<b>-0.0562***</b> (-4.73)
Union * Feminization		<b>0.0077</b> (0.78)			<b>0.0084</b> (0.75)
Union * female CEO			<b>0.0055</b> (1.27)		<b>0.0166</b> (1.24)
female CEO * Feminization				<b>0.0358***</b> (3.80)	<b>0.0507**</b> (2.53)
Union * female CEO * Feminization					<b>-0.0157</b> (-0.70)
Firm size	-0.0013 (-1.59)	-0.0013 (-1.60)	-0.0013 (-1.60)	-0.0013 (-1.64)	-0.0014* (-1.70)
Capital intensity	-0.0003 (-0.49)	-0.0003 (-0.48)	-0.0003 (-0.48)	-0.0003 (-0.45)	-0.0003 (-0.43)
Group : dominant firm	0.0031 (1.23)	0.0031 (1.22)	0.0031 (1.23)	0.0030 (1.20)	0.0030 (1.19)
Group : non dominant firm	0.0005 (0.18)	0.0004 (0.17)	0.0004 (0.18)	0.0003 (0.13)	0.0003 (0.12)
R&D	0.0048** (2.07)	0.0048** (2.09)	0.0048** (2.08)	0.0048** (2.10)	0.0049** (2.13)
Workforce age	0.0031*** (11.51)	0.0031*** (11.53)	0.0031*** (11.52)	0.0031*** (11.60)	0.0031*** (11.62)
High skilled White-collars	0.1381*** (15.35)	0.1377*** (15.33)	0.1378*** (15.34)	0.1389*** (15.45)	0.1383*** (15.42)
Skilled White-collars	0.0619*** (7.53)	0.0618*** (7.52)	0.0619*** (7.52)	0.0619*** (7.52)	0.0618*** (7.50)
Skilled Blue-collars	0.0374*** (4.52)	0.0373*** (4.51)	0.0373*** (4.51)	0.0376*** (4.55)	0.0375*** (4.53)
Unskilled Blue-collars	-0.0125* (-1.68)	-0.0129* (-1.73)	-0.0125* (-1.69)	-0.0117 (-1.58)	-0.0121 (-1.62)
Constant	<b>-0.1247***</b> (-7.54)	<b>-0.1216***</b> (-7.10)	<b>-0.1240***</b> (-7.49)	<b>-0.1254***</b> (-7.59)	<b>-0.1209***</b> (-7.00)
Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Observations	19784	19784	19784	19784	19784
Adjusted R-squared	0.257	0.257	0.257	0.257	0.257

Table 3.3: Employee-level wage analysis

This table reports the regression results on the relation between wages and gender gap and unionization, at the employee-level. Dependent variable : HWAGE (natural logarithm of wage over the number of hours under job contract). Samples : MALE (male employees), FEMALE (female employees), \*-MF (in masculinized firms), \*-FF (in feminized firms). Masculinized and feminized firms indicators are obtained by splitting the distribution of firm-year observations from the *Firm-level dataset* in half depending on the feminization rate. [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Sample	FULL	MALE	FEMALE	MALE	FEMALE	MALE-MF	FEMALE-MF	MALE-FF	FEMALE-FF
Dependent variable	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE	HWAGE
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Female	<b>-0.1004***</b> (-93.18)								
Union	<b>0.0062**</b> (1.98)	<b>0.0157***</b> (3.42)	<b>0.0050</b> (1.36)	<b>0.0348***</b> (4.57)	<b>0.0468***</b> (6.21)	<b>0.0267***</b> (3.42)	<b>0.0295***</b> (3.77)	<b>-0.0062</b> (-1.22)	<b>-0.0015</b> (-0.36)
Gender gap	<b>0.1311***</b> (8.92)	<b>0.2890***</b> (10.24)	<b>-0.0208</b> (-0.91)	<b>0.2282***</b> (13.35)	<b>-0.0183</b> (-1.25)	<b>0.2792***</b> (6.57)	<b>0.0311</b> (0.74)	<b>0.3390***</b> (9.66)	<b>-0.0148</b> (-0.54)
Union * Gender gap		<b>-0.0830***</b> (-2.67)	<b>0.0041</b> (0.15)			<b>-0.1492***</b> (-3.26)	<b>-0.1276***</b> (-2.81)	<b>0.0924**</b> (2.21)	<b>0.0357</b> (1.08)
Feminization	<b>-0.0427***</b> (-4.18)	<b>-0.0263**</b> (-2.23)	<b>-0.0586***</b> (-5.58)	<b>0.0327**</b> (1.99)	<b>-0.0029</b> (-0.20)	<b>-0.0604**</b> (-2.07)	<b>-0.1528***</b> (-5.23)	<b>-0.0414**</b> (-2.03)	<b>-0.0709***</b> (-4.36)
Union * Feminization				<b>-0.0753***</b> (-4.99)	<b>-0.0733***</b> (-5.64)				
Firm size	0.0124*** (8.81)	0.0121*** (7.48)	0.0127*** (9.07)	0.0125*** (7.72)	0.0126*** (9.09)	0.0124*** (5.58)	0.0108*** (4.54)	0.0132*** (6.45)	0.0133*** (7.93)
Capital intensity	0.0114*** (8.84)	0.0131*** (9.21)	0.0079*** (6.00)	0.0131*** (9.23)	0.0079*** (6.08)	0.0157*** (8.79)	0.0153*** (8.71)	0.0084*** (4.32)	0.0052*** (3.29)
Productivity Q2	0.0214*** (7.30)	0.0209*** (6.20)	0.0227*** (7.77)	0.0201*** (5.92)	0.0222*** (7.63)	0.0173*** (3.95)	0.0150*** (3.22)	0.0291*** (6.78)	0.0257*** (7.51)
Productivity Q3	0.0484*** (14.71)	0.0498*** (13.19)	0.0458*** (13.65)	0.0487*** (12.86)	0.0449*** (13.45)	0.0478*** (9.79)	0.0420*** (8.70)	0.0463*** (8.95)	0.0449*** (10.99)
Productivity Q4	0.0817*** (22.26)	0.0869*** (20.85)	0.0730*** (19.08)	0.0855*** (20.42)	0.0722*** (18.94)	0.0890*** (16.48)	0.0781*** (14.70)	0.0695*** (12.34)	0.0671*** (14.29)
Productivity Q5	0.1388*** (30.06)	0.1487*** (27.88)	0.1236*** (26.85)	0.1476*** (27.60)	0.1228*** (26.75)	0.1510*** (21.76)	0.1304*** (19.61)	0.1283*** (19.19)	0.1149*** (20.48)
Group : dominant firm	<b>-0.0138***</b> (-4.23)	<b>-0.0160***</b> (-4.09)	<b>-0.0110***</b> (-3.45)	<b>-0.0156***</b> (-3.97)	<b>-0.0110***</b> (-3.45)	<b>-0.0194***</b> (-3.39)	<b>-0.0176***</b> (-3.02)	<b>-0.0101**</b> (-2.29)	<b>-0.0088**</b> (-2.40)
Group : non dominant firm	0.0156*** (4.54)	0.0158*** (3.89)	0.0142*** (4.19)	0.0163*** (4.00)	0.0143*** (4.23)	0.0135** (2.33)	0.0083 (1.41)	0.0170*** (3.54)	0.0153*** (3.86)
R&D	0.0080** (2.54)	0.0061* (1.76)	0.0110*** (3.15)	0.0056 (1.62)	0.0106*** (3.00)	0.0035 (0.85)	0.0017 (0.41)	0.0070 (1.33)	0.0132*** (2.76)
Leverage	<b>-0.0286***</b> (-3.99)	<b>-0.0320***</b> (-3.70)	<b>-0.0224***</b> (-3.36)	<b>-0.0330***</b> (-3.82)	<b>-0.0231***</b> (-3.46)	<b>-0.0201</b> (-1.64)	<b>-0.0279**</b> (-2.33)	<b>-0.0358***</b> (-3.80)	<b>-0.0165**</b> (-2.18)
Constant	<b>2.4978***</b> (15.68)	<b>2.3803***</b> (13.91)	<b>2.2518***</b> (27.58)	<b>2.3559***</b> (13.73)	<b>2.2186***</b> (27.44)	<b>2.1398***</b> (12.24)	<b>1.9526***</b> (15.29)	<b>2.4491***</b> (24.69)	<b>2.2253***</b> (29.41)
Workforce composition	YES	YES	YES	YES	YES	YES	YES	YES	YES
Employee characteristics	YES	YES	YES	YES	YES	YES	YES	YES	YES
Employment zone FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1855885	1096930	758955	1096930	758955	737003	204988	359927	553967
Adjusted R-squared	0.671	0.662	0.661	0.662	0.661	0.637	0.603	0.704	0.668



Table 3.4: Main Results

This table reports the regression results on the relation between various financial variables, such as total payroll, labor productivity or the return on assets, and gender gap and unionization.

Dependent variable : Wages (salaries and benefits), Productivity (natural logarithm of the ratio of value-added over full-time equivalent employees) and ROA (EBIT over total assets). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Dependent variable	Wages	Wages	Productivity	Productivity	ROA	ROA
Column	(1)	(2)	(3)	(4)	(5)	(6)
Union	<b>0.0369***</b> (4.64)	<b>0.0477***</b> (4.44)	<b>-0.0106</b> (-0.85)	<b>-0.0218</b> (-1.45)	<b>-0.0197***</b> (-6.07)	<b>-0.0330***</b> (-8.07)
Gender gap	<b>0.2982***</b> (12.50)	<b>0.3695***</b> (8.42)	<b>0.2018***</b> (3.99)	<b>0.1268*</b> (1.65)	<b>-0.0116</b> (-0.89)	<b>-0.1005***</b> (-5.10)
Union * Gender gap		<b>-0.1029**</b> (-2.02)		<b>0.1082</b> (1.18)		<b>0.1285***</b> (5.57)
Feminization	<b>-0.1612***</b> (-7.76)	<b>-0.1620***</b> (-7.80)	<b>-0.1034***</b> (-2.62)	<b>-0.1029***</b> (-2.61)	<b>0.0234**</b> (2.13)	<b>0.0239**</b> (2.18)
Workforce age	0.0101*** (10.56)	0.0101*** (10.58)	0.0036** (2.01)	0.0036** (2.00)	-0.0032*** (-6.96)	-0.0032*** (-7.01)
Firm size	-0.0065* (-1.88)	-0.0067* (-1.94)	-0.0205*** (-3.63)	-0.0202*** (-3.57)	-0.0045*** (-3.48)	-0.0042*** (-3.22)
Capital intensity	0.0118*** (3.80)	0.0119*** (3.81)	0.1203*** (19.77)	0.1202*** (19.75)	0.0051*** (4.86)	0.0050*** (4.76)
Group : dominant firm	-0.0178*** (-2.69)	-0.0180*** (-2.71)	0.0113 (0.86)	0.0115 (0.87)	0.0110*** (3.23)	0.0112*** (3.29)
Group : non dominant firm	0.0024 (0.33)	0.0021 (0.29)	0.0219 (1.59)	0.0222 (1.61)	0.0023 (0.61)	0.0026 (0.70)
R&D	0.0066 (1.32)	0.0070 (1.40)	0.0384*** (3.04)	0.0379*** (3.00)	0.0071** (2.26)	0.0066** (2.09)
High skilled White-collars	0.8878*** (34.30)	0.8857*** (34.16)	1.1214*** (24.58)	1.1234*** (24.60)	-0.0054 (-0.43)	-0.0030 (-0.24)
Skilled White-collars	0.2715*** (11.33)	0.2715*** (11.32)	0.3195*** (6.36)	0.3197*** (6.36)	-0.0030 (-0.20)	-0.0029 (-0.19)
Skilled Blue-collars	-0.0102 (-0.36)	-0.0106 (-0.37)	-0.1566*** (-3.03)	-0.1558*** (-3.01)	-0.0390*** (-2.77)	-0.0382*** (-2.72)
Unskilled Blue-collars	-0.1186*** (-3.21)	-0.1193*** (-3.22)	-0.3204*** (-6.18)	-0.3194*** (-6.16)	-0.0342** (-2.45)	-0.0330** (-2.37)
Constant	3.4348*** (51.58)	3.4276*** (51.69)	10.4952*** (83.38)	10.5030*** (83.54)	0.2217*** (8.55)	0.2312*** (8.93)
Additional wage model controls	YES	YES	NO	NO	NO	NO
Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	19772	19772	19645	19645	19784	19784
Adjusted R-squared	0.732	0.733	0.493	0.493	0.063	0.065

Table 3.5: Additional Results

This table reports the regression results on the relation between various financial variables, such as total payroll, labor productivity or the return on assets, and gender gap and unionization. Dependent variable : Wages (salaries and benefits), Productivity (natural logarithm of the ratio of value-added on full-time equivalent employees) and ROA (EBIT over total assets). Samples : MF (masculinized firms) and FF (feminized firms). Masculinized and feminized firms indicators are obtained by splitting the distribution of firm-year observations in half depending on the feminization rate. [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Sample	FULL	MF	FF	FULL	MF	FF	FULL	MF	FF	FULL	MF	FF	FULL	MF	FF	
Dependent variable	Wages			Productivity			Productivity			ROA			ROA			
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
Union	0.0868*** (4.19)	0.0900*** (3.54)	0.0159* (1.87)	0.0592** (2.46)	0.0395 (1.57)	-0.0602*** (-3.29)	-0.0056 (-0.84)	-0.0214*** (-3.07)	-0.0365*** (-7.31)	0.2699** (2.22)	0.0290 (0.29)	0.0290 (0.29)	0.0056 (0.84)	-0.0431 (-1.61)	-0.1170*** (-4.18)	
Feminization	-0.0796** (-2.14)	-0.1439** (-2.22)	-0.1455*** (-4.78)	0.0101 (0.22)	0.0855 (0.82)	-0.1736** (-2.52)	0.0463*** (3.28)	0.1176*** (4.35)	-0.0081 (-0.42)	0.2699** (2.22)	0.0290 (0.29)	0.0290 (0.29)	0.0463*** (3.28)	0.1176*** (4.35)	-0.0081 (-0.42)	
Union * Feminization	-0.1059*** (-3.10)	-0.1059*** (-3.10)	-0.1059*** (-3.10)	-0.1481*** (-3.27)	-0.1481*** (-3.27)	-0.1481*** (-3.27)	-0.1481*** (-3.27)	-0.1481*** (-3.27)	-0.1481*** (-3.27)	0.2699** (2.22)	0.0290 (0.29)	0.0290 (0.29)	-0.0299** (-2.26)	-0.0299** (-2.26)	-0.0299** (-2.26)	
Gender gap	0.2993*** (12.53)	0.5132*** (5.64)	0.2693*** (5.52)	0.2034*** (4.02)	0.2699** (2.22)	0.0290 (0.29)	0.0290 (0.29)	0.2699** (2.22)	0.0290 (0.29)	0.2699** (2.22)	0.0290 (0.29)	0.0290 (0.29)	-0.0113 (-0.86)	-0.0431 (-1.61)	-0.1170*** (-4.18)	
Union * Gender gap	-0.3361*** (-3.24)	-0.3361*** (-3.24)	0.0726 (1.23)	0.0726 (1.23)	-0.1308 (-0.93)	0.2781** (2.20)	0.0726 (1.23)	0.0726 (1.23)	0.0726 (1.23)	0.2781** (2.20)	0.0290 (0.29)	0.0290 (0.29)	0.0581* (1.85)	0.0581* (1.85)	0.1656*** (4.78)	
Workforce age	0.0100*** (10.33)	0.0119*** (7.82)	0.0110*** (11.02)	0.0034* (1.91)	0.0034* (1.91)	0.0089*** (4.28)	0.0034* (1.91)	0.0034* (1.91)	0.0034* (1.91)	0.0089*** (4.28)	0.0089*** (4.28)	0.0089*** (4.28)	-0.0032*** (-7.03)	-0.0032*** (-7.03)	-0.0029*** (-5.02)	
Firm size	-0.0063* (-1.84)	-0.0011 (-0.20)	-0.0109** (-2.92)	-0.0202*** (-3.58)	-0.0133 (-1.53)	-0.0234*** (-3.37)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0044*** (-3.43)	-0.0058*** (-3.19)
Capital intensity	0.0119*** (3.85)	0.0180*** (5.18)	0.0138*** (2.69)	0.1202*** (19.78)	0.1145*** (13.28)	0.1279*** (17.06)	0.0051*** (4.85)	0.0051*** (4.85)	0.0051*** (4.85)	0.1279*** (17.06)	0.0051*** (4.85)	0.0051*** (4.85)	0.0051*** (4.85)	0.0051*** (4.85)	0.0051*** (4.85)	0.0053*** (4.11)
Group : dominant firm	-0.0175*** (-2.65)	-0.0176 (-1.46)	-0.0219*** (-3.20)	0.0118 (0.89)	0.0186 (0.85)	0.0052 (0.33)	0.0111*** (3.25)	0.0111*** (3.25)	0.0111*** (3.25)	0.0052 (0.33)	0.0052 (0.33)	0.0052 (0.33)	0.0125** (2.06)	0.0125** (2.06)	0.0115*** (2.87)	
Group : non dominant firm	0.0028 (0.38)	-0.0045 (-0.33)	0.0068 (0.91)	0.0225 (1.63)	0.0452** (2.00)	0.0057 (0.33)	0.0024 (0.63)	0.0024 (0.63)	0.0024 (0.63)	0.0452** (2.00)	0.0057 (0.33)	0.0057 (0.33)	0.0080 (1.27)	0.0080 (1.27)	-0.0003 (-0.06)	
R&D	0.0061 (1.22)	0.0023 (0.39)	0.0168** (2.16)	0.0375*** (2.96)	0.0209 (1.27)	0.0658*** (3.64)	0.0069** (2.21)	0.0069** (2.21)	0.0069** (2.21)	0.0209 (1.27)	0.0658*** (3.64)	0.0658*** (3.64)	0.0069** (2.21)	0.0069** (2.21)	0.0168*** (3.44)	
High skilled White-collars	0.8937*** (35.29)	0.8201*** (18.32)	0.9237*** (30.31)	1.1285*** (24.83)	0.9155*** (11.83)	1.1659*** (19.45)	-0.0039 (-0.31)	-0.0039 (-0.31)	-0.0039 (-0.31)	0.9155*** (11.83)	1.1659*** (19.45)	1.1659*** (19.45)	-0.0039 (-0.31)	-0.0039 (-0.31)	0.0022 (0.14)	
Skilled White-collars	0.2725*** (11.41)	0.2192*** (6.12)	0.3045*** (8.86)	0.3208*** (6.39)	0.1562** (2.01)	0.3671*** (5.13)	0.0028 (0.19)	0.0028 (0.19)	0.0028 (0.19)	0.3208*** (6.39)	0.3671*** (5.13)	0.3671*** (5.13)	-0.0028 (-0.22)	-0.0028 (-0.22)	-0.0089 (-0.50)	
Skilled Blue-collars	-0.0098 (-0.35)	0.0014 (0.04)	-0.1697*** (-4.42)	-0.1554*** (-3.01)	-0.2547*** (-3.21)	-0.3201*** (-4.78)	-0.0388*** (-2.75)	-0.0388*** (-2.75)	-0.0388*** (-2.75)	-0.1697*** (-4.42)	-0.2547*** (-3.21)	-0.2547*** (-3.21)	-0.0388*** (-2.75)	-0.0388*** (-2.75)	-0.0238 (-1.17)	
Unskilled Blue-collars	-0.1138*** (-3.10)	-0.0813 (-1.41)	-0.2516*** (-5.44)	-0.3130*** (-6.04)	-0.3232*** (-3.63)	-0.4547*** (-7.16)	-0.0327** (-2.35)	-0.0327** (-2.35)	-0.0327** (-2.35)	-0.2516*** (-5.44)	-0.3232*** (-3.63)	-0.3232*** (-3.63)	-0.0327** (-2.35)	-0.0327** (-2.35)	-0.0186 (-1.09)	
Constant	3.3902*** (53.81)	3.2452*** (35.04)	3.0823*** (46.70)	10.4355*** (83.23)	10.8342*** (66.60)	9.4502*** (72.83)	0.2097*** (8.04)	0.2410*** (5.87)	0.2410*** (5.87)	10.4355*** (83.23)	10.8342*** (66.60)	10.8342*** (66.60)	0.2097*** (8.04)	0.2410*** (5.87)	0.1708*** (5.37)	
Additional wage model control variables	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Observations	19772	9889	9883	19645	9814	9831	19784	9892	9892	9814	9831	19784	9892	9892	9892	
Adjusted R-squared	0.733	0.687	0.772	0.494	0.441	0.551	0.064	0.058	0.058	0.441	0.551	0.064	0.058	0.058	0.079	

Table 3.6: Instrumental variables analysis

This table reports the 2SLS regression results on the relation between return on assets and gender gap, feminization rate and unionization. Instrumental variables for Union : Support for extremist political parties. Instrumental variables for Gender gap : female CEO (employee with firm's highest wage is a woman) ; Female High skilled White-collar (percentage of firm's employees being women on a high skilled white-collar position). Dependent variable : Union, Gender gap and ROA (EBIT over total assets). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Stage	First stage	Second stage	First stage	Second stage	Second stage
Model	Probit	Linear	Linear	Linear	Linear
Dependent variable	Union	ROA	Gender gap	ROA	ROA
Column	(1)	(2)	(3)	(4)	(5)
Union		<b>-0.0483***</b> (-4.09)	<b>-0.0085***</b> (-3.60)	<b>-0.0211***</b> (-6.27)	<b>-0.0806***</b> (-8.76)
Gender gap	<b>-0.6756***</b> (-4.36)	<b>-0.0169</b> (-1.26)		<b>-0.0348</b> (-0.25)	<b>-0.3924***</b> (-2.67)
Union * Gender gap					<b>0.5743***</b> (6.76)
Support for extremist political parties	<b>1.0393**</b> (2.48)				
female CEO			<b>-0.0240***</b> (-11.06)		
Female High skilled White-collar			<b>0.1613***</b> (5.03)		
Firm size	0.8418*** (36.96)	0.0001 (0.05)	-0.0013 (-1.54)	-0.0041*** (-3.16)	-0.0026* (-1.93)
Capital intensity	-0.0162 (-1.33)	0.0050*** (4.71)	-0.0002 (-0.28)	0.0051*** (4.78)	0.0044*** (4.20)
Group : dominant firm	0.0142 (0.32)	0.0128*** (3.66)	0.0021 (0.82)	0.0117*** (3.38)	0.0121*** (3.47)
Group : non dominant firm	0.4312*** (9.64)	0.0069* (1.72)	-0.0003 (-0.10)	0.0033 (0.87)	0.0047 (1.24)
R&D	-0.0199 (-0.43)	0.0058* (1.84)	0.0050** (2.14)	0.0061* (1.88)	0.0035 (1.06)
Workforce age	0.0941*** (18.86)	-0.0027*** (-5.18)	0.0033*** (12.05)	-0.0032*** (-5.12)	-0.0033*** (-5.45)
Feminization	-0.2439* (-1.92)	0.0220** (1.97)	-0.0084 (-1.16)	0.0228** (2.05)	0.0246** (2.22)
High skilled White-collars	-0.3636** (-2.55)	-0.0048 (-0.38)	0.0767*** (4.90)	-0.0002 (-0.01)	0.0047 (0.21)
Skilled White-collars	0.3494** (2.42)	0.0022 (0.14)	0.0563*** (6.76)	0.0000 (0.00)	-0.0019 (-0.11)
Skilled Blue-collars	0.3400** (2.13)	-0.0325** (-2.24)	0.0276*** (3.28)	-0.0362** (-2.36)	-0.0341** (-2.24)
Unskilled Blue-collars	-0.3844*** (-2.58)	-0.0315** (-2.23)	-0.0181** (-2.39)	-0.0321** (-2.26)	-0.0266* (-1.86)
Constant	-7.8996*** (-24.86)	0.1381*** (5.41)	-0.0299** (-2.09)	0.1646*** (6.96)	0.2025*** (8.40)
Observations	19326	19326	19326	19326	19326
Adjusted R-squared		0.058	0.258	0.063	0.040

Table 3.7: Covariates Balancing

This table reports the regression results on the relation between return on assets and gender gap and unionization, on a reweighted sample in order to ensure covariates balance between non-union and unionized firms. Weights are obtained using entropy balancing. Dependent variable : ROA (EBIT over total assets). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Estimation method	WLS	WLS
Dependent variable	ROA	ROA
Column	(1)	(2)
Union	<b>-0.0055</b> (-0.79)	<b>-0.0148*</b> (-1.78)
Gender gap	<b>-0.0321</b> (-1.38)	<b>-0.0778**</b> (-1.99)
Union * Gender gap		<b>0.0852**</b> (1.98)
Feminization	0.0419 (1.50)	0.0422 (1.51)
Workforce age	-0.0023*** (-2.76)	-0.0023*** (-2.77)
Firm size	-0.0108*** (-2.95)	-0.0107*** (-2.93)
Capital intensity	0.0083*** (3.21)	0.0085*** (3.26)
Group : dominant firm	0.0155** (2.26)	0.0160** (2.33)
Group : non dominant firm	-0.0089 (-1.29)	-0.0082 (-1.18)
R&D	0.0028 (0.40)	0.0029 (0.42)
High skilled White-collars	0.0489* (1.87)	0.0491* (1.88)
Skilled White-collars	0.0134 (0.58)	0.0136 (0.59)
Skilled Blue-collars	0.0177 (0.89)	0.0165 (0.83)
Unskilled Blue-collars	-0.0320 (-1.34)	-0.0324 (-1.35)
Constant	0.1528*** (3.33)	0.1567*** (3.43)
Observations	19784	19784
Adjusted R-squared	0.114	0.115

Covariates balance tests					
	Pseudo R2	Mean bias	Median bias	Rubin's B	Rubin's R
Original sample	0.391	11.6	5.7	175.9	1.27
Reweighted Sample	0.001	0.7	0	5.7	1.82

Table 3.8: Alternate Gender gap measures Analysis

This table reports the regression results on the relation between return on assets and gender gap and unionization, using alternative gender gap measures.

Dependent variable : ROA (EBIT over total assets). [Appendice](#) gives definitions for all variables. T-values are displayed in parentheses, corresponding standard errors are adjusted for heteroscedasticity and clustered by firm. \*\*\* (\*\*) (\*) indicates significance at the 1% (5%) (10%) level.

Dependent variable	ROA	ROA	ROA	ROA	ROA	ROA
Column	(1)	(2)	(3)	(4)	(5)	(6)
Union	<b>-0.0197***</b> (-6.07)	<b>-0.0184***</b> (-5.52)	<b>-0.0188***</b> (-5.46)	<b>-0.0330***</b> (-8.07)	<b>-0.0296***</b> (-6.61)	<b>-0.0304***</b> (-6.87)
Gender gap	<b>-0.0116</b> (-0.89)			<b>-0.1005***</b> (-5.10)		
Gender gap (group)		<b>-0.0155</b> (-1.08)			<b>-0.0906***</b> (-3.94)	
Gender gap (law)			<b>-0.0261</b> (-0.93)			<b>-0.1804***</b> (-4.34)
Union * Gender gap				<b>0.1285***</b> (5.57)		
Union * Gender gap (group)					<b>0.1055***</b> (4.06)	
Union * Gender gap (law)						<b>0.2217***</b> (4.50)
Feminization	0.0234** (2.13)	0.0230** (2.03)	0.0252** (2.15)	0.0239** (2.18)	0.0233** (2.06)	0.0250** (2.15)
Workforce age	-0.0032*** (-6.96)	-0.0032*** (-6.71)	-0.0032*** (-6.71)	-0.0032*** (-7.01)	-0.0032*** (-6.75)	-0.0032*** (-6.68)
Firm size	-0.0045*** (-3.48)	-0.0036*** (-2.71)	-0.0048*** (-3.58)	-0.0042*** (-3.22)	-0.0034** (-2.52)	-0.0045*** (-3.32)
Capital intensity	0.0051*** (4.86)	0.0049*** (4.49)	0.0055*** (5.00)	0.0050*** (4.76)	0.0047*** (4.40)	0.0054*** (4.91)
Group : dominant firm	0.0110*** (3.23)	0.0104*** (2.93)	0.0103*** (2.87)	0.0112*** (3.29)	0.0106*** (2.98)	0.0103*** (2.85)
Group : non dominant firm	0.0023 (0.61)	0.0007 (0.18)	0.0010 (0.26)	0.0026 (0.70)	0.0010 (0.26)	0.0011 (0.28)
R&D	0.0071** (2.26)	0.0071** (2.24)	0.0072** (2.18)	0.0066** (2.09)	0.0067** (2.11)	0.0067** (2.02)
High skilled White-collars	-0.0054 (-0.43)	-0.0003 (-0.03)	-0.0056 (-0.44)	-0.0030 (-0.24)	0.0017 (0.13)	-0.0037 (-0.29)
Skilled White-collars	-0.0030 (-0.20)	0.0023 (0.15)	-0.0054 (-0.34)	-0.0029 (-0.19)	0.0022 (0.14)	-0.0052 (-0.33)
Skilled Blue-collars	-0.0390*** (-2.77)	-0.0321** (-2.19)	-0.0428*** (-2.86)	-0.0382*** (-2.72)	-0.0317** (-2.16)	-0.0421*** (-2.82)
Unskilled Blue-collars	-0.0342** (-2.45)	-0.0310** (-2.09)	-0.0395*** (-2.66)	-0.0330** (-2.37)	-0.0301** (-2.04)	-0.0382*** (-2.58)
Constant	0.2217*** (8.55)	0.2150*** (8.00)	0.2216*** (8.15)	0.2312*** (8.93)	0.2256*** (8.37)	0.2310*** (8.52)
Observations	19784	19050	18234	19784	19050	18234
Adjusted R-squared	0.063	0.058	0.065	0.065	0.059	0.066

## 3.8 Appendice

### Variables definitions

Variable name		Source
	Gender gap variables	
Gender gap	Firm-level average wage differential between men and women - computation method is discussed thoroughly in section 3.3.1	DADS
Gender gap (group)	Firm-level average wage differential between men and women - computation method is discussed thoroughly in section 3.3.1	DADS
Gender gap (law)	Firm-level average wage differential between men and women - computation method is discussed thoroughly in section 3.3.1	DADS
	Union variable	
Union	Presence of at least one union in the firm	ACEMO-DSE
	Dependent variables (firm-level)	
ROA	Return on assets computed as earnings before interests and taxes (EBIT) over total assets	FARE
Productivity	Labor Productivity computed as the natural logarithm of the ratio of value-added over full-time equivalent employees	FARE
Wages	Natural logarithm of the ratio of total salaries and benefits over the number of full-time equivalent employees	DADS
	Dependent variable (employee-level)	
HWAGE	Natural logarithm of the ratio of wage over the number of hours under job contract	DADS
	Instrumental variables	
Support for extremist political parties	Percentage of votes cast by employees for far-left and far-right political parties in the employment zone where in 3.4.4.1	http://data.gouv.fr
Female CEO	Highest wage in the firm is earned by a woman	DADS
Female high skilled white-collar	Percentage of employees that are women in a high-skilled white-collar position	DADS
	Firm-level Controls	
Industry FE	Industry Fixed effects, using Eurostat NACE Rev.2 industry classification at the division-level (88 industries)	FARE
Firm size	Natural logarithm of full-time equivalent employees	DADS
Capital intensity	Natural logarithm of the ratio of non-current tangible assets over full-time equivalent employees	FARE and DADS
R&D	Firm declaring R&D expenditures for research tax credit (binary variable)	DGFFIP
Group : dominant firm	Firm part of a business group - The firm employs the majority of the group workforce	LIFI
Group : non dominant firm	Firm part of a business group - The firm does not employ the majority of the group workforce	LIFI
Workforce age	Workers mean age in the firm	DADS
Feminization	Percentage of female in the firm	DADS
High skilled white-collars	Percentage of hours worked by managers and intellectual professions	DADS
Skilled white-collars	Percentage of hours worked by intermediary professions	DADS
Unskilled blue-collars	Percentage of hours worked by blue-collars with technical qualifications	DADS
Productivity Q#	Percentage of hours worked by blue-collars without technical qualification	DADS
Leverage	Industry-year quintiles of the natural logarithm of the ratio of value-added over full-time equivalent employees	FARE
	Employee-level Controls	
Employee Industry FE	Industry Fixed effects at the employee-level, using Eurostat NACE Rev.2 industry classification at the division-level (88 industries)	FARE
Employment zone FE	Location of the workplace : 322 employment zones	DADS
Job position FE	Employee job position : 29 job positions (Socio-professional job classification from the PCS-ESE of the INSEE)	DADS
Age	Age of the employee	DADS
Age (squared)	Squared age of the employee	DADS
Female	Employee is female (binary variable)	DADS
Employment conditions	Job conditions : full-time or part-time (binary variable)	DADS
Contract type	Contract types : unfixed-term or fixed-term (binary variable)	DADS
Foreigner	Employee can be French, European or not European (categorical variable)	DADS



# Conclusion

La représentation salariale par les syndicats impose aux employeurs un cadre de négociations intermédié. Ainsi, la relation entre l'employeur et ses employés n'est plus simplement l'agrégation de négociations individuelles. Cette dynamique collective induit de multiples effets sur la marche de l'entreprise. Les syndicats, agissant en monopole d'emploi pour les salariés représentés, cherchent à augmenter les salaires à travers la capture de rentes et quasi-rentes provenant respectivement de sur-profits liés à un pouvoir de marché ou de profits normaux liés aux surplus des investissements de l'entreprise. En outre, les syndicats s'immiscent dans la gestion de l'entreprise afin de s'assurer que les décisions et les pratiques de l'entreprise répondent aux attentes des salariés. Ainsi, si les syndicats peuvent avoir un effet sur les salaires, il est probable qu'ils modifient également la capacité de l'entreprise à créer de la valeur. En outre, le contexte institutionnel, qui définit les prérogatives des syndicats et leurs moyens d'action légitimes, peut affaiblir ou renforcer les syndicats dans leurs relations avec les employeurs. Les associés ou actionnaires sont les créanciers résiduels de l'entreprise et cherchent, à l'instar des autres parties prenantes, à maximiser leur utilité. Le dirigeant de l'entreprise, en tant qu'agent des associés ou actionnaires, doit mener le processus de maximisation de la valeur actionnariale, c'est-à-dire maximiser l'écart entre la valeur créée par l'entreprise et la valeur concédée aux autres parties prenantes. Dans un contexte de marchés de plus en plus concurrentiels, il est attendu que la capacité des syndicats à augmenter les salaires se réduise du fait de la disparition progressive des rentes de monopole et par le risque à long-terme sur l'activité, et donc sur l'emploi, que ferait courir une captation significative de profits normaux. Par ailleurs, les actions des entreprises en réponse à la présence des syndicats permettent d'optimiser la situation des associés ou actionnaires au regard de ce nouveau contexte. Enfin, la pluralité des



déterminants de l'effet des syndicats sur la rentabilité des entreprises suggère que cet effet varie dans le temps et l'espace, au gré des mutations des facteurs de contingence qui l'entourent.

Le premier chapitre s'attarde sur le caractère protéiforme de la représentation salariale. D'une entreprise à l'autre, le nombre de syndicats en présence varie et les syndicats n'ont pas les mêmes idéologies. Ainsi, en plus du taux de couverture syndicale qui est déjà largement analysé dans la littérature, deux dimensions supplémentaires sont susceptibles de déterminer l'effet des syndicats sur la rentabilité des entreprises. Par ailleurs, ces deux dimensions présentent des interactions mutuelles car la présence de multiples syndicats aux idéologies différentes est susceptible d'induire des effets particuliers sur la rentabilité des entreprises. Les résultats montrent que toutes les configurations syndicales ne se valent pas du point de vue des associés ou actionnaires. Plus le nombre de syndicats augmente dans l'entreprise, plus ces derniers sont capables d'augmenter les salaires tandis que la création de valeur ne croît pas suffisamment pour compenser cette augmentation salariale. Plus spécifiquement, la configuration la plus néfaste pour la rentabilité des entreprises est celle où la CGT, le syndicat français le plus revendicatif, représente les salariés conjointement à un ou plusieurs autres syndicats. Les résultats indiquent que cette configuration syndicale diminue la productivité, ce qui suggère une mauvaise qualité du dialogue social comme source de la faible rentabilité de ces entreprises.

Toutefois les résultats de ce premier chapitre ne permettent pas d'analyser l'effet d'un syndicat dominant dans l'entreprise ou, au contraire, l'effet d'une grande atomicité syndicale en terme d'audience, car les données disponibles au moment de la réalisation de l'étude ne le permettaient pas. La mise à disposition récente des données sur les résultats des élections professionnelles des deux derniers cycles électoraux va permettre d'étudier ces questions de recherche. Parallèlement, afin d'identifier les origines de l'effet des syndicats sur la productivité, des investigations à base d'enquêtes décrivant les pratiques de gestion et le climat social au sein des entreprises mériteraient une attention particulière.

Le second chapitre analyse comment les pratiques de lissage des résultats permettent de réduire la capacité des syndicats à obtenir des concessions salariales. Dans les entreprises ayant une volatilité élevée de leurs flux de trésorerie, le lissage des résultats, en améliorant

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le contenu informationnel des résultats comptables, permet de réduire le risque perçu de l'activité par les parties prenantes. Percevant un risque de perte d'emploi moins élevé, les salariés ne demandent plus la prime d'assurance y afférente. Cependant, la présence de syndicats n'augmente pas l'intensité du lissage des résultats. En effet, avec ou sans représentation salariale dans l'entreprise, une entreprise ayant des flux de trésorerie volatiles a toujours intérêt à lisser le plus possible ses résultats afin d'améliorer sa position de force dans le cadre des négociations avec ses créanciers financiers, ses clients et ses fournisseurs. À l'opposé, les entreprises ayant une volatilité faible de leurs flux de trésorerie répondent à la présence syndicale par une diminution du lissage alors même que la prime salariale syndicale dans ces entreprises est faible et que le lissage ne l'affecte pas, ce qui suggère une raison non-salariale à la pratique.

L'étude de l'association entre le lissage des résultats et la présence syndicale est très récente. Les résultats de ce chapitre confirment certains résultats mis en lumière dans la littérature, mais en infirment d'autres. L'étude de cette association devrait être davantage approfondie. Une première voie d'approfondissement serait de proposer une modélisation théorique qui présenterait une formalisation du processus de maximisation de l'utilité des associés ou actionnaires dans un cadre qui inclurait le risque lié à la volatilité des résultats et la réaction des diverses parties prenantes à ce risque. Une seconde voie d'approfondissement serait de diversifier l'origine des données utilisées dans les études empiriques, géographiquement et dans le temps, afin d'identifier d'éventuels effets contextuels de l'association entre lissage des résultats et présence syndicale.

Le dernier chapitre montre que les politiques d'écarts de rémunération entre les hommes et les femmes sont coûteuses car elles reviennent à payer davantage les hommes mais pas à payer moins les femmes. Ces politiques peuvent nuire ou améliorer la rentabilité en fonction du contexte organisationnel. Dans les entreprises ayant une présence syndicale, elles permettent de réduire l'influence des syndicats car elles sont liées à une individualisation des rémunérations. Dans les entreprises fortement féminisées, les syndicats diminuent significativement la productivité mais cet effet est largement réduit par les politiques d'écarts de rémunération. Dans ces entreprises, les écarts de rémunération augmentent la rentabilité des entreprises car le coût lié à l'augmentation salariale des hommes est

inférieur au bénéfice lié à l'augmentation de la productivité. Dans les entreprises faiblement féminisées, les syndicats augmentent significativement les salaires des hommes et des femmes mais cette prime salariale syndicale est sensiblement réduite par les politiques d'écart de rémunération. L'effet sur la rentabilité dans ces entreprises est nul car l'augmentation salariale des hommes se compense largement avec la baisse de la prime salariale syndicale. Toutefois, dans les entreprises sans représentation salariale, les écarts de rémunération nuisent à la rentabilité car le bénéfice afférent à la neutralisation des syndicats disparaît.

Les études sur les effets des écarts de rémunération entre les hommes et les femmes sont de plus en plus nombreuses. Si la littérature économique sur les effets salariaux de ces écarts est très dense, la littérature en finance sur le lien entre ces écarts et la rentabilité des entreprises est embryonnaire. Ce chapitre, en proposant diverses méthodes de calcul d'un écart de rémunération agrégé au niveau de l'entreprise, permet d'envisager à l'avenir des axes de recherche variés sur le lien entre ces écarts de rémunération et tous types de variables financières.

Au-delà des extensions propres à chacun des thèmes abordés au sein des chapitres de ce manuscrit, la mise à disposition des résultats des élections professionnelles au niveau de chaque établissement situé en France permettra de déterminer, à partir de 2008, et en continu, les syndicats présents et représentatifs au sein de l'entreprise ainsi que leur capacité à conclure seuls ou à s'opposer seuls à tout accord collectif dans l'entreprise. Les possibilités offertes par cette nouvelle base de données ouvrent un champ de recherche important. En termes de stratégie d'identification, la connaissance exacte, en continu, des pourcentages de votes reçus aux élections professionnelles par chaque syndicat permettra de minimiser le biais de variables omises en rendant possible l'inclusion d'effets fixes au niveau de l'entreprise et de mettre en place des techniques statistiques comme la méthode des doubles différences et la régression sur discontinuité. Par ailleurs, jusqu'à présent, les bases disponibles sur la présence syndicale étaient issues d'enquêtes et proposaient uniquement des échantillons plus ou moins larges d'entreprises, ce qui rendait souvent impossible l'appariement avec des bases non exhaustives car l'intersection des bases ne comportait pas suffisamment d'observations. Par exemple, l'analyse de l'effet de la présence syndicale sur les opérations de fusions-acquisitions était impossible car l'intersection des

bases était trop restreinte. Cette recherche est dorénavant rendue possible. En détenant une base exhaustive sur la représentation salariale au sein des entreprises françaises, les possibilités de sous-échantillonnage augmentent également, ce qui permettra plus aisément d'analyser l'effet des syndicats sur certaines catégories d'entreprises. Cela sera susceptible de nous aider à mieux appréhender l'hétérogénéité de l'effet des syndicats au sein de la population des entreprises.



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## RÉSUMÉ

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Les syndicats assurent la représentation salariale et permettent ainsi l'action collective des employés. Ce manuscrit aborde l'effet des syndicats sur la performance des entreprises et les réponses que les entreprises mettent en place en réponse à l'activité syndicale. Le premier chapitre montre que l'effet des syndicats sur la performance des entreprises dépend du nombre et du type de syndicats présents dans les entreprises. Par rapport à un syndicat unique, la présence de plusieurs syndicats diminue la rentabilité des entreprises car l'augmentation des salaires est plus forte que l'augmentation de la productivité du travail. Le second chapitre traite du lien entre lissage des résultats et présence syndicale. Le lissage des résultats réduit la prime salariale liée à la présence syndicale, en diminuant le risque perçu par les syndicats sur la pérennité de l'emploi. Enfin, le troisième chapitre montre que la pratique d'écart de rémunération entre les hommes et les femmes, en tant que méthode d'individualisation des rémunérations, permet de limiter l'influence des syndicats au sein des entreprises.

## MOTS CLÉS

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Syndicats ; Salariés ; Syndicalisation ; Multi-syndicalisme ; Performance ; Rentabilité ; Salaires ; Productivité ; Lissage des résultats ; Écart de rémunération homme-femme

## ABSTRACT

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Labor unions provide workers representation and thus allow the collective action of the employees. This thesis discusses the effect of labor unions on the performance of firms and the responses that firms put in place in response to labor unions activity. The first chapter shows that the effect of labor unions on the performance of firms depends on the number and type of labor unions in the firms. Compared to a single labor union, the presence of several labor unions decreases the profitability of firms because the increase in wages is stronger than the increase in labor productivity. The second chapter focuses on the link between income smoothing and labor unions. Income smoothing reduces the union wage premium by reducing the risk perceived by labor unions on the sustainability of employment. Finally, the third chapter shows that gender pay gap, as a method for individualizing remuneration, limits the influence of labor unions within firms.

## KEYWORDS

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Unions; Labor; Unionization; Multi-unionism; Performance; Profitability; Wages; Productivity; Income smoothing; Gender gap