

HEC Montréal

Affiliée à l'Université de Montréal

Discrimination et ségrégation sur le marché du travail

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Thèse présentée à la Faculté des études supérieures et postdoctorales
en vue de l'obtention du grade de

Philosophae Doctor (Ph.D.)
en économie appliquée

Montréal, Québec, Canada

27 août 2012

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Université de Montréal

Faculté des études supérieures et postdoctorales

Cette thèse intitulée :

Discrimination et ségrégation sur le marché du travail

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Sommaire

Cette thèse est composée de trois articles portant sur différentes formes de discrimination sur le marché du travail et plus particulièrement sur les obstacles rencontrés par certaines catégories socio-économiques afin de participer au marché du travail, d'être employés dans les mêmes proportions et recevoir une rémunération équivalente à celle des catégories ne supportant pas de discriminations.

Le premier article est un travail théorique qui s'intitule : « Syndicalisation et discrimination sur le marché du travail : Un regard approfondie sur les travailleurs non-syndiqués ». Ce premier article introduit un modèle examinant les effets de la syndicalisation sur les écarts salariaux et d'embauche entre travailleurs féminins et masculins non-syndiqués dans un contexte de concurrence imparfaite. Bien que ce modèle ne remette pas en question les avantages que les syndicats confèrent à leurs membres, il montre : (1) que la présence de syndicats accroît les discriminations salariales et la ségrégation occupationnelle pour les travailleurs non-syndiqués ; (2) que le secteur non-syndiqué ne constitue pas une bonne valeur de comparaison pour mesurer l'impact des syndicats sur les discriminations basées sur le genre ; (3) que la discrimination salariale semble persister à long-terme, alors que la ségrégation occupationnelle disparaît à long-terme ; et (4) que le gouvernement peut réduire la ségrégation occupationnelle dans les secteurs syndiqué et non-syndiqué en participant au processus de négociation collective.

Le second article est un travail théorique s'intitule : « Les effets des politiques publiques et des structures de marché sur la discrimination et la ségrégation ». Cet article développe un modèle pour étudier la discrimination statistique de second ordre. L'objectif est de proposer un cadre d'analyse dans lequel les comportements discriminatoires des employeurs ne se basent pas sur des différences de productivité moyenne mais plutôt sur des différences dans les variances de productivité des travailleurs. De plus, ce modèle prend en compte l'interdépendance entre le niveau des salaires et le nombre des embauches afin de tenir compte des deux aspects discriminatoires (discriminations salariales et ségrégation occupationnelle). Ce modèle permet d'examiner les effets de plusieurs politiques publiques antidiscriminatoires ainsi que ceux des différents niveaux de concurrences que peut revêtir le marché du travail. Quand une entreprise se voit imposer une politique qui combat les discriminations salariales, elle diminuera en retour son niveau d'emploi, alors que si elle fait face à une politique qui combat la ségrégation occupationnelle, elle devra stimuler la participation au marché du travail des travailleurs des catégories socio-économiques discriminées afin de se soumettre à la législation. Enfin, la concurrence sur le marché du travail semble être un levier d'action non négligeable pour un gouvernement voulant réduire les comportements discriminatoires sur le marché du travail.

Le troisième et dernier article est un travail empirique qui s'intitule : « Modernité et participation sur le marché du travail des femmes : l'exemple japonais ». Les données servant à l'analyse proviennent l'enquête générale sociale japonaise (Japanese General Social Survey) de 2003 faite par Ichiro Tanioka, Noriko Iwai, Michio Nitta, et Hiroki Sato. Cette enquête est disponible en accès libre auprès du Consortium interuniversitaire pour les recherches politiques et sociales (Inter-university Consortium for Political and Social Research) de l'Université du Michigan. Cette étude mesure l'impact des valeurs traditionnelles et modernes sur la participation au marché du travail des femmes japonaises. Ce travail se base sur une base de données regroupant des informations sur l'opinion des répondants concernant la vie familiale au sens large.

On y trouve notamment leurs opinions sur le divorce, le rôle de la femme dans le ménage, etc. Les résultats remettent en cause le lien de causalité entre les valeurs modernes ou traditionnelles et la participation des femmes sur le marché du travail. En effet, après avoir contrôlé pour l'endogénéité, le coefficient relatif à l'indice de modernité est mesuré non-significatif.

Mots clés : Discrimination, travail, syndicat, égalité salariale, quota, salaire minimum, subvention, offre de travail, genre, Japon.

Summary

This thesis is composed of three papers dealing with various forms of discrimination on the labor market and more specifically on the barriers faced by certain socio-economic groups to participate in the labor market, to be hired in the same proportions and to receive similar wages than the majority of workers.

The first article is a theoretical work entitled : "Unionization and Labour-Market Discrimination : A Closer Look at Non-Unionized Workers". This paper introduces a model that examines the effects of unions on pay and hiring gaps between non-unionized men and women in a context of imperfect competition. It shows that economic mechanisms can create pay gaps for equally productive workers without this being due to discriminatory behaviour on the part of firms. While the model does not question the advantages unions obtain for their members, it does show that (1) unions increase wage and occupational segregation for non-unionized workers ; (2) the non-unionized sector does not constitute a good comparison value for use in analyzing the impact of unions on gender discrimination ; (3) wage discrimination seems to persist in the long run, while the same is not true of occupational segregation ; and (4) governments can reduce occupational segregation in both the unionized and non-unionized sectors by participating in the collective bargaining process.

The second article is a theoretical work entitled : "The Effects of Public Policies and Market Structures on Discrimination and Segregation". This article develops a simple model to study second moment statistical discrimination in the labour market. The objective is to propose a framework in which the discriminatory behaviour of employers is based not on differences in average productivity, but instead on differences in the variance of productivity of workers. Furthermore, since discrimination is composed by two components, namely wage discrimination and occupational segregation, our model allows for the interdependence of hiring practices and wages. Using our model we then examine the effects of various anti-discrimination policies along with changes in the structure of the labour market. We show that the firm's behaviour could be driven in different ways by anti-discriminatory policies and labour market structures. When a firm faces an anti-discrimination policy that targets wage differences, it will cut back on hiring, while a firm facing a policy that targets hiring practices will have to stimulate minority participation to comply with such a policy. Addressing the degree of competition in the labour market appears also to be a means for governments to reduce discrimination.

The third article is an empirical work entitled : "Modernity and Female Labor Force Participation : Evidence from Japan". The data used in this paper is the Japanese General Social Survey realized in 2003 by Ichiro Tanioka, Noriko Iwai, Michio Nitta, and Hiroki Sato. This survey is available in free access through the Inter-university Consortium for Political and Social Research of the University of Michigan. This study measures the impact of traditional and modern values on the labor market participation of Japanese women. This work is based on a database containing information on the respondents' opinion about family life in general.

It includes their views on divorce, on the role of female in the household, etc.. The results question the causal link between modern and traditional values and female participation in the labor market. Indeed, after controlling for endogeneity, the coefficient on the index of modernity is non-significant.

Keywords : Discrimination, labour, union, equal pay, quota, minimum wage, subsidy, labour supply, gender, Japan.

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A Jeannine, Charles, Innocent et Jean-Paul

Remerciements

J'aimerais sincèrement remercier mes directeurs de recherche Robert Clark et Nicolas Sahuguet pour leur soutien moral et financier qui m'ont permis de me concentrer sur mon travail. Tous deux ont été des guides pour moi tout au long de ces années et je ne peux que les remercier pour les nombreux commentaires et suggestions qu'ils m'ont apportés

J'aimerais, par ailleurs, remercier l'institut d'économie appliquée pour la formation, l'aide et les conditions de recherche dont j'ai bénéficié durant ma scolarité et ma thèse de doctorat.

Mes remerciements au département d'économie de l'University of Western Ontario et au département d'économie du campus de l'Okanagan de l'University of British Columbia pour leur hospitalité et les excellentes conditions de recherche.

Je tiens à remercier HEC Montréal, le CIRPEE et la fondation Roger Charbonneau pour le soutien financier que j'ai reçu de leur part.

J'aimerais remercier particulièrement remercier mon ami David De Angelis pour ses conseils et son soutien. J'aimerais associer à ce grand merci mes amis Louis-Philippe Lavigne-Huard, Marjolaine Gauthier-Loiselle et Maxime Blais ainsi que mes collègues du programme de doctorat Arabella David-Ignatieff, Virginie Deroubaix, Ève Lamargot-Morisseau, Linda Lemarié, Frédéric Moisan, Laurence Solar-Pelletier et Ali Taleb.

Enfin, un remerciement très chaleureux à ma femme Camille, ma mère Maguy, mon père Charles, mon frère Stéphane, ma sœur Charlène, ma filleule Léane et ma grand-mère Rosalie ainsi qu'à toute ma famille pour leur amour, leur soutien indéfectible et leur présence. Je vous dois tout.

Chapitre 1

INTRODUCTION GÉNÉRALE

Durant les dernières décennies, la participation grandissante des femmes sur le marché du travail ainsi que les combats et manifestations pour les droits des populations minoritaires ont forcé les économistes à se pencher sur les questions des disparités de traitement des différents groupes de population sur le marché du travail. Ces disparités de traitement sont devenues des sujets politiques et des défis socio-économiques importants dans la plupart des pays industrialisés.

La cause généralement invoquée par les défenseurs des droits des populations minoritaires est que les employeurs ont une préférence pour les travailleurs provenant des groupes majoritaires. Cette explication, ne semble toutefois pas être suffisante pour expliquer l'entière des problèmes que l'on observe pour les populations minoritaires sur le marché du travail (Arrow (1972)).

Il apparaît donc très important de comprendre l'ensemble des causes fondamentales de ces phénomènes discriminatoires pour apporter des solutions adéquates et ciblées à ce problème majeur. Ces solutions doivent cibler directement les causes plutôt que les conséquences visibles des phénomènes discriminatoires et ceci dans le but d'éviter de créer des problèmes pour en régler d'autres.

L'étude économique des phénomènes discriminatoires a pris son élan avec Becker (1957) et Arrow (1972). Ils posent les premières modélisations des phénomènes discriminatoires en ciblant le goût pour la population majoritaire comme étant la cause du comportement discriminatoire des firmes. L'un des problèmes majeurs, décrit dans la littérature, lié à cette approche initiée par Becker et Arrow est que le goût pour la population majoritaire n'est pas justifié par des fondamentaux clairs.

Phelps (1972) et Arrow (1972, 1973) ont initié un autre courant : « la discrimination statistique ». L'idée derrière ce concept est que l'employeur a un problème d'information sur les candidats à l'embauche et que les coûts pour cerner parfaitement les candidats sont prohibitifs. Les employeurs vont de ce fait se baser sur l'ensemble de l'information disponible sur le candidat dont les caractéristiques socioculturelles visibles. La différenciation vient du fait que l'employeur dispose de connaissances statistiques disparates envers les différents groupes socioculturels.

Dans ces deux approches, on peut préciser qu'il existe des modèles de « seconde génération » qui complètent les discriminations avec un autre mécanisme. Le but est de lier les phénomènes discriminatoires avec les imperfections d'autres mécanismes de façon à parfaire l'explication de ces phénomènes. Les niveaux de concurrence sur le marché du travail, la présence de syndicat, la détermination de l'offre de travail et la présence de politiques publiques peuvent faire partie de l'explication. Ces différents thèmes seront pris en compte dans les différents articles de cette thèse.

Le premier article s'inscrit dans deux courants de la littérature sur le marché du travail : celui sur les syndicats et celui sur les discriminations. La motivation principale est de comprendre l'impact des syndicats sur les travailleurs non-syndiqués dans un contexte où l'employeur discrimine les travailleurs selon le genre. L'intérêt vient du fait que les syndicats changent les règles du jeu sur le marché du travail. La littérature économique a grandement porté son attention sur les travailleurs syndiqués mais beaucoup moins sur le sort des travailleurs non-syndiqués en présence d'un syndicat. Oaxaca et Ransom (1988) a toutefois montré qu'il y a deux effets simultanés qui conduisent à des salaires plus élevés chez les travailleurs syndiqués par rapport à ceux des travailleurs non-syndiqués. La présence d'un syndicat se traduit par l'augmentation du salaire des travailleurs syndiqués au-dessus du salaire compétitif, mais aussi par une diminution du salaire des travailleurs non-syndiqués en dessous du salaire compétitif. On observe donc un effet inverse pour les travailleurs non-syndiqués en comparaison de celui pour les travailleurs syndiqués. Cet article cherche donc à

comprendre si la présence d'un syndicat peut aussi avoir un second effet inverse, c'est-à-dire l'accroissement des inégalités pour les travailleurs non- syndiqués.

Le second article cherche à introduire théoriquement le concept de discrimination statistique de second ordre pour les discriminations sur le marché du travail. En effet, la discrimination statistique est une théorie qui s'applique au marché du travail mais aussi au-delà. La discrimination statistique de deuxième ordre est un concept dérivé qui pointe une discrimination base sur des différences de variances plutôt que moyenne de productivité. Ce concept a d'ores et déjà été introduit dans d'autres marchés comme celui des voitures usagées par Goldberg (1996). Pour introduire ce concept, l'approche choisie est de considérer un marché du travail dans un environnement en moyenne-variance et donc considérer l'aversion au risque de l'employeur. La combinaison aversion au risque et discrimination de deuxième ordre dans le contexte du marché du travail a été identifiée par un travail expérimental réalisé par Dickinson and Oaxaca (2009). Ils expliquent notamment que si l'on néglige l'aversion au risque et la discrimination statistique de deuxième ordre, cela conduit à la sous-estimation de la discrimination statistique. Le second but de cet article est de comprendre les impacts des politiques publiques visant à combattre les discriminations sur le marché du travail ainsi que ceux des différents niveaux de concurrence du marché du travail lorsque l'on prend en compte cette discrimination statistique.

Le troisième article cherche à mesurer l'impact des valeurs traditionnelles et modernes sur la participation au marché du travail des femmes japonaises. La motivation vient du fait que le deuxième article montre que certaines législations antidiscriminatoires pourraient forcer les entreprises à stimuler la participation des femmes sur le marché du travail. Le but de cet article est donc de préciser le mécanisme décisionnel de participation des femmes. Bien qu'il apparaisse évident que les valeurs jouent un rôle important dans la décision de participer au marché du travail pour les femmes, il n'est pas si facile de les mesurer. Cet article utilise une base de données qui permet un agrégat de variables afin d'établir un indice de modernité qui servira de mesure

pour le degré de modernité dans les valeurs des répondantes. Le choix d'utiliser des données Japonaises est motivé par le fait que la culture traditionnelle japonaise est encore très présente en comparaison des autres pays industrialisés et donc cela permet d'avoir une large distribution des valeurs. Par ailleurs, l'une des particularités du marché du travail Japonais est que le taux d'emploi des femmes est resté stable depuis le début des années 80 (48.5% en 1982 et 48.8% en 2007) et l'attachement aux valeurs traditionnelles est une des explications de ce phénomène.

Chapitre 2

UNIONIZATION AND LABOUR-MARKET DISCRIMINATION : A CLOSER LOOK AT NON-UNIONIZED WORKERS

2.1 Introduction

A large number of studies dealing with unions and labour-market discrimination use non-unionized workers as a comparison value in analyzing the impact of unions on the labour market and discrimination. Most of this research implicitly assumes that unions have no impact, whether direct or indirect, on non-unionized workers. However, it is perfectly justifiable to believe that unions may change the rules of the labour market, not only for unionized workers, but for their non-unionized counterparts as well. In fact, unions may divide the labour market into sub-markets, making workers less atomistic. The more headway made by unions in a given sub-market, the fewer the opportunities for non-unionized workers, and the greater employers' bargaining power with these workers.

As an example of what was advanced previously, Ashenfelter (1972) hypothesized that the effects of unions on white and black non-unionized workers were the same. However, he conceded that little research had been done on the size or incidence of the effects of unionism on non-unionized workers. This hypothesis has frequently been used (most often implicitly) in studies dealing with unionization and discrimination. Nonetheless, a partial response to the doubts expressed by Ashenfelter (1972) can be found in the empirical estimates provided by Oaxaca and Ransom (1988), which show that there are two simultaneous effects leading to higher wages among unionized workers in relation to those of non-unionized workers.¹ First and foremost, the presence

¹The study by Oaxaca and Ransom (1988) was based on data from a cross-section of the *Panel*

of a union allows unionized workers' wages to be increased above the competitive level. At the same time, this results in a decrease in wages for non-unionized workers below that level. Because Oaxaca and Ransom (1988) do not discuss labour-market discrimination, however, their study alone cannot confirm all the doubts expressed by Ashenfelter (1972).

In this paper, we consider a three-step wage-determination model in an environment of taste-based discrimination. Both the unionized and non-unionized sectors are represented in this model. The wage-setting mechanism has been explicitly modeled on the basis of worker productivity and endogenous reservation wages. Using this model, we establish whether unions can have an impact on the circumstances of non-unionized workers, as well as whether there are any related implications for continuing discrimination and public policy.

Our research extends the existing literature (described below) by adding a union/non union dimension and leads to four conclusions. First, unionization has negative repercussions on wage discrimination and the representativeness of women in the non-unionized sector. Second, non-unionized workers do not constitute a proper basis of comparison for examining the effects of unionization on discrimination. Third, the long-run persistence of wage discrimination depends on the setting of reservation wages, while occupational segregation seems unable to persist in the long term. Fourth, governments can reduce occupational segregation in both sectors (unionized and non-unionized) by means of employment targets.

Our analysis is based on two trends in the economic literature : one involving unions and the other, labour-market discrimination. Prior to the contributions made by Freeman in "What do unions do?" (1984), studies on unions reported that unions exacerbated wage inequalities. In his monograph, as well as various papers written in the early '80s, Freeman shows that unions have two contradictory effects on wage inequalities, and that they reduce such inequalities more than they increase them.

On the basis of empirical studies, Bloch and Kuskin (1978) and Duncan and Leigh (1980) conclude that wage determination differs in accordance with workers' union status, and show that the rate of return on productivity also depends on that status.

Owing to numerous issues emanating from labour-market problems but also from outside the labour-market, the literature on labour-market discrimination is abundant. The first findings come from Becker (1957); according to his model, which establishes the bases for taste-based discrimination, employers have an exogenous preference for a particular population category. In this type of model, profit is not the goal of maximization, but a component thereof, as are firms trade-off profits for not hiring minority group workers. Becker (1957), Arrow (1973), and Cain (1986) show that, in this analytical framework, discrimination can be sustained only as a short-run phenomenon. However, Rosen (2003) discusses two contradictory effects that explain the persistence of discrimination in the approach initiated by Becker (1957). On one hand, there is a “positive” effect due to the reduction of wages for minority workers, and, on the other, a “negative” effect represented by the costs of labour stemming from the overuse of workers from the majority group. The combination of these effects provides a robust explanation of the persistence of discriminatory phenomena on the labour market.

Maki and Ng (1990) and Doiron and Riddell (1994) examine empirically the impact of unionization on gender differentials. This impact stays ambiguous since both studies seem to conclude in opposite ways. Maki and Ng (1990) conclude that unions have increased the male-female differentials when Doiron and Riddell (1994) conclude that unionization tends to narrow male-female differentials.

Black (1995), Bowlus (1997) and Bowlus and Eckstein (2002) use equilibrium search frameworks to show that the simple presence of discriminatory firms in the labor market increase job-search costs and cause a reduction in reservation wages for groups that are discriminated against. Therefore, workers from these groups should accept lower wage offers.

The two-step model established by Azam and Rospabé (2007), which examines wage discrimination and unionization in South Africa, concludes that unionization may offset the effects of statistical discrimination in a competitive environment. We have taken this model, which is used here as a basic framework because it allows for the clear separation of steps and the efficient modelling of the union-membership step (which we have reproduced almost identically) and added a third step, in an effort to take account of taste-based discrimination. This third step incorporates an endogenous wage-determination mechanism into the modelling process. We have added this step mainly because the study conducted by Lindbeck and Snower (1987) concludes that wage negotiation is pertinent for non-unionized workers.² In this paper, Lindbeck and Snower oppose their Insider-Outsider theory with the efficiency-wage theory to explain the unemployment. Since the choice of taste-based discrimination allows us to reduce the objective differentiation of population categories solely to reservation wages, there is absolutely no difference for firms in terms of productivity. As a result, our findings are not influenced by objective differences such as productivity, and reflect the direct effects of unions in a discriminatory context. This paper also focuses on the wage differences that exist between equally productive men and women in a union setting. As concerns interpretation, statistical discrimination does not seem relevant in this case, as workers are identical with respect to production.

The study is organized as follows. The second section introduces statistics to support the importance of our research; the third section presents the model of taste-based discrimination and discusses the impact of unions on both sectors; the fourth section deals with unions that behave differently toward men and women; and the fifth section discusses the long-run persistence of gender discrimination in a union context.

²This type of bargaining is also used in several other studies, including that of Holden (2004)

2.2 Illustrative Statistics and Stylized Facts

In this section, we present a few statistics and stylized facts to illustrate the relevance of the intuition behind our model and key hypotheses—i.e., (i) gender differences in reservation wages and (ii) the relationship between pay gap and unionization rate.

2.2.1 Reservation Wages

Data from the European Community Household Panel Survey (ECHPS) covering the period from 1994-1999 show that reservation wages for unemployed women are lower than those for their male counterparts.³ These data were gathered from a survey asking unemployed individuals about the minimum acceptable wage for which they would work. Gender differences in reservation wages are the result of a number of effects, such as the male-female pay gap, differences in opinions on the non-pecuniary benefits of being employed, and the existence of firms that discriminate on the labour market. This leads to our first hypothesis : Female employment applicants have lower reservation wages than males.

2.2.2 Unionization Rate and the Inter-Sectoral Pay Gap

To illustrate our intuition that there is a relationship between the unionization rate and the gender pay gap in the non-unionized sector, the following graph shows two sets of values for Canada between 1999 and 2006.⁴

See figure 2.1. Data sources : Statistics Canada and Human Resources and Skills Development Canada

³See Azmat, Güell, and Manning (2006) for further details.

⁴See data in appendix.

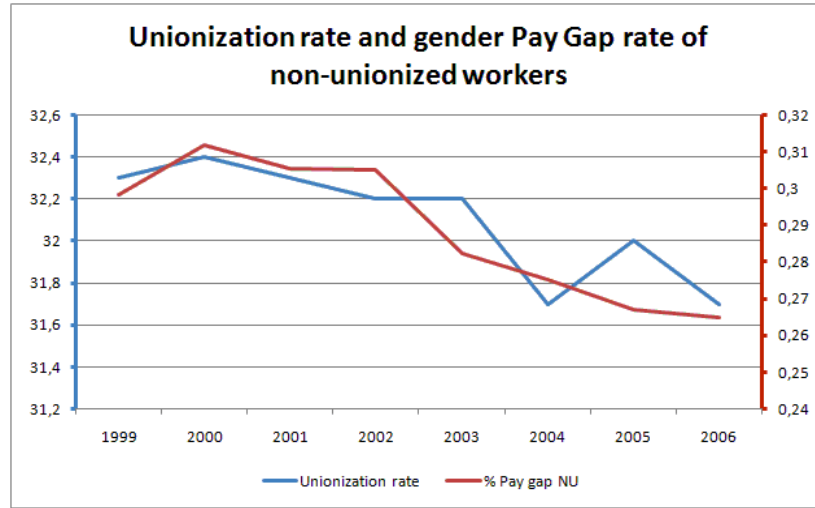


FIG. 2.1. Unionization Rate and the Inter-Sectoral Pay Gap

This graph seems to show that the unionization rate and gender pay gap in the non-unionized sector have moved in the same direction, thus supporting our hypothesis that unions may have an impact on wage discrimination among non-unionized workers. The impact of unionization appears negative for these workers, as the pay gap seems to react in proportion to union size.

Canadian Labor Force Survey (LFS) data show a positive correlation between growth in the male/female average-wage gap and growth in unionized jobs. In other words, if the percentage of unionized jobs rises, the pay gap should also increase. In the pages that follow, we will refer to this as the *first stylized fact*.

2.2.3 Wage Effects of Unionization

The estimates of Oaxaca and Ransom (1988) show that unionism causes simultaneously an increase in unionized workers' wages above the competitive level and a reduction in non-unionized workers' wages below that level. The results of the four estimates involved are summarized in Table 2.I :

“UN”, “UC” and “NC” represent the differences between unionized/non-unionized,

Competitive Wage Structure	UN	UC	NC
Union	0.3642	0	-0.3642
Nonunion	0.2412	0.2412	0
Reverse Weighted	0.3067	0.1299	-0.1353
Pooled	0.2369	0.1220	-0.0929

TAB. 2.I. Estimated Wage Effects of Unionism - Oaxaca and Ransom (1988)

unionized/competitive, and non-unionized/competitive wages, respectively. Both "Reverse Weighted" and "Pooled" methods allow measuring jointly the effect of unionism on wages of unionized and non-unionized workers compared to the competitive wage.⁵ Results, obtained with these methods, make a clear connection between unionism and the two simultaneous effects, i.e. a wage increase for unionized workers and a wage reduction for non-unionized workers. In the pages that follow, we will refer to this simultaneity as the *second stylized fact*.

2.3 Bargaining Power and Discrimination

Unions and certain other institutions divide the labour market into sub-markets. Because workers are less atomistic in these sub-markets than in a competitive market, they have bargaining power with potential employers. However, the greater the union's influence on a sub-market, the fewer the job opportunities for non-unionized applicants. We will therefore examine two effects, one stemming from labour-market segmentation, and the other caused by union influence.

2.3.1 Model

Our three-step model is based on the two-step model of Azam and Rospabé (2007). This model is our baseline : it offers an extremely useful framework for analyzing unionization and discriminatory phenomena at the same time. The first step consists of the membership decision. The second, however—hiring—is very different from that

⁵More details in Oaxaca and Ransom (1988)

discussed by Azam and Rospabé (2007); their model was established in a context of statistical discrimination, while ours involves an environment of taste-based discrimination. The third step of our model is the mechanism of wage setting for non-unionized workers. This step does not exist in Azam and Rospabé’s model, where wages are competitive.

In the first step, workers decide whether or not to join the union. There is no transfer of bargaining power between the unionized and non-unionized sectors; the advantages of unionization are not shared with non-unionized workers. Only unionized workers benefit from the union’s bargaining power.⁶ Workers opt to join unions as long as the expected utility of working in a unionized firm is greater than working in the non-unionized sector. Membership has a cost, and all economic parameters are assumed to be common knowledge. There is also no information asymmetry in market variables. Therefore, the membership decision results from a free entry of workers into the unionized sector. The economy is assumed to be divided in two sectors, i.e. the unionized and the non-unionized sector.

In the second step, employers make their hiring decisions, using workers to meet production objectives. All workers, whether male or female, are assumed to have the same chance of being hired.

The third step introduces the mechanism of wage setting. Wages are negotiated between workers and firms, with workers using their individual or union-based bargaining power. Since workers and firms are assumed to exploit that power to the full, it is treated as a parameter.⁷ Figure 1 depicts the three steps of our model.

There are two categories of workers $j \in (M, F)$. All workers produce y , and have

⁶This is similar to the effect of unionization in Lindeck and Snower insider-outsider models of European labor markets. See Lindeck and Snower (2002) for a survey.

⁷The model does not authorize workers or firms to strategically reduce their bargaining power to increase the likelihood of finding a job or attracting workers. We therefore consider bargaining power as a given in these negotiations.



FIG. 2.2. Timeline

the choice of joining the union. Men and women have the same bargaining skills. Contrary to the model established by Azam and Rospabé (2007), we assume here that productivity is identical regardless of gender, so as to ensure that the results are not influenced by productivity differences. Without this hypothesis, our findings could not be attributable to unlawful discrimination.⁸

Contrary to Azam and Rospabé (2007), here, unions do not make a distinction between workers, regardless of gender.⁹ Workers, who decide to join the union, benefit from the union's bargaining power α_u and the non-pecuniary advantages π constituted by various union services, such as labour protection. $\alpha_u = \alpha_u \left(\frac{N_u}{N_u + N_n} \right)$ is an increasing function of the proportion of labour-market unionized jobs. In other words, the union's bargaining power increases with its size. In exchange for union services, unionized workers pay union dues γ . Furthermore, workers who have decided to join the union retain the right to accept jobs in the non-unionized sector. Workers who opt not to join the union have their own bargaining power α_n . $\alpha_n = \alpha_n \left(\frac{N_n}{N_u + N_n} \right)$ is an increasing function of the proportion of labour-market non-unionized jobs. These individuals pay no dues, and their wages are negotiated individually with the employer.

The bargaining power obtained by joining a union is greater than individual bar-

⁸Equal productivity is required in order to ensure that the results are not influenced by a composition effect. Indeed, the productivity of workers influences the value of wages. Here, we are not interested by this influence. Therefore we assume equal productivity to directly measure the effects of unionism.

⁹If we consider differences in the manner unions treat various categories of workers, we see that the category preferred by the union will have better bargaining power. This point is discussed in Section 4.

gaining power : $\alpha_u > \alpha_n$. The bargaining power of firms is represented by $(1 - \alpha_i)$ with $i \in (u, n)$ being union status, n for the non-unionized sector and u for the unionized sector.

Workers cannot know if companies discriminate or not ; this information is not common knowledge. The only information available to them is company union status and the proportion of unionized jobs. The job-search literature shows that reservation wages are a positive function of anticipated future wages.¹⁰

The direct consequence of such increased costs is a decline in reservation wages for workers discriminated against. Reinforcing the notion that these workers have lower reservation wages, ECHPS data show significant differences in reservation wages between men and women.¹¹ As a result, our first hypothesis will be used in the model presented hereafter—i.e., reservation wages for female employment applicants are lower than those for males. Each labour-market candidate thus has reservation wages w_{ji} . These wages are endogenous and may depend on several market variables, such as job-search costs, unemployment income, and the number of job opportunities. Apart from this differentiation in reservation wages, in our model, men and women are completely identical.

Two firms represent the unionized and non-unionized sectors respectively. The production of each firm, determined on the goods and services market, is denoted as Y_i . These firms hire a given number of workers $N_i = \sum_{j \in (M, F)} N_{ij}$ to produce goods and services. The goal of the firms is to minimize production costs, which take into account the additional cost of employing women for companies with discriminatory behaviour. This cost function is :

$$\sum_{j \in (M, F)} N_{ij} w_{ji} + f(N_{iF}), \quad (2.1)$$

¹⁰The empirical literature has also shown that, on average, wages for men are higher than those for women, based on the same characteristics. Studies by Black (1995) and Bowlus and Eckstein (2002) agree that the greater the number of firms with discriminatory market behaviour, the higher the job-search costs for those workers discriminated against.

¹¹See Section 2 for further details.

where, $f(N_{iF})$ represents the psychological cost of hiring N_{iF} women (i.e., the representation of taste-based discrimination in the model). This function is assume to be an increasing and concave function of the number of women hired N_{iF} .¹²

2.3.2 Model Resolution

Third step : Wage setting mechanism In this section, we develop a very simple wage-setting mechanism. One of our objectives here is to ensure that this mechanism is consistent with the stylized facts given in Section 2, which are not usually taken into account in models of discrimination.

Wages are determined via a process of individual bargaining between the worker and the employer. Both players simultaneously suggest a target wage, and continue to modify their demands until they reach an agreement.

A worker's reservation wage i is :

$$\underline{w}_{ji} = \underline{w}_j \left(\frac{\text{number_of_available_jobs}_i}{\text{Total_number_of_jobs}} \right) \quad (2.2)$$

Reservation wages are denoted as $\underline{w}_{ju} = \underline{w}_j \left(\frac{N_n + N_u}{N_n + N_u} \right) = \underline{w}_j (1)$ for a worker who has decided to join the union, and $\underline{w}_{jn} = \underline{w}_j \left(\frac{N_n}{N_n + N_u} \right)$ for a worker who has chosen not to do so.¹³ Reservation wages are an increasing and concave function of the proportion of jobs accessible. The more opportunities exist, the higher the reservation wages. No other endogenous variable has been considered in determining reservation wages. In this model, the other variables that influence this determination are exogenous. As stated previously, women's reservation wages are lower than those of men. Taking as our hypothesis that the cause of the gender difference between reservation wages is

¹²Concavity implies that the psychological marginal cost is declining—i.e., once the first woman has been hired, employing an additional woman is less costly.

¹³The equation $\underline{w}_{ju} = \underline{w}_j \left(\frac{N_n + N_u}{N_n + N_u} \right) = \underline{w}_j (1)$ represents the fact that workers who have joined the union can accept offers in both sectors.

expressed solely in endogenous variables, changes in the number of job opportunities will have exactly the same effect on reservation wages for both men and women.

Firms and workers will therefore agree on a wage situated somewhere between the worker's reservation wage and his/her productivity :

$$\underline{w_{ji}} \leq w_{ji} \leq y$$

Here, worker productivity y is the maximum wage a firm would agree to pay. The reservation wage $\underline{w_{ji}}$ represents the minimum value for which an individual will not necessarily prefer the outside option rather than agreeing to work.

All values between $\underline{w_{ji}}$ and y represent the contract curve for potential wages stemming from the bargaining process. Each point on this curve represents a feasible bargained wage. The terms of the agreement depend directly on each party's bargaining power. Given that information is symmetrical, the agreement will have to be examined only once before it is ratified.¹⁴ Figure 2 represents the wage-setting mechanism developed in this section. Wages are therefore negotiated as follows :

$$w_{ji} = \alpha_i y + (1 - \alpha_i) \underline{w_{ji}}. \quad (2.3)$$

Proposition 1. *The pay gaps between men and women are not directly due to the discriminatory behaviour of firms; rather, they are attributable to differences in reservation wages.*¹⁵

Pay gaps can be expressed as follows :

$$w_{Mi} - w_{Fi} = (1 - \alpha_i) (\underline{w_{Mi}} - \underline{w_{Fi}}). \quad (2.4)$$

Wage differences stem from differences in the endogenous setting of reservation wages. This finding constitutes a credible economic explanation of the pay-gap phenomenon, and its main contribution is that it shows that economic mechanisms not

¹⁴This is an application of Coase's theorem (1960).

¹⁵See proof in Appendix.

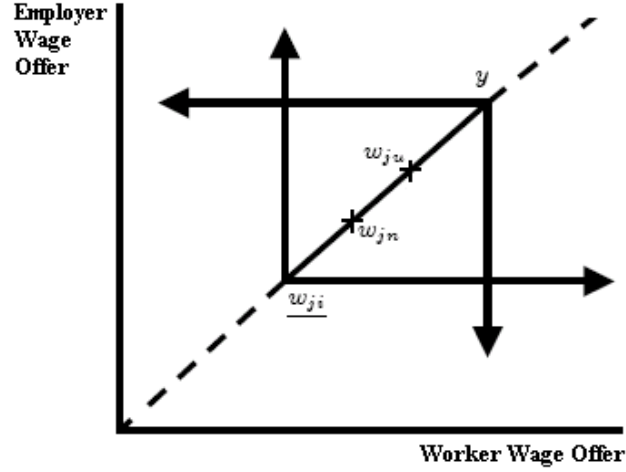


FIG. 2.3. Wage Bargaining

due to unlawful discriminatory behaviour can create pay gaps between equally productive workers. However, as this proposition deals solely with the wage dimension and does not take account of worker representativeness, it does not imply that firms have no discriminatory behaviour. It is important that this contribution be properly interpreted. We are not claiming that discriminatory behaviour never results in wage discrimination; the point we are making is that at least one economic mechanism may cause wage discrimination without such discrimination being attributable to unlawful discriminatory behaviour by firms that hire workers at different wages. Accordingly, this finding makes it imperative to broaden the scope of the search for solutions beyond regulations aimed at correcting such behaviour.

Proposition 2. *Increasing the percentage of unionized jobs on the labour market implies a wider gender pay gap in the non-unionized sector.*¹⁶

This proposition represents the first stylized fact discussed in Section 2. The wider pay gap is attributable to the loss of job opportunities for non-unionized workers resulting from increased unionization; that loss causes a reduction in bargaining power

¹⁶See proof in Appendix.

in the linear combination that determines the efficiency wage, and a wider pay gap is the result.

By using the hypothesis that bargaining power is greater for unionized workers, as well as Proposition 1, we arrive at the following statement.

Proposition 3. *The pay gap between men and women is greater for non-unionized workers than for unionized workers.*¹⁷

The gender pay gap between the two sectors can be expressed as follows :

$$\begin{aligned} & (w_{Mn} - w_{Fn}) - (w_{Mu} - w_{Fu}) \\ &= (1 - \alpha_n) (\underline{w_{Mn}} - \underline{w_{Fn}}) - (1 - \alpha_u) (\underline{w_{Mu}} - \underline{w_{Fu}}) \geq 0. \end{aligned} \quad (2.5)$$

The inter-sectoral variation in pay gap can be explained by disparity in bargaining power. The enhanced bargaining power of unionized workers gives them a higher return on worker productivity compared to non-unionized workers. The relative weight of reservation wage in the pay is therefore less important for unionized workers, meaning that differences between men and women are not as noticeable in the unionized sector. The increase in unionization is the primary reason for the reduced pay gap in the unionized sector, because of a higher return on productivity.

To summarize, the existence of unions has two effects on wages : the first is increased bargaining power for unionized workers ; the second, reduced reservation wages for non-unionized workers. By combining the two effects, we can explain the improvement in wage conditions for unionized workers as well as the deterioration in these conditions for non-unionized workers. Accordingly, we can explain the second stylized fact expressed in Section 2.

In order for this mechanism to be finalized, reservation wages for non-unionized workers must be set. On the basis of the definitions of reservation wages and total

¹⁷See proof in Appendix.

quantity produced, reservation wages are determined as follows :¹⁸

$$\underline{w}_{jn}^* = \underline{w}_j \left(\frac{Y_n}{Y_n + Y_u} \right). \quad (2.6)$$

Second Step : The Hiring Decision The number of workers hired by a firm is determined by minimizing the firm's cost function, which is subject to a production constraint :

$$\underset{N_{iM}, N_{iF}}{Min} \sum_{j \in (M, F)} N_{ij} w_{ji} + f(N_{iF}) \quad (2.7)$$

$$u.c. \left\{ \begin{array}{l} Y_i = N_i y \\ N_i = \sum_{j \in (M, F)} N_{ij} \\ 0 \leq N_{ij} \leq N_i \\ w_{ji} = \alpha_i y + (1 - \alpha_i) \underline{w}_{ji} \end{array} \right\}$$

The minimization program may be reduced to a more practical form :

$$\underset{N_{iF}}{Min} N_{iF} w_{Fi} + \left(\frac{Y_i}{y} - N_{iF} \right) w_{Mi} + f(N_{iF}). \quad (2.8)$$

If the solution is interior, the number of male and female workers hired is given by :

$$N_{iF}^* = f'^{-1} \left((1 - \alpha_i) \left(\underline{w}_{Mi}^* - \underline{w}_{Fi}^* \right) \right), \quad (2.9)$$

$$N_{iM}^* = \frac{Y_i}{y} - f'^{-1} \left((1 - \alpha_i) \left(\underline{w}_{Mi}^* - \underline{w}_{Fi}^* \right) \right). \quad (2.10)$$

Proposition 4. *Unionized firms hire a greater percentage of women than their non-unionized counterparts.¹⁹ What is more, an increase in unionization involves a reduction in the number of women hired in the non-unionized sector.*

¹⁸See proof in Appendix.

¹⁹This finding stems from the concave nature of the psychological-cost function.

Unions seem capable of reducing occupational segregation in the unionized sector. However, the greater the degree of unionization, the weaker the position of non-unionized workers in relation to firms. A firm that discriminates in the non-unionized sector may take advantage of that weakness to make taste-based decisions, thereby increasing the proportion of men.

The classic literature shows that unionization reduces inequalities between men and women in unionized firms; these effects apply both to wages and the representation of women. However, in the light of our findings, this state of affairs is incomplete when we take a broader view of the labour market. In the non-unionized sector, the effects are reversed : an increase in unionization augments discrimination for workers not protected by a union. The negative impact of increased unionization affects wages as well as the representation of women—i.e., there is an increase in the pay gap as well as a reduction in worker diversity.

First Step : The Membership Decision The main goal of workers who join a union is to gain access to jobs in the unionized sector and take advantage of the benefits of union membership. Workers join a union if and only if the utility of such an action is greater than that of trying to find a job solely in the non-unionized sector. The behaviour of workers is represented by an increasing and concave function $\nu(w_{ji})$. The total number of workers who join the union is denoted as L_j .

As with Azam and Rospabé (2007), the anticipated utility of joining a union is :

$$E_j = \frac{\varphi_j}{L_j} + \nu(w_{jn}) + \pi - \gamma \quad (2.11)$$

where φ_j represents the aggregate pecuniary benefit

$$\varphi_j = (\nu(w_{ju}) - \nu(w_{jn})) N_{uj}^*. \quad (2.12)$$

Equilibrium membership for each group is stable for $\gamma > \pi$ and determined by :²⁰

$$L_j^* = \frac{(w_{ju} - w_{jn}) \nu'(w_{jn}) N_{uj}^*}{\gamma - \pi}. \quad (2.13)$$

²⁰See proof contained in Azam and Rospabé (2007).

The membership level is an increasing function of the number of jobs available in the unionized sector, the non-pecuniary benefits of union membership, and the pay gap between the two sectors. This level is a decreasing function of the cost of membership.

Union members who are not able to get a job in the unionized sector, are assumed to either find a job in the non-unionized sector or being unemployed and receive financial assistance from the government. Those union members can be consider as the losers of the union membership process. They pay union dues but, in practice, do not benefit of the advantages provided by the union.

2.4 The Union Discriminates Between Men and Women

2.4.1 The Union Accords Different Bargaining Powers

In contrast to the literature, we have assumed that unions treated men and women the same way. If we ignore this hypothesis, the model outcomes do not really change. For the union, however, a gender effect is added. Differences in how men and women are treated will have an impact on the degree of discrimination involved : if the union favours men, discrimination will be greater than in the model presented above ; if it favours women, discrimination will be reduced.

In our model, union distinctions between men and women can be introduced by replacing the bargaining power of unionized workers α_u by two gender-specific bargaining powers. These differences may affect membership. Workers given preferential treatment will have greater incentive to join, while the others will reject unionization. This stems directly from the effect of bargaining power on the pay gap, which is positively related to equilibrium membership.

2.4.2 The Union Pays Attention to Diversity

While unions often condemn wage and employment discrimination on the labour market, for the most part, their main focus is wage discrimination. On November 26, 2007, for example, the Confédération Française des Travailleurs Chrétiens (CFTC), one of five unions for French private-sector workers, made 35 recommendations to the French government for fighting discrimination between men and women. This document contains a number of suggestions for direct action on the pay gap and gender differences in labour legislation (maternity and paternity leave, etc.). However, none of the suggestions deals with diversity or the representativeness of women in firms.

In addition to attempting to balance wages for men and women, unions can exert pressure on firms for more diversity. The second step of our model can be modified to take this possibility into account and grasp the impact generated by unions who negotiate for diversity.

Let λ_i be the union's bargaining power, and σ , the union's target hiring percentage of female workers. The actual ratio of gender j is $\frac{N_{ij}}{N_i}$. The firm's objective is the same as previously—i.e., it is explicit, and consists in minimizing the following expression :

$$\left(\frac{N_{iF}}{\sigma N_i} - \frac{N_{iM}}{(1-\sigma) N_i} \right)^2 = \left(\frac{N_{iF} Y_i}{\sigma y} - \frac{N_{iM} Y_i}{(1-\sigma) y} \right)^2 \quad (2.14)$$

The union's goal is thus to have actual ratios equal these pre-established target percentages. We have used a quadratic form to ensure that there is a single minimum that is reached at zero. All other values of this function are strictly positive. If target percentages are attained, the result is zero; otherwise, as we get further from those percentages, the value will be greater. This function perfectly represents the union's diversity objective.

In this step, the bargaining solution concept is a generalized Nash solution. Each organization attempts to minimize its objective function when bargaining with the opposite party. In our case, the firm is bargaining with the union. The objective

function of the complete bargaining process is therefore :

$$\begin{aligned} \underset{N_{iM}, N_{iF}}{Min} \left(\sum_{j \in (M, F)} N_{ij} w_{ji} + f(N_{iF}) \right)^{1-\lambda_i} \left(\frac{N_{iF} Y_i}{\sigma y} - \frac{N_{iM} Y_i}{(1-\sigma)y} \right)^{2\lambda_i} \quad (2.15) \\ u.c. \left\{ \begin{array}{l} Y_i = N_i y \\ N_i = \sum_{j \in (M, F)} N_{ij} \\ 0 \leq N_{ij} \leq N_i \\ w_{ji} = \alpha_i y + (1 - \alpha_i) \underline{w}_{ji} \end{array} \right\} \end{aligned}$$

If the solution is interior, the number of workers hired is given by :

$$N_{iF}^* = f'^{-1} \left((1 - \alpha_i) \left(\underline{w}_{Mi}^* - \underline{w}_{Fi}^* \right) + \frac{1 - 2\sigma}{\sigma} w_{Mi}^* \right), \quad (2.16)$$

$$N_{iM}^* = \frac{Y_i}{y} - f'^{-1} \left((1 - \alpha_i) \left(\underline{w}_{Mi}^* - \underline{w}_{Fi}^* \right) + \frac{1 - 2\sigma}{\sigma} w_{Mi}^* \right). \quad (2.17)$$

Proposition 5. *The strength of the union's bargaining power has no impact whatsoever on hiring percentages.²¹ Unions have only to participate in the bargaining process with target percentages in order to have an effect on actual ratios.*

This proposition implies that bargaining to improve diversity can have a real impact. If the union has several bargaining points to be negotiated, it will not have to put much emphasis on diversity to obtain results; it can therefore focus more on wages and other issues.

Proposition 6. *To improve firms' diversity, the target percentage of women hired must be higher than the empirical proportion of female candidates.²²*

A target of 50 per cent has absolutely no impact on the actual ratios of women in the firm; with this target percentage, the number of women hired remains the same.

²¹This stems from the fact that λ_i does not appear in the solutions.

²²In this case, 50 per cent. This stems directly from the term $\frac{1-2\sigma}{\sigma}$

If the target has been set at less than 50 per cent, the proportion of men hired is increased. If the union uses targets higher than 50 per cent, however, the proportion of women hired will rise. Unions, whose goal is to offset taste-based discrimination by setting exaggeratedly high proportions, may negotiate on the basis of those proportions in order to impose more diversity on firms (this illustrates strategic behaviour on the part of unions).

Another solution would be to have such diversity-oriented bargaining led by the government. If this initiative were to come from the government, bargaining would have to be conducted on the same bases as that conducted by the union—i.e., using exaggerated targets. The advantage here would be that, as all workers, not just the unionized sector, would benefit from increased diversity, the proportion of women in the non-unionized sector could also be increased. In intervening in the process, the government would therefore have a means of “levelling the playing field” in both sectors.

Proposition 7. *If an organization negotiates with a firm for diversity, and that firm does not apply target percentages accurately, it has discriminatory tastes.*²³

If the firm does not have discriminatory tastes, actual ratios will be close to target proportions. This proposition is interesting in the sense that it could act as a basis for identifying firms with discriminatory behaviour. However, the choice of the generalized Nash solution may not be inconsistent with this finding. Moreover, this basis should be nuanced before being applied, since one of the hypotheses of this model is that all workers, both male and female, are equally productive.

2.5 Long-Term Implications

One of the main topics dealt with in studies on discrimination is the long-term persistence of discrimination. Most of this research concludes that, in a perfectly

²³See proof in Appendix.

competitive labour market, discrimination disappears in the long run. Our findings differ somewhat from this conclusion, although it must be stated that the labour market in our model is not perfectly competitive.

Like those of Becker (1957), our findings show that occupational segregation does not seem to persist over the long term. Rosen’s reasoning (2003) does not work in our case, because taste-based discrimination does not have an effect on wages; in our model, taste-based discrimination is expressed only in the proportions of men and women hired. As expressed in the classic literature, occupational segregation disappears as a result of the additional costs involved in hiring a higher percentage of men. Firms that discriminate will therefore either be driven out of the market or change their behaviour toward women.

In keeping with our model, the gender pay gap does not necessarily stem from discriminatory behaviour. One of the causes of that gap seems to be the disparity in reservation wages for men and women. This state of affairs, with different wages for men and women, may persist in the long run.

One of the crucial points of wage discrimination would appear to be the determination of reservation wages for workers. If this difference is due solely to the presence of firms with discriminatory behaviour, wage discrimination between men and women should disappear; if disparities between reservation wages are also attributable to structural differences, however, wage discrimination will be long term.

Although unions do have effects on discrimination, these do not seem to be temporal in nature—i.e., if unions fail to eradicate discrimination in the short term, they will not succeed over the long term, either.

2.6 Conclusion

We show how economic mechanisms may create pay gaps for equally productive workers, without this stemming from any discriminatory behaviour on the part of

firms. From a public-policy standpoint, this contribution is important, as it shows that there are certainly levers that could be used to reduce or eliminate discrimination other than acting on corporate behaviour. We have also emphasized, in particular, the potential impact of reservation-wage setting ; indeed, if women’s reservation wages are established differently from those of men, this may explain a pay gap.

Our model also show that unionization can have an effect on discrimination in the non-unionized sector. This implies that workers from that sector should not be used as a comparison value in analyzing the impact of unionization on unionized workers without controlling for the effect on non-unionized workers.

The effect of unions on discrimination in the non-unionized sector is negative ; the larger the union, the greater the discrimination, as regards both wages and diversity.

Furthermore, in a context of taste-based discrimination, unions cannot eliminate discriminatory phenomena. The conclusions reached by Azam and Rospabé (2007) are very different from ours : they found that, in a statistical-discrimination setting, unions manage to eliminate discrimination. The divergences between the conclusions of our study and that of Azam and Rospabé (2007) may be interpreted as the efficacy levels of unions dealing with different types of discrimination—i.e., unions seem entirely effective in an environment of statistical discrimination, but much less so in a taste-based discrimination context.

We have also shown that it is possible for unions or governments to negotiate effectively with firms so as to enhance diversity. In order to ensure an impact on firms displaying discriminatory behaviour, they must established exaggeratedly high target percentages. Our findings show that firms that do not discriminate implement the target figures of the union or government in question, while those that discriminate do not. Accordingly, we have established a baseline for a test to identify firms with a discriminatory behaviour.

Lastly, our study discusses some of the implications of the long-run persistence of discrimination. Our conclusions were rather unusual, as we found there are different

Year	Unionization rate	% Pay gap NU
1999	32,3	0,298
2000	32,4	0,312
2001	32,3	0,3053
2002	32,2	0,3049
2003	32,2	0,282
2004	31,7	0,275
2005	32	0,267
2006	31,7	0,265

TAB. 2.II. Unionization Rate and Gender Pay Gap for Non-Unionized Workers

implications for wage and employment discrimination—i.e., while the former seems to persist over the long term, the latter does not.

2.7 Appendix

2.7.1 Unionization Rate and Gender Pay Gap for Non-Unionized Workers

See Table 2.II

2.7.2 Proof of Proposition 1

$$w_{Mi} - w_{Fi} = \alpha_i y + (1 - \alpha_i) \underline{w_{Mi}} - \alpha_i y - (1 - \alpha_i) \underline{w_{Fi}}$$

$$w_{Mi} - w_{Fi} = (1 - \alpha_i) (\underline{w_{Mi}} - \underline{w_{Fi}})$$

By assumption : $\underline{w_{Mi}} \geq \underline{w_{Fi}}$

$$\implies w_{Mi} - w_{Fi} \geq 0$$

2.7.3 Proof of Proposition 2

$$w_{Mn} - w_{Fn} = \left[1 - \alpha_n \left(\frac{N_n}{N_n + N_u} \right) \right] (\underline{w_{Mn}} - \underline{w_{Fn}})$$

By hypothesis : changes in the number of opportunities will have the same effect on reservation wages for both men and women, therefore $(\underline{w}_{Mn} - \underline{w}_{Fn})$ stay constant when $\frac{N_u}{N_n+N_u}$ increase.

Then, when $\frac{N_u}{N_n+N_u}$ increase

$\Rightarrow \frac{N_n}{N_n+N_u}$ decrease

$\Rightarrow \alpha_n \left(\frac{N_n}{N_n+N_u} \right)$ decrease

$\Rightarrow 1 - \alpha_n \left(\frac{N_n}{N_n+N_u} \right)$ increase

$\Rightarrow w_{Mn} - w_{Fn}$ increase

2.7.4 Proof of Proposition 3

$$(w_{Mn} - w_{Fn}) - (w_{Mu} - w_{Fu}) = (1 - \alpha_n) (\underline{w}_{Mn} - \underline{w}_{Fn}) - (1 - \alpha_u) (\underline{w}_{Mu} - \underline{w}_{Fu})$$

By hypothesis : $1 - \alpha_n > 1 - \alpha_u$

$(\underline{w}_{Mn} - \underline{w}_{Fn}) - (\underline{w}_{Mu} - \underline{w}_{Fu})$ must be ≥ 0

By hypothesis : $\underline{w}_{Mn} - \underline{w}_{Mu} = \underline{w}_{Fn} - \underline{w}_{Fu}$

$$\Rightarrow (\underline{w}_{Mn} - \underline{w}_{Fn}) - (\underline{w}_{Mu} - \underline{w}_{Fu}) = 0$$

$$\Rightarrow (w_{Mn} - w_{Fn}) - (w_{Mu} - w_{Fu}) \geq 0$$

2.7.5 Proof of Proposition 7

With a firm that does not display discriminatory behaviour, the objective bargaining function is :

$$\left(\sum_{j \in (M, F)} N_{ij} w_{ji} \right)^{1-\lambda_i} \left(\frac{N_{iF}}{N_i \sigma} - \frac{N_{iM}}{N_i (1-\sigma)} \right)^{2\lambda_i}$$

By hypothesis : $\sum_{j \in (M, F)} N_{ij} w_{ji} > 0$ and $\left(\frac{N_{iF}}{N_i \sigma} - \frac{N_{iM}}{N_i (1-\sigma)} \right)^2 \geq 0$.

The minimum of this function is 0, and is reached for the following values :

$$\frac{N_{iF}}{N_i} = \sigma \text{ and } \frac{N_{iM}}{N_i} = 1 - \sigma.$$

As a result, the actual ratios for a firm with no discriminatory tastes will necessarily be equal to its objectives.

2.7.6 Proof of Equation 6

Based on the definition of reservation wages and quantity produced :

$$\left\{ \frac{w_{jn}=w_j \left(\frac{N_n}{N_n+N_u} \right)}{Y_i=N_i y} \right\} \implies \underline{w_{jn}} = \underline{w_j} \left(\frac{\frac{Y_n}{y}}{\frac{Y_n+Y_u}{y}} \right) \iff \underline{w_{jn}^*} = \underline{w_j} \left(\frac{Y_n}{Y_n+Y_u} \right)$$

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Chapitre 3

THE EFFECTS OF PUBLIC POLICIES AND MARKET STRUCTURES ON DISCRIMINATION AND SEGREGATION

3.1 Introduction

Research on statistical discrimination has focused on decision-making based on the average characteristics of different groups when there is a lack of information on the characteristics of individuals. In markets other than the labor market the analysis of statistical discrimination has been extended to consider decision making based on more than just the first moment of the characteristic. For instance, in her analysis of dealer discrimination in negotiations over used car sales Goldberg (1996) suggests that dealer bargaining strategies depend not on the first-moment of buyer reservation prices but also the second. The implication is that if attention is restricted to first-moments, the existing patterns of discrimination cannot be fully explained.

In the labour literature there has been a reluctance to consider risk-aversion ; standard frameworks consider the firm to be risk-neutral. This view presumes that managers can fully hedge risks in financial markets and so can be neutral with respect to risk in the other markets in which they interact. However, in the context of the employment market, fully hedging the risks generated in the hiring process through financial markets would be relatively complex and costly and therefore may be unrealistic. In contrast gathering more statistical information about potential employees can help to eliminate risk.

In experimental work, Dickinson and Oaxaca (2009) examined various ways of measuring risk to reveal the existence of second-moment statistical discrimination in the labor market. They conclude that statistical discrimination is under-estimated if risk-aversion is not included in the model.

In our view, second-moment statistical discrimination may explain, at least in part, why discrimination persists despite the application of various public policies. If this is correct, public policies whose objective is to eliminate first-moment statistical discrimination may not be totally effective because they cannot be properly calibrated. For instance, Heckman (1998) suggests that variance differences may present a limitation for the audit method for detecting discrimination. Indeed, the bias induced by second-moment statistical discrimination, but missed by the policymaker, is not taken into account in the calibration and the implementation of such a policy. Therefore, these public policies provide only a partial solution to the problem of discrimination.

With this in mind, the objective of this paper is to propose a framework in which the discriminatory behaviour of employers is based not on differences in average productivity, but instead on differences in the variance of productivity of workers – second-moment statistical discrimination. Therefore, we consider an employer with a mean-variance utility function and analyse hiring decisions in this case. In this context we can consider the hiring decision of an employer as we would the decision of the manager of an investment portfolio. A risk averse portfolio manager chooses an asset mix that depends on the expected return and risk of each asset. We take workers to be assets and suppose that a risk averse employer hires a mix of worker types taking into account the means and variances of their productivities. We express the variance of productivity (second-moment statistical discrimination) to be the productivity distribution risk in the decision-making of the manager. Risk-averse managers should pay lower wages to workers whose productivity variance is believed to be higher, even though average productivity is equivalent to those workers whose productivity variance is believed to be lower. Furthermore, since discrimination is composed by two components, namely wage discrimination and occupational segregation, our model allows for the interdependence of hiring practices and wages while taking into account both components of discrimination in the labour market. In the context

of portfolio choice, it is quite natural to observe that some assets are held in lower proportions despite the fact that they are less expensive. The same is true for risk averse employers. Workers that are believed to be riskier can be both less employed and receive lower compensation. Occupational segregation depends on the asset mix while wage discrimination depends on the risk premium.

Using our model we then examine the effects of various anti-discrimination policies along with changes in the structure of the labour market. The framework is compatible with analyses using taste-based and statistical discrimination. We show that the firm's behaviour could be driven in different ways by anti-discriminatory policies and labour market structures. When a firm faces an anti-discrimination policy that targets wage differences, it will cut back on hiring, while a firm facing a policy that targets hiring practices will have to stimulate minority participation to comply with such a policy. Addressing the degree of competition in the labour market appears also to be a means for governments to reduce discrimination.

In terms of public policy, we analyze two that target employment and two that target wages. For each of these two categories, we tested the effects of typical policies (quota and equal pay) and alternative policies that we propose (minimum wage and minority employment subsidies). The public policies analysis we provide in this paper is free of their impact on first-moment statistical discrimination, all effects which result from our model are due to second-moment statistical discrimination since in the model we suppose that the firm knows that average productivities are equal across worker types. We show that our suggested policies lead to better results than their typical counterparts and that policies addressing minority employment provide fairer and potentially more effective results. Moreover, a minority employment subsidy is an incentive-oriented means for governments to act. Typical anti-discrimination policies are essentially constraining for the firm. However, with a minority employment subsidy policy, the firm becomes part of the solution instead of being an object of "attack." In other words, the subsidy represents more of a carrot than a stick. It has

a greater impact and leads us to believe that incentive policies could be more effective than constrained ones.

We also compare various labour market structures to verify if competition makes discrimination disappear. The impact of competition on discrimination represents a classic limitation of standard frameworks of discrimination in the labor market. Many conclude that discrimination should disappear in a competition context. It motivates Lang (1986) to say : "Neither the Becker-Arrow tastes model nor the Arrow-Phelps statistical discrimination model provides an adequate explanation of the persistence of discrimination". Our baseline framework assumes a monopsonistic labour market. Then we test the effects of oligopsonistic and competitive labour markets. We show that the more competitive the market, the less discriminatory phenomena occur even if competition is not great enough to make them disappear. With this in mind, governments should take actions that foster competition in the labour market in addition to establishing anti-discrimination policies.

This paper is organized as follows. First, we develop the baseline model. Then we test the effects of public policies on wages, hiring, and labour market structures.

3.2 Literature

In economics the theoretical analysis of discriminatory phenomena started with Becker (1957) and Arrow (1972). They developed the first models that showed taste-based discrimination can be the cause of wage and employment discrimination. Welch (1976) provided a theoretical analysis of quotas and showed that quotas redistribute income from majority to minority workers. A major criticism of this approach is that the exogenous preference of the majority group is not justified by clearly-expressed reason.

Phelps (1972) and Arrow (1972, 1973) initiated the idea of "statistical discrimination." Statistical discrimination argues that employers have an information deficit

vis-à-vis job candidates. The cost of having a comprehensive, “perfect” assessment of candidates is prohibitive. Employers base their hiring decision on all readily available information about candidates including visible socio-cultural characteristics. Discrimination may arise from firms’ unequal statistical knowledge of various socio-cultural groups.

In general, wage discrimination and occupational segregation are usually studied independently in a standard statistical discrimination framework. However, they are strongly inter-related and our aim was to model them together in order to assess all the impacts resulting from their interdependence. Aigner and Cain (1977) and Lundberg and Startz (1983) are examples of statistical discrimination studies which focus primarily on wage discrimination. Aigner and Cain (1977) were the first to introduce the notion of risk aversion in the hiring process. Differences in the average wage equal differences in productivity. According to Lundberg and Startz (1983), discrimination arises from differences in employers’ assessment of the abilities of different groups. Studies conducted by Schwab (1986), Cornell and Welch (1996) and Morgan and Vàrdy (2009) are examples of statistical discrimination analyses which focus primarily on occupational segregation. Schwab (1986) used differences in labour supply elasticity to assess the effectiveness of statistical discrimination and concluded that statistical discrimination is unambiguously ineffective in this context. Cornell and Welch (1996) showed that the hiring decision strongly favours the majority because of difficulties in evaluating candidates. In their analysis of public policies, they suggest that a policy of equal pay would go against the representativeness of minorities. Morgan and Vàrdy (2009) have developed a job search model of statistical discrimination. They show that minority workers are under-represented and are fired more frequently than their non-minority peers.

In contrast to research on the sources of discrimination, very few theory-based studies have analyzed the effects of anti-discrimination public policies on firms’ behaviours. The most recognized contribution in this regard is that of Coate and Loury

(1993), who show that affirmative action may discourage minority workers from acquiring human capital. Lundberg and Startz (1983), Lundberg (1991) and Cornell and Welch (1996) provide policy prescriptions but not thorough analyses of various public policies in action. However, there is a wide body of empirical research on the subject (such as Leonard, 1984; Smith and Welch, 1984; Leonard, 1990).¹ They show that anti-discrimination laws have beneficial effects on the hiring and wages of women and minorities. Holzer and Neumark (1999, 2000) find that employers under affirmative action regimes use more intensive screening of job candidates, which increases chances uncovering other information about minority workers and that they are more likely to have formal monitoring for evaluating their employees.

In addition, there is a body of literature on the employment of risky workers without reference to socio-cultural criteria, which adds to research on statistical discrimination. Hendricks, DeBrock and Koenker (2003) studied hiring decisions in the context of uncertainty. However, they focused on the relationship between prior beliefs and outcomes, then generated empirical predictions.

To be clear about the positioning of our paper in the literature, it provides a thorough theoretical analysis of public policies in a very flexible mean-variance context which is compatible with taste-based and statistical discrimination.

3.3 Baseline Model

The theoretical challenge of the baseline model is to explain occupational segregation and wage discrimination as an equilibrium when (1) minority and majority are ex ante identical and (2) employers believe that all workers have the same average productivity. To do so, we develop a simple and flexible model which includes second moment statistical discrimination. We then enter various public policies and labour market structures into the model. The main advantage of this model is that we can

¹See Holzer and Neumark (2000) for a complete review of theoretical and empirical studies on the effects of anti-discrimination laws.

compare a variety of public policies and market structures, thus providing greater accuracy and flexibility to the comparisons. The main drawback is that we have to use a reduced form of structural functions of the labour market to be able to make the comparison, namely an affine labour supply and an additive utility function. However, we present a more general model in the appendix which has the same properties as the baseline model but which is too complex mathematically to include public policies in it. We specifically chose reduced form functions to keep a modicum of simplicity. Other functions can be used as long as they comply with the constraints of the model.

3.3.1 Workers

There are 2 groups j of workers in the economy, $j \in (1; 2)$. Group 1 comprises advantaged workers (white, male, etc.) and Group 2 disadvantaged workers (black, female, etc.). In the remainder of this paper, we describe Group 1 as majority and Group 2 as minority. Each group is the same size in the model but size does not affect the analysis. Suppose both groups of workers have the same inverse labour supply curve :²

$$w_j = en_j + f \quad (3.1)$$

where w_j is the wage of a worker from group j , n_j the hiring of workers from group j and e and f the parameters of the affine labour supply curve. f represents the reservation wage. We assume that the workers' productivity distribution is the same whatever the group. Each worker from group j produces y_j with a mean $\bar{y}$ and variance $\bar{\sigma}^2$.³ The variance $\bar{\sigma}^2$ can be interpreted as the firm's uncertainty with regards to the

²With this assumption, we can control for effects that do not result from labour supply differentials. We assume there is no difference between the groups so we could correctly assess the effects of public policies and market structures on discrimination. This assumption can be removed without any effect on the results of the tests.

³Analyzing the complete labour market (composed of workers with various productivity distributions) is possible by disaggregating the total distribution of workers into separate labour markets defined by a specific productivity distribution. This segmentation ensures that the results are not driven by structural productivity differentials between the groups.

exact value of the worker's productivity.

3.3.2 Firm

The firm acts as a monopsonist in the labour market. The market for goods and services is assumed to be perfectly competitive. The price of goods is determined by the market and normalized to 1, without losing generality. The profit of the firm is :

$$\pi = \sum_{j=1}^2 (n_j (y_j - w_j)) . \quad (3.2)$$

The manager of the firm is risk-averse and maximizes a mean-variance profit function taking into account the labour supply. Although the manager cannot assess the worker's true productivity level, he/she does hold some prior beliefs. We suppose that he/she knows the average productivity of workers but has incomplete and possibly biased information on the variance of productivity. The manager assesses the variance to be σ_j^2 for each group of workers. σ_j^2 is determined through available information and personal beliefs. The manager's cultural and statistical knowledge as well as possible stereotypes can play a role.⁴ Therefore, it is clear that the group status (minority vs. majority) is part of the available information for the manager. We assume that $\sigma_2 > \sigma_1 > 1$. The manager makes no difference between groups based on anything other than his beliefs on the variance of productivity. Considering all characteristics, the firm chooses the number of employees to hire (n_1, n_2) and the wages he is willing to pay them (w_1, w_2) in order to maximize :

$$\pi_{MV} = E[\pi] - \alpha VAR[\pi] . \quad (3.3)$$

⁴We indicated earlier that the model is compatible with both taste-based and statistical discrimination. Whatever the mechanism of belief formation, the model is consistent with statistical discrimination. Since we assume that negative stereotypes are part of this mechanism, the model is consistent with taste-based discrimination.

The profit function can be reformatted as follows :⁵

$$\pi_{MV} = \sum_{j=1}^2 [n_j (\bar{y} - w_j) - \alpha n_j^2 \sigma_j^2]. \quad (3.4)$$

3.3.3 Monopsonist Optimal Hiring Behaviour

As a monopsonist, the firm takes advantage of its dominant position in the labour market. Therefore, it includes the labour supply in its hiring and wage decisions. With this additional information, the optimal hiring behaviour of the firm is determined by the following maximization program :

$$\max_{n_j} \sum_{j=1}^2 [n_j (\bar{y} - f - e n_j) - \alpha n_j^2 \sigma_j^2]. \quad (3.5)$$

Optimal hiring decisions are :⁶

$$n_j^* = \frac{\bar{y} - f}{2(e + \alpha \sigma_j^2)}, \quad (3.6)$$

Wages associated with these hiring decisions are :

$$w_j^* = e \frac{\bar{y} - f}{2(e + \alpha \sigma_j^2)} + f. \quad (3.7)$$

Contrary to many findings of gender and race discrimination studies, diversity in the workplace still exists even if employment and wage differentials occur. In other words, the firm hires workers of both groups; there is no case where a group is not used.⁷ This follows from the monopsony feature of the model but part of the effect is

⁵We assume that y_1 and y_2 are uncorrelated. It's very important to understand correctly the meaning of variances σ_1^2 and σ_2^2 in this model to appreciate the weakness of this assumption. σ_1^2 and σ_2^2 are firms' "specific" evaluation of risk induced by observable difference among groups (race, gender, etc...). The manager makes no other distinction among groups. Consequently, he/she does not consider possible statistical consequences implied by inter-group relations since in his/her mind they do not exist. In fact, if y_1 and y_2 are correlated the model does not change that much. See the appendix for the model which includes correlations.

⁶See the appendix for more detailed calculations :

⁷ n_j is always strictly positive with finite parameters.

also due to a diversification effect following the manager's risk aversion.⁸ However, minority workers experience hiring and wage deficits in comparison to majority workers. These deficits are directly due to the firm's assessment σ_j^2 of variances in productivity and risk-aversion α . This result shows that our model conforms to reality in the sense that it is consistent with observed evidence that minority workers are both less paid and less employed by the firm. The simple addition of the manager's risk-aversion and errors in assessment of variances of productivity leads to this rational explanation. The intuition behind this is the same as that for asset allocation in an investment portfolio; the firm makes a trade-off between observed risks (σ_j^2) and expected returns $(\bar{y} - w_j^*)$.

In the next few sections of the paper, we use this model to incorporate various public policies and market structures. We can then make comparisons in order to detect the best theoretical approach in countering discrimination.

3.4 Public Policies that Address Wages to Reduce Discrimination

3.4.1 Equal Pay Policy

Equal pay policy is the means used by governments of the most industrialized countries to decrease wage discrimination in labour markets. This is the easiest solution for policymakers to address this issue : impose a law of equal pay for equal work. Conventional wisdom argues that an equal pay policy would bring up the wages of the minority group to the level of those of the majority, whereas nothing proves that the wages would converge at the higher level.

⁸To support the existence of the diversification effect, section 7 is devoted to a market structure analysis and shows that diversity in the workplace is independent of the labour market structure.

Equilibrium We add the constraint $w = w_1 = w_2$ to the baseline maximization problem. This yields the following maximization program :

$$\begin{aligned} \max_{n_j, w} & \sum_{j=1}^2 n_j (\bar{y} - w) - \alpha \sum_{j=1}^2 n_j^2 \sigma_j^2 \\ \text{s.t.} & \begin{cases} w = w_1 = w_2 \\ w_j = en_j + f \end{cases} \end{aligned} \quad (3.8)$$

We restate the problem by introducing constraints in the objective function. The optimal hiring behaviour of the firm can then be determined by :

$$\max_{n_1, n_2} \sum_{j=1}^2 n_j \left[\bar{y} - f - \frac{e}{2} \sum_{j=1}^2 n_j \right] - \alpha \sum_{j=1}^2 n_j^2 \sigma_j^2 \quad (3.9)$$

Optimal hiring decisions are :⁹

$$n_1 = \frac{1}{2} \frac{(\bar{y} - f) \sum_{j=1}^2 \sigma_j^2}{2\alpha \prod_{j=1}^2 \sigma_j^2 + e \sum_{j=1}^2 \sigma_j^2} \quad (3.10)$$

$$n_2 = \frac{\sigma_1^2 (\bar{y} - f)}{2\alpha \prod_{j=1}^2 \sigma_j^2 + e \sum_{j=1}^2 \sigma_j^2} \quad (3.11)$$

The common wage is therefore :¹⁰

$$w = \frac{e}{2} \frac{(\bar{y} - f) \sum_{j=1}^2 \sigma_j^2}{2\alpha \prod_{j=1}^2 \sigma_j^2 + e \sum_{j=1}^2 \sigma_j^2} + f \quad (3.12)$$

Effects of an Equal Pay Policy

Wage effects : Implementation of an equal pay policy does not equalize wages to the former level of the majority wage. It causes a convergence to an unique intermediate value which is located between wages of each group in the baseline model : $w_2^* \leq w \leq w_1^*$. We should underline that not only the minority group is affected by the implementation of the equal pay policy ; the majority workers are also affected – by a decrease in their wage level.

⁹See the appendix for more detailed calculations.

¹⁰The value of the wage could differ depending on the wage-setting mechanism. In this paper, workers behaviours are not modeled. We assume that workers are offered a stated wage without negotiation and choose to accept or to decline the job based on the stated wage.

Hiring effects : Even if an equal pay policy targets wages, wages in the labour market are not the only thing affected by the policy. The policy also lowers employment numbers for the two groups : $n_j \leq n_j^*, \forall j$.

3.4.2 Minimum Wage

For many years, and particularly since the World March of Women in 1998, women have demanded the creation or strengthening of minimum wage to end discrimination against them. In this section, we challenge the relevance of an equal pay policy by studying the minimum wage as perhaps a better means of reducing wage discrimination. The aim is to prevent the negative effects of equal pay on majority workers. Our intuition is that we could reproduce the effects of an equal pay policy on minority workers without any unwanted effects on majority workers. We set the minimum wage between minority and majority wages in the baseline model.¹¹

Equilibrium Let $\underline{w}$ be the minimum wage. The maximization problem becomes :

$$\begin{aligned} \max_{n_j} \sum_{j=1}^2 [n_j (\bar{y} - w_j) - \alpha n_j^2 \sigma_j^2] . \\ s.t. : \left\{ \begin{array}{l} w_j = \max(\underline{w}; w_j^*) \\ w_j = en_j + f \end{array} \right\} \end{aligned} \quad (3.13)$$

Optimal hiring decisions are :¹²

$$n_1^{MW} = n_1^* = \frac{\bar{y} - f}{2(e + \alpha\sigma_1^2)} \quad (3.14)$$

$$n_2^{MW} = \frac{\bar{y} - \underline{w}}{2\alpha\sigma_2^2} \quad (3.15)$$

Wages associated with these hiring decisions are :

$$w_1^{MW} = w_1^* = e \frac{\bar{y} - f}{2(e + \alpha\sigma_1^2)} + f \quad (3.16)$$

¹¹Setting other levels of minimum wage would be trivial and not have better results in terms of wages and hiring.

¹²See the appendix for more detailed calculations.

$$w_2^{MW} = \underline{w} \quad (3.17)$$

Effects of Minimum wage policy

Wage effects : Implementation of the minimum wage had no impact on the wages of majority workers but resulted in an increase in minority wages.

Hiring effects : As for equal pay policy, the minimum wage had an impact on minority employment, even though it targeted wages. The policy leads to an increase in minority employment. In the case of majority workers, the minimum wage had no effect.

3.4.3 Interpretation

Implementation of the equal pay policy does not fix the value of the wage the firm has to pay. The only constraint for a firm in implementing wage equality is to give an equal wage to all workers irrespective of their group. There is no obligation for the firm to keep wages at the majority wage level of the baseline prior to the implementation of the policy. The optimal situation for the firm is to set both wages for both groups at an intermediate level. When a policymaker chooses to implement an equal pay policy, it forces the price of labour to change, thereby completely deviating from the reality of the market. But from the firm's point of view, labour demands remain the same. Nothing in the decision of the policymaker directly affects labour demands. Therefore, the effects on the two groups of workers are the following :

- Minority workers : On the one hand, the willingness of the firm to hire minority workers decreases because the price of their labour has risen. On the other hand, this increase causes more participation of minority workers in the labour market. These two, simultaneous effects create unemployment among minority workers.

- Majority workers : On the one hand, the willingness of the firm to hire majority workers increases because of the decrease in the price of their labour. On the other hand, this decrease causes lower participation of majority workers in the labour market. These two, simultaneous effects cause a shortage of majority workers.

Because of the implementation of an equal pay policy, the labour market becomes unbalanced. Unemployment among minority workers and a shortage of majority workers leads to a decrease in employment for both groups and therefore total employment decreases. It causes a reduction of the total production of the firm.

The minimum wage artificially increases minority wages with no impact on majority workers. In fact, through this policy, the policymaker changes the marginal cost of the firm to a constant marginal cost. For minority workers, the effects of an equal pay policy and a minimum wage policy are very similar in terms of wage but opposite in terms of hiring. The crucial difference with the implementation of the minimum wage is that the policymaker sets the wage of minority workers instead of constraining the whole labour market with an equal pay policy. Therefore, the policymaker keeps more control and flexibility in implementing a policy. However, minimum wage does not imply wage equality since majority workers could keep a higher wage if the policymaker decides to set the minority wage at another (e.g. lower) level.

3.4.4 Discussion : Advantages and Drawbacks of Public Policies Targeting Wages to Reduced Discrimination

Following our theoretical analysis, public policies that focus on wages can help reduce or eliminate the pay gap between groups. However, this type of action appears to create unwanted effects on hiring and in turn employment levels. Policies targeting wages do not change the return on the labour for the firm, even if wage levels increase because of these policies. Therefore, the firm faces the constraint of increasing the

wage of the minority group but a direct effect is to penalize minority employment. This theoretical model corroborates Cornell and Welch (1996) who suggested that minority employment could be affected by an equal pay policy and empirical results of Neumark and Stock (2006) based on state sex discrimination laws which target discrimination in pay only (equal pay). Our model also indicates that a misdirected policy can have negative effects on both the wages and the hiring of workers in the majority group. Consequently, public policies that address wages appear questionable in the sense that their implementation could have many unwanted effects.

3.5 Public Policies that Address Hiring to Reduce Discrimination

3.5.1 Quotas

A quota system is a classic means governments in the most industrialized countries use to reduce discrimination and occupational segregation. The firm faces the constraint of having at least a fixed proportion of minority workers on the payroll. In this section, we present a strict quota which prescribes that the firm must have minority and majority groups in the same proportion : $n_1 = n_2 = n$.¹³ We conclude that a quota causes the convergence of hiring values and wage values in the majority and minority groups.

Equilibrium Let n be the number of workers in each group. The maximization problem becomes :

$$\max_n 2n(\bar{y} - f - en) - \alpha n^2 \sum_{j=1}^2 \sigma_j^2. \quad (3.18)$$

¹³We could also easily apply this model to quotas with less strict proportions prescribed ($n_2 \geq \theta n_1$); the results and their interpretation would not change much.

Optimal hiring decisions are :¹⁴

$$n'' = \frac{\bar{y} - f}{2e + \alpha \sum_{j=1}^2 \sigma_j^2} \quad (3.19)$$

Wages associated with these hiring decisions are :

$$w_1 = w_2 = w'' = e \frac{\bar{y} - f}{2e + \alpha \sum_{j=1}^2 \sigma_j^2} + f \quad (3.20)$$

Effects of the Quota Policy

Effect on Wages : The quota policy seems to have an unexpected effect – equal pay! The single wage ends up with a value between the baseline wages. If the quota is less strict than hiring equality but is still a constraint, the pay gap is reduced. Whatever the case, a quota policy results in the convergence of minority and majority group wages.

Effects on Hiring : The policy in our model imposes strict equality of hiring in the two groups. The result is that the wages of the two groups converge to a unique intermediate value which is located between the original hiring values in the baseline model : $n_2^* \leq n'' \leq n_1^*$. If the quota is less strict than hiring equality but is still a constraint, the result is a hiring convergence compared to the baseline values. The proportion of minority workers would be the minimum prescribed by the policy.

3.5.2 Subsidy per Minority Group Worker

This section examines the effect of a subsidy given by the government to the firm for each minority worker employed. The goal of this type of government policy is to stimulate the hiring of minority workers through a direct transfer of funds. The policy we present in this section is related to the idea of differential taxation introduced by

¹⁴See the appendix for more detailed calculations.

Alberto Alesina and Andrea Ichino with their article "Why women should pay less tax" in the Financial Times of April 18, 2007. They suggest reducing income taxes for women and increasing, to a lesser degree, income taxes for men. Their goal is to stimulate the participation rate of women in the labour market. However, this is not our goal, though we wish to maintain the notion of government intervention based on gender. We focus on the firm's hiring behaviour and how minority workers can be made more attractive to the firm. Our subsidy is in line with the idea of governments' and policymakers' heterogeneous treatment of various groups to foster minority employment. In the remainder of this paper, this subsidy policy will be called the " τ policy".

Equilibrium In order to verify the effectiveness of the τ policy, we add the compensation transfer τ to the profit function. This yields the following maximization program :

$$\max_{n_1, n_2} n_1 (\bar{y} - f - en_1) + n_2 (\bar{y} - f + \tau - en_2) - \alpha \sum_{j=1}^2 n_j^2 \sigma_j^2. \quad (3.21)$$

Optimal hiring decisions are :¹⁵

$$n_1^\tau = n_1^* = \frac{\bar{y} - f}{2(e + \alpha\sigma_1^2)}, \quad (3.22)$$

$$n_2^\tau = \frac{\bar{y} - f + \tau}{2(e + \alpha\sigma_2^2)}. \quad (3.23)$$

Wages associated with these hiring decisions are :

$$w_1^\tau = w_1^* = e \frac{\bar{y} - f}{2(e + \alpha\sigma_1^2)} + f, \quad (3.24)$$

$$w_2^\tau = e \frac{\bar{y} - f + \tau}{2(e + \alpha\sigma_2^2)} + f. \quad (3.25)$$

¹⁵See the appendix for more detailed calculations.

Is there a value of the subsidy τ^ which can eliminate wage discrimination and occupational segregation in the labour market?* There is indeed a value τ^* which can eliminate wage discrimination and segregation in the labour market :¹⁶

$$\tau^* = \frac{\alpha (\sigma_2^2 - \sigma_1^2)}{e + \alpha \sigma_1^2} (\bar{y} - f) . \quad (3.26)$$

Effects of a τ Policy

Effect on Wages : The τ policy seems to have no wage consequence on majority workers but increases wage of minority workers. If the subsidy is well calibrated (at τ^*), equal pay is the result of this policy. The value of the wage is equal to the baseline wage of majority workers. The subsidy makes it possible to increase the minority wage to the level of that of the majority wage. No other policy analyzed in this paper makes this possible.

Employment Consequences The τ policy increases minority hiring but has no impact on majority employment. If the subsidy is well calibrated (at τ^*), the minority employment level matches the majority employment baseline level. No other policy analyzed in this paper makes this possible.

Social analysis of this policy It is incumbent to examine the social cost of this policy because it imposes a monetary cost on the government. We must define a new parameter for the labour market. Therefore we introduce an external option $\underline{U}$ for workers which corresponds to the government's unemployment insurance payment. We normalize $\underline{U}$ to 1 without loss of generality.¹⁷

Cost to the Government of a Subsidy Policy

¹⁶See the appendix for more detailed calculations.

¹⁷We assume that workers are always more inclined to work than to remain unemployed.

- The cost of this policy is :

$$n_2^{\tau} \tau^* = \frac{\alpha (\bar{y} - f)^2 (\sigma_2^2 - \sigma_1^2)}{2 (e + \alpha \sigma_1^2)^2} \quad (3.27)$$

The τ policy becomes very expensive for the government in terms of a larger value of the subsidy if the firm evaluates minority workers as much more risky than majority workers. In contrast, the policy has a very low cost for the government if the firm evaluates minority workers as not presenting much risk.

- Gain in the form of a decrease in unemployment payments :

$$n_2^{\tau*} - n_2^* = \frac{\alpha (\bar{y} - f) (\sigma_2^2 - \sigma_1^2)}{2 (e + \alpha \sigma_1^2) (e + \alpha \sigma_2^2)}. \quad (3.28)$$

Then the total variation of government expenditure is :

$$\Delta G = \frac{\alpha (\bar{y} - f) (\sigma_2^2 - \sigma_1^2) [(e + \alpha \sigma_1^2) - (\bar{y} - f) (e + \alpha \sigma_2^2)]}{2 (e + \alpha \sigma_1^2)^2 (e + \alpha \sigma_2^2)} \quad (3.29)$$

There is no clear conclusion indicated by the variation in the cost to the government. For a low productivity industry, the difference is positive and implies that the τ policy reduces the cost. Conversely, in a high productivity industry, the cost to the government increases.

Firms and Workers This policy helps eradicate discriminatory phenomena. There is no impact on majority workers but the conditions of minority workers improve because both wages and hiring increase. The welfare of the firm increases because it can produce more with no additional cost (the subsidy pays the additional costs). Both workers and the firm show positive returns following implementation of the τ policy.

Social Welfare The τ policy could be socially beneficial, especially in a low productivity industry. Uncertainty remains, however, in terms of the net benefit for the

government. In the case of a low productivity industry, the government gains with the granting of the subsidy because the decrease in unemployment payments could be greater than the total value of the subsidies. In the case of a high productivity industry, the total value of the subsidies is higher than the decrease in unemployment compensation. We cannot make conclusions about the direction of social welfare in this case. Therefore, to determine the variation in the value of social welfare :

$$\begin{aligned}\Delta S &= \Delta W + \Delta F + \Delta G \\ &= >0 + >0 + ?\end{aligned}$$

The determination rule in the model is :

$$\left\{ \begin{array}{l} \text{If } \Delta G > 0 \\ \text{or If } \Delta G = 0 \\ \text{or If } \left\{ \begin{array}{l} \Delta G < 0 \\ \text{and } |\Delta G| \leq \Delta W + \Delta F \end{array} \right\} \end{array} \right\} \Rightarrow \text{Socially Beneficial}$$

$$\text{If } \left\{ \begin{array}{l} \Delta G < 0 \\ \text{and } |\Delta G| > \Delta W + \Delta F \end{array} \right\} \Rightarrow \text{Not Socially Beneficial}$$

Discussion : Implementing a subsidy policy We show that this policy could be socially beneficial with some conditions. Implementation is quite easy because it is simply a matter of money being sent from the government to firms. Another way of implementing this policy would be to reduce taxation on minority employment. The main difficulty is to evaluate the amount of the subsidy. The dollar value depends on belief differentials. It seems it would be difficult for the government to establish the exact value.

3.5.3 Interpretation

Implementation of the quota changes the labour value for the firm. The firm cannot continue to hire workers on a one-by-one basis ; it has to hire workers two at a time (one from each group). In other words, if the firm wants a majority worker, it also

has to hire a minority worker. The firm's demand is then affected, and both baseline demands converge to two combined and intermediate labour demands. The effect on wages of the quota is expressed through the labour supply. On the one hand, the firm has to stimulate the participation of minority workers in the labour market to fulfill its need for workers. The only way is to increase the minority wage to hire more minority workers. On the other hand, after n'' the firm does not want more majority workers because hiring two workers becomes too costly. Furthermore, because $n_1^* > n''$, the firm does not need as much participation of majority workers as it did in the baseline model. Therefore the majority wage decreases to the same level as the minority one. Our findings on the effects of a quota policy closely match those of Welch (1976). The main difference is that equal pay is the result of our model, whereas in his it is an assumption.¹⁸ Our model also rounds out the findings of Welch (1976) by illustrating the mechanism of the redistribution of income. In fact, we can state that the policy forces the firm to uniformly allocate risks in terms of workers' wage. Consequently, majority workers become responsible for a part of the firm's beliefs about minority workers. The effect on total hiring and on total production depends on the values of σ_1^2 and σ_2^2 . The effects are not always similar.

Implementation of the τ policy changes the value of minority workers for the firm because the government gives a dollar amount for each minority worker hired. Minority workers appear cheaper than they really are. Therefore, the labour demand of the firm for minority workers increases. If the government decides to give τ^* , the labour demands for minority and majority workers merge. Then minority and majority workers are viewed in exactly the same way by the firm. Therefore, no discriminatory phenomena occur with τ^* . It is important to note that the philosophy of this policy is very different than that of the other policies we previously examined here. The other policies act as a constraint on the firm to reduce discrimination. The τ policy is

¹⁸Welch (1976) assumes that firms must pay the same wage to all workers who have the same job title. He finds that quotas redistribute income from majority to minority workers.

different in the sense that the policymaker does not impose a constraint on the firm ; the idea is to provide an incentive for the firm to change its hiring behaviour. The limitation of this policy could be the social cost because the government has to pay the subsidy τ^* and funding needs are created.¹⁹

Both quota and subsidy policies directly impact the labour demand of the firm and change the value of workers for the firm. With these policies, the government has two different tools : one involving a constraint (quota) and the other involving an incentive (subsidy). They have the same effects when we only focus on discriminatory phenomena, i.e. reducing or eliminating occupational segregation and wage discrimination. However, when the focus is also on wage and hiring values, the subsidy allows for more flexibility and has a less negative effect on majority workers. In fact, the subsidy allows the government to increase the labour demand for minority workers while the quota results in the convergence of the labour demand for both groups. The subsidy gives more flexibility to the government to motivate the firm to employ more minority workers and pay them more, with fewer disadvantages for majority workers.

3.5.4 Discussion : Advantages and Disadvantages of Public Policies that Target Hiring Practices

The advantages of public policies addressing hiring behaviour are clear – they effectively act on both of the front lines of discrimination (occupational segregation and wage discrimination). However, depending on the policy, they have various drawbacks such as the cost of a subsidy, or the decrease in the wage and hiring of majority workers resulting from a quota. However, as our model shows, our suggested incentive policy (minority work subsidy) leads to better results compared to policies that impose constraints (equal pay, quota and minimum wage). Indeed, moving from constraint type policies to incentive policies probably leads to better results because

¹⁹We chose not to add a tax to finance the subsidy because of the negative effect it would have on employment.

the firm is incorporated in the solution. Being a major player in the labour market, the firm should not be considered an enemy or problem by policymakers.

3.6 Should a Public Policy Target Wages or Hiring?

3.6.1 Equal Pay or Quota?

We devote this next section to comparing these two policies, because they are commonly used by governments to counter discrimination. The key difference between them is that a quota changes the workers value for the firm and equal pay causes an unbalanced labour market. A quota policy is more effective in terms of anti-discrimination since it has effects on both wage discrimination and occupational segregation, either reducing or eliminating them. However, in the interests of precision, we compare hiring and wage values under both policies.²⁰ Though majority workers are penalized by both types of policy, equal pay penalizes the majority group less than a quota policy since hiring and wages increase for this group.²¹ For the minority group, neither an equal pay or quota policy has clear benefits all round. Wages are higher with an equal pay policy but a quota policy results in more hiring of minority workers. For minority workers, the quota policy seems fairer, but an equal pay policy provides a higher wage for existing employees. For both groups, though an initial examination suggests the quota system is fairer, more in-depth analyses in our models seem to show that an equal policy results in higher wages. In other words, more people are employed through a quota policy, but wages are higher under an equal pay policy.

²⁰See the appendix for more detailed calculations.

²¹Our finding with regards to majority workers provides some support for “Myth #6” described by Fryer and Loury (2005) “Many whites are directly affected by affirmative action policies designed to increase representation of minorities” in that our model shows there could indeed be an effect on majority workers. Fryer and Loury assert the opposite, based on college admissions.

3.6.2 Who Benefits from an Anti-Discrimination Policy ?

Equal pay and quota policies pose potential problems for policymakers in terms of incentives and who really benefits from them. Beneficiaries of each of these policies do not comprise the same segment of the workforce. Certain groups may question as to whether in the long run the policy is good for them or not. Is the policy good for all, or just a select few ? This can pit one social group against another. In such a context, groups may turn to lobbying. Consequently, the government could be influenced to favour a particular group in the labour force under the guise of fighting discrimination because of close relations with them, ideological proximity or lobbying. A quota policy favours unemployed minority workers while an equal pay policy favours majority workers and minority workers who are already employed. The choice between these policies involves inter- and intra-group political issues. Moreover, different lobbyists could negotiate for a targeted policy in favour of the group they represent.

We therefore consider that it is important to find anti-discrimination measures which do not place the government in a tug-of-war position between different groups. An effective policy must not favour one group over another. The social welfare of all must be the ultimate goal, even if not fully attainable.

3.6.3 General Implications

The key difference between the two types of policy is the impact on the workers' value for the firm. Policies on wages such as minimum wage and equal pay change only the market price of workers but do not change the firm's way of thinking about workers. In addition, wage policies create unemployment among minority workers and shortages of majority workers. Policies on hiring behaviour, such as quotas and subsidies, change the way the firm thinks about workers and therefore their whole approach to hiring. Moreover, our model shows that instead of constraining the firm, the subsidy policy provide an incentive for firms to reduce discrimination, whereas

any type of wage policy cannot do this. However, incentive-oriented policies create a monetary cost that the government has to cover. It seems to us, then, that policies that target hiring behaviours, namely quotas and subsidies, provide more effective anti-discriminatory policies and fairer results, even given their drawbacks.

3.7 Public Policies Addressing the Labour Market Structure

In this study, we have focused so far on laws designed to correct discriminatory phenomena in the labour market. We based our analysis on a monopsony labour market. The next section examines the effects of various types of labour market structure on discrimination. The goal is to determine if policies that promote competition in the labour market could decrease discrimination.²² In addition, in our market structure model, we introduce the strategic behaviour of the firm in hiring decision-making.

3.7.1 Oligopsony

There are $K > 1$ symmetrical firms competing in the labour market. We address the oligopsony problem by using a reverse Cournot competition with symmetrical firms. The goods and services market stays perfectly competitive. The inverse labour supply in the oligopsony market structure becomes :

$$w_{kj} = e \left(\sum_{k=1}^K n_{kj} \right) + f. \quad (3.30)$$

The optimal hiring behaviour is determined by the following maximization program :

$$\max_{n_{ij}} \sum_{j=1}^2 n_{ij} \left[\bar{y} - f - e \left(n_{ij} + \sum_{k \neq i} n_{kj} \right) - \alpha n_{ij} \sigma_j^2 \right]. \quad (3.31)$$

²²For example : creation of productivity hub to group firms in the same industry in the same geographic location (Silicon Valley, etc...), foster the creation of firms in markets with low competition, etc.

Optimal hiring decisions are :²³

$$n_{ij}^o = \frac{\bar{y} - f}{e(K+1) + 2\alpha\sigma_j^2}. \quad (3.32)$$

Wages associated with these hiring decisions are :

$$w_j^o = eK \frac{\bar{y} - f}{e(K+1) + 2\alpha\sigma_j^2} + f. \quad (3.33)$$

With an oligopsony market structure, no major effects on discrimination are observed. The few changes we did observe were on hiring and wage levels. Indeed, discrimination against the minority group still occurs.

Effect on Wages : The oligopsony market structure increases the wage for both groups in comparison with monopsony. Moreover, wage differentials decrease.

Effects on Hiring : The oligopsony market structure increases hiring in comparison with the monopsony. Occupational segregation decreases.

3.7.2 Competitive Labour Market

There are $L > K + 1$ symmetrical firms in a competitive labour market. Inverse labour supply for the competitive environment can be reformulated as :

$$w_{kj} = e \left(\sum_{k=1}^L n_{kj} \right) + f. \quad (3.34)$$

The optimal hiring behaviour is determined by the following maximization program. w_1 and w_2 are set by the competitive labour market.

$$\max_{n_{ij}, w_j} \sum_{j=1}^2 [n_{ij} (\bar{y} - w_j) - \alpha n_{ij}^2 \sigma_j^2]. \quad (3.35)$$

²³See the appendix for more detailed calculations.

Optimal hiring decisions are :²⁴

$$n_{ij}^c = \frac{\bar{y} - f}{eL + 2\alpha\sigma_j^2}. \quad (3.36)$$

Wages associated with these hiring decisions are :

$$w_j^c = \frac{eL}{eL + 2\alpha\sigma_j^2} (\bar{y} - f) + f. \quad (3.37)$$

The effects on wages and hiring in the competitive market were the same as those in the oligopsony market structure.

3.7.3 Impacts of Labour Market Structures

Changing a monopsony market structure to an oligopsony or competitive one decreases the market power of the firm because competition among firms arises in the labour market. This gives market power to workers who are able to earn more for the same work and benefit from greater demand for their services because the labour market has widened. In addition to reducing discrimination, the emergence of workers' market power leads to improved employment conditions, namely higher wages and more hiring for both workers' groups in the labour market.

To verify the reduction of discrimination in an oligopsony structure, we compare the following ratios : $\frac{Kn_{i2}^o - Kn_{i1}^o}{Kn_{i2}^o} = 1 - \frac{e(K+1)+2\alpha\sigma_1^2}{e(K+1)+2\alpha\sigma_2^2}$ and $\frac{n_2^* - n_1^*}{n_2^*} = 1 - \frac{e+\alpha\sigma_1^2}{e+\alpha\sigma_2^2}$ which are hiring gap proportions in oligopsony and monopsony.²⁵ This comparison is valid for both wages and hiring since the equilibrium values are positively correlated. We can conclude that :

$$\frac{n_2^* - n_{i1}^*}{n_2^*} > \frac{Kn_{i2}^o - Kn_{i1}^o}{Kn_{i2}^o}. \quad (3.38)$$

Therefore, wage discrimination and occupational segregation decrease in both an oligopsony and a competitive market structure compared to the baseline monopsony

²⁴See the appendix for more detailed calculations.

²⁵We can similarly prove that a competitive market structure also reduces discrimination.

market structure. Oligopsony and competitive market structures not only have a positive impact on the minority group but also on the majority group. If we compare the oligopsony with the competitive market structure, it is easy to demonstrate that the anti-discrimination effects the competitive are greater. In other words, discrimination is lower in a competitive environment. The more competitive the labour market, the more wages and hiring increase, irrespective of the workers' group. In addition, the more competitive the labour market, the less discrimination occurs. Public policies which foster competition can therefore combat discrimination even if competition is not strong enough to entirely eliminate it. Indeed, wage discrimination and occupational segregation persist whatever the market structure.

3.8 Conclusion

In addition to a theoretical analysis of the effects of public policies and labour market structures on discrimination, this paper raises questions about certain methods employed to combat discrimination. We have shown that the effects on discrimination vary according to whether a policy targets hiring behaviour or wages, whether it puts a constraint on the firm or whether it acts as an incentive to change the firm's behaviour. We have also shown that certain anti-discrimination policies could have political implications if the government chooses a particular one that provides incentives for a certain group because of lobbying or ideological proximity. We considered both the wage and hiring components in our models because it seems to us that their interdependence is crucial in this context. Their interdependence could lead to unwanted effects which policymakers should take into consideration when choosing an optimal policy. Our results show that the potentially negative impacts of certain policies are significant enough to be included in policymakers' decision-making processes. Indeed, all possible effects should be kept in mind when designing a policy that will become law. Given the above, we think that a number of current government policies

do not redress inequality in the labour market and that new solutions, perhaps those we have illustrated in this paper, will be more effective in fighting wage discrimination and occupational segregation.

3.9 Appendix

3.9.1 Monopsony Model

General Form

The inverse labor supply is $w_j = g(n_j)$ with $g'(n_j) \leq 0$. The utility function of profit of the firm is :

$$U[E(\pi(n_j; w_j)); \alpha Var(\pi(n_j; w_j))] \quad (3.39)$$

with $U_E \geq 0$ and $U_V \leq 0$.

The optimal hiring behavior is determined by the following maximisation program :

$$\max_{n_j, w_j} U[E(\pi(n_j; w_j)); \alpha Var(\pi(n_j; w_j))]$$

$$s.t. \left\{ \begin{array}{l} w_j = g(n_j) \\ \pi(n_j; w_j) = \sum_{j=1}^2 [n_j (y_j - w_j)] \quad \nabla j \end{array} \right\}.$$

This yields the first order conditions of the problem :

$$U_E(n_j) [\bar{y} - g(n_j) - g'(n_j) n_j] + 2\alpha n_j \sigma_j^2 U_v(n_j) = 0 \text{ and } w_j = g(n_j).$$

The first order conditions have the same properties as those in the baseline model (reduced forms).

Baseline Model

$$\begin{aligned} & \max_{n_1, n_2} n_1 (\bar{y} - f - en_1) + n_2 (\bar{y} - f - en_2) - \alpha (n_1^2 \sigma_1^2 + n_2^2 \sigma_2^2) \\ & \Leftrightarrow \frac{\partial}{\partial n_1} = 0 \quad \Leftrightarrow \frac{\partial}{\partial n_2} = 0 \\ & \Leftrightarrow \bar{y} - 2en_1 - f - 2\alpha n_1 \sigma_1^2 = 0 \quad \Leftrightarrow \bar{y} - 2en_2 - f - 2\alpha n_2 \sigma_2^2 = 0 \\ & \Leftrightarrow n_1^* = \frac{\bar{y} - f}{2(e + \alpha \sigma_1^2)} \quad \Leftrightarrow n_2^* = \frac{\bar{y} - f}{2(e + \alpha \sigma_2^2)} \\ & \Rightarrow w_1^* = e \frac{\bar{y} - f}{2(e + \alpha \sigma_1^2)} + f \quad \Rightarrow w_2^* = e \frac{\bar{y} - f}{2(e + \alpha \sigma_2^2)} + f \end{aligned}$$

Baseline Model if y_1 and y_2 Are Correlated

$$\begin{aligned}
& \max_{n_1, n_2} n_1 (\bar{y} - f - en_1) + n_2 (\bar{y} - f - en_2) - \alpha (n_1^2 \sigma_1^2 + n_2^2 \sigma_2^2 + 2n_1 n_2 \sigma_{12}) \\
& \Leftrightarrow \frac{\partial -}{\partial n_1} = 0 \qquad \qquad \qquad \Leftrightarrow \frac{\partial -}{\partial n_2} = 0 \\
& \Leftrightarrow \bar{y} - 2en_1 - f - 2\alpha n_1 \sigma_1^2 - 2\alpha n_2 \sigma_{12} = 0 \quad \Leftrightarrow \bar{y} - 2en_2 - f - 2\alpha n_2 \sigma_2^2 - 2\alpha n_1 \sigma_{12} = 0 \\
& \Leftrightarrow n_1 = \frac{\bar{y} - f - 2\alpha n_2 \sigma_{12}}{2(e + \alpha \sigma_1^2)} \qquad \qquad \Leftrightarrow n_2 = \frac{\bar{y} - f - 2\alpha n_1 \sigma_{12}}{2(e + \alpha \sigma_2^2)} \\
& \Leftrightarrow n_1^{**} = \frac{(\bar{y} - f)[e + \alpha \sigma_2^2 - \alpha \sigma_{12}]}{2(e + \alpha \sigma_1^2)(e + \alpha \sigma_2^2) + \alpha \sigma_{12}} \qquad \Leftrightarrow n_2^{**} = \frac{(\bar{y} - f)[e + \alpha \sigma_1^2 - \alpha \sigma_{12}]}{2(e + \alpha \sigma_1^2)(e + \alpha \sigma_2^2) + \alpha \sigma_{12}} \\
& \Leftrightarrow w_1^{**} = e \frac{(\bar{y} - f)[e + \alpha \sigma_2^2 - \alpha \sigma_{12}]}{2(e + \alpha \sigma_1^2)(e + \alpha \sigma_2^2) + \alpha \sigma_{12}} + f \qquad \Leftrightarrow w_2^{**} = e \frac{(\bar{y} - f)[e + \alpha \sigma_1^2 - \alpha \sigma_{12}]}{2(e + \alpha \sigma_1^2)(e + \alpha \sigma_2^2) + \alpha \sigma_{12}} + f
\end{aligned}$$

We therefore obtain the same properties as those of the uncorrelated case.

Equal Pay Model

$$\begin{aligned}
& \max_{n_1, n_2} (n_1 + n_2) (\bar{y} - f - \frac{e}{2} (n_1 + n_2)) - \alpha (n_1^2 \sigma_1^2 + n_2^2 \sigma_2^2) \\
& \Leftrightarrow \frac{\partial -}{\partial n_1} = 0 \qquad \qquad \qquad \Leftrightarrow \frac{\partial -}{\partial n_2} = 0 \\
& \Leftrightarrow \bar{y} - \frac{e}{2} (2n_1 + 2n_2) - f - 2\alpha n_1 \sigma_1^2 = 0 \quad \Leftrightarrow \bar{y} - \frac{e}{2} (2n_1 + 2n_2) - f - 2\alpha n_2 \sigma_2^2 = 0 \\
& \Leftrightarrow n_1 (2\alpha \sigma_1^2 + e) = \bar{y} - f - en_2 \qquad \qquad \Leftrightarrow n_2 (2\alpha \sigma_2^2 + e) = \bar{y} - f - en_1 \\
& \Rightarrow n_1 = \frac{\sigma_2^2 (\bar{y} - f)}{2\alpha \sigma_1^2 \sigma_2^2 + e(\sigma_1^2 + \sigma_2^2)} \qquad \qquad \Rightarrow n_2 = \frac{\sigma_1^2 (\bar{y} - f)}{2\alpha \sigma_1^2 \sigma_2^2 + e(\sigma_1^2 + \sigma_2^2)} \\
& w = \frac{e}{2} \frac{(\sigma_1^2 + \sigma_2^2)(\bar{y} - f)}{2\alpha \sigma_1^2 \sigma_2^2 + e(\sigma_1^2 + \sigma_2^2)} + f
\end{aligned}$$

In verifying the labour supply of majority workers, it appears that there is an insufficient number of workers available to work at this wage. The number of workers from the majority group who would accept to work at this wage is :

$$n_1 = \frac{1}{2} \frac{(\sigma_1^2 + \sigma_2^2)(\bar{y} - f)}{2\alpha \sigma_1^2 \sigma_2^2 + e(\sigma_1^2 + \sigma_2^2)}$$

Minimum Wage Model

$$\max_{n_1, n_2} n_1 (\bar{y} - w_1) + n_2 (\bar{y} - w_2) - \alpha (n_1^2 \sigma_1^2 + n_2^2 \sigma_2^2).$$

$$s.t. : \left\{ \begin{array}{l} w_1 = \max(\underline{w}; w_1^*) \\ w_2 = \max(\underline{w}; w_2^*) \\ w_j = en_j + f \end{array} \right\}$$

First, we derive solutions without the first two constraints. Then, we verify whether the derived values fit with the constraints.

$$\max_{n_1, n_2} n_1 (\bar{y} - f - en_1) + n_2 (\bar{y} - f - en_2) - \alpha (n_1^2 \sigma_1^2 + n_2^2 \sigma_2^2)$$

$$\begin{aligned}
&\Leftrightarrow \frac{\partial -}{\partial n_1} = 0 & \Leftrightarrow \frac{\partial -}{\partial n_2} = 0 \\
&\Leftrightarrow \bar{y} - 2en_1 - f - 2\alpha n_1 \sigma_1^2 = 0 & \Leftrightarrow \bar{y} - 2en_2 - f - 2\alpha n_2 \sigma_2^2 = 0 \\
&\Leftrightarrow n_1^{MW} = \frac{\bar{y}-f}{2(e+\alpha\sigma_1^2)} & \Leftrightarrow n_2^{MW} = \frac{\bar{y}-f}{2(e+\alpha\sigma_2^2)} \\
&\Rightarrow w_1^{MW} = e \frac{\bar{y}-f}{2(e+\alpha\sigma_1^2)} + f > \bar{w} & \Rightarrow w_2^{MW} = e \frac{\bar{y}-f}{2(e+\alpha\sigma_2^2)} + f < \bar{w}
\end{aligned}$$

But w_2^{MW} must be $\geq \bar{w}$. Therefore, $w_2^{MW} = \bar{w}$ and $n_2^{MW} = \frac{\bar{y}-\bar{w}}{2\alpha\sigma_2^2}$.

Quota Model

$$\begin{aligned}
&\max_n 2n(\bar{y} - f - en) - \alpha n^2(\sigma_1^2 + \sigma_2^2) \\
&\Leftrightarrow \frac{\partial -}{\partial n} = 0 \\
&\Leftrightarrow 2(\bar{y} - f - 2en) - 2\alpha n(\sigma_1^2 + \sigma_2^2) = 0 \\
&\Leftrightarrow n'' = \frac{\bar{y}-f}{2e+\alpha(\sigma_1^2+\sigma_2^2)} \\
&\Rightarrow w'' = e \frac{\bar{y}-f}{2e+\alpha(\sigma_1^2+\sigma_2^2)} + f
\end{aligned}$$

Minority Group Subsidy Model

$$\begin{aligned}
&\max_{n_1, n_2} n_1(\bar{y} - f - en_1) + n_2(\bar{y} - f - en_2 + \tau) - \alpha(n_1^2\sigma_1^2 + n_2^2\sigma_2^2) \\
&\Leftrightarrow \frac{\partial -}{\partial n_1} = 0 & \Leftrightarrow \frac{\partial -}{\partial n_2} = 0 \\
&\Leftrightarrow \bar{y} - 2en_1 - f - 2\alpha n_1 \sigma_1^2 = 0 & \Leftrightarrow \bar{y} - 2en_2 - f - 2\alpha n_2 \sigma_2^2 + \tau = 0 \\
&\Leftrightarrow n_1^\tau = \frac{\bar{y}-f}{2(e+\alpha\sigma_1^2)} & \Leftrightarrow n_2^\tau = \frac{\bar{y}-f+\tau}{2(e+\alpha\sigma_2^2)} \\
&\Rightarrow w_1^\tau = e \frac{\bar{y}-f}{2(e+\alpha\sigma_1^2)} + f & \Rightarrow w_2^\tau = e \frac{\bar{y}-f+\tau}{2(e+\alpha\sigma_2^2)} + f
\end{aligned}$$

Value of τ^*

We want $n_1^\tau = n_2^\tau$.

$$\begin{aligned}
&\Leftrightarrow \frac{\bar{y}-f}{2(e+\alpha\sigma_1^2)} = \frac{\bar{y}-f+\tau}{2(e+\alpha\sigma_2^2)} \\
&\Leftrightarrow \tau = \frac{\bar{y}-f}{e+\alpha\sigma_1^2} (e + \alpha\sigma_2^2) - \bar{y} + f \\
&\Leftrightarrow \tau = \frac{\bar{y}-f}{e+\alpha\sigma_1^2} (e + \alpha\sigma_2^2) - \frac{\bar{y}-f}{e+\alpha\sigma_1^2} (e + \alpha\sigma_1^2) \\
&\Leftrightarrow \tau = \frac{\bar{y}-f}{e+\alpha\sigma_1^2} (e + \alpha\sigma_2^2 - e - \alpha\sigma_1^2) \\
&\Leftrightarrow \tau^* = \frac{\alpha(\sigma_2^2 - \sigma_1^2)}{e+\alpha\sigma_1^2} (\bar{y} - f)
\end{aligned}$$

Then, it is easy to verify that τ^* is also compatible with equality of wages.

Equal Pay Policy Vs. Quota Policy

$$n'' = \frac{\bar{y}-f}{2e+\alpha(\sigma_1^2+\sigma_2^2)} = \frac{(\sigma_1^2+\sigma_2^2)(\bar{y}-f)}{2e(\sigma_1^2+\sigma_2^2)+\alpha(\sigma_1^2+\sigma_2^2)^2}$$

$$n_1' = \frac{1}{2} \frac{(\sigma_1^2+\sigma_2^2)(\bar{y}-f)}{2\alpha\sigma_1^2\sigma_2^2+e(\sigma_1^2+\sigma_2^2)} = \frac{(\sigma_1^2+\sigma_2^2)(\bar{y}-f)}{4\alpha\sigma_1^2\sigma_2^2+2e(\sigma_1^2+\sigma_2^2)}$$

Since the numerators are the identical, the denominators will be compared in order to ascertain whether n'' or n_1' is greater.

$$\begin{aligned} & 2e(\sigma_1^2 + \sigma_2^2) + \alpha(\sigma_1^2 + \sigma_2^2)^2 - 4\alpha\sigma_1^2\sigma_2^2 - 2e(\sigma_1^2 + \sigma_2^2) \\ &= \alpha(\sigma_1^2 + \sigma_2^2)^2 - 4\alpha\sigma_1^2\sigma_2^2 \\ &= \alpha(\sigma_1^2 - \sigma_2^2)^2 \geq 0 \\ &\implies n_1' \geq n'' \end{aligned}$$

The proof is nearly the same for $w' \geq w''$

$$n'' = \frac{\bar{y}-f}{2e+\alpha(\sigma_1^2+\sigma_2^2)} = \frac{\sigma_1^2(\bar{y}-f)}{2e\sigma_1^2+\alpha\sigma_1^2(\sigma_1^2+\sigma_2^2)}$$

$$n_2' = \frac{\sigma_1^2(\bar{y}-f)}{2\alpha\sigma_1^2\sigma_2^2+e(\sigma_1^2+\sigma_2^2)}$$

Since the numerators are the same, the denominators will be compared in order to ascertain whether n'' or n_2' is greater

$$\begin{aligned} & 2e\sigma_1^2 + \alpha\sigma_1^2(\sigma_1^2 + \sigma_2^2) - 2\alpha\sigma_1^2\sigma_2^2 - e(\sigma_1^2 + \sigma_2^2) \\ &= e(2\sigma_1^2 - \sigma_1^2 - \sigma_2^2) + \alpha(\sigma_1^4 + \sigma_2^2 - 2\sigma_1^2\sigma_2^2) \end{aligned}$$

The first part is negative because $\sigma_1^2 < \sigma_2^2$

The second part is negative too because $\sigma_1^4 < \sigma_1^2\sigma_2^2$ and $\sigma_1^2 < \sigma_1^2\sigma_2^2$

$$\implies n'' \geq n_2'$$

3.9.2 Oligopsony Model with Symmetrical Firms

$$\begin{aligned} & \max_{n_{i1}, n_{i2}} n_{i1} \left[\bar{y} - f - e \left(n_{i1} + \sum_{k \neq j} n_{k1} \right) \right] + n_{i2} \left[\bar{y} - f - e \left(n_{i2} + \sum_{k \neq j} n_{k2} \right) \right] - \alpha(n_{i1}^2\sigma_1^2 + n_{i2}^2\sigma_2^2) \\ & \Leftrightarrow \frac{\partial}{\partial n_{i1}} = 0 \quad \Leftrightarrow \frac{\partial}{\partial n_{i2}} = 0 \\ & \Leftrightarrow \bar{y} - 2en_{i1} - f - 2\alpha n_{i1}\sigma_1^2 - e \sum_{k \neq j} n_{k1} = 0 \quad \Leftrightarrow \bar{y} - 2en_{i2} - f - 2\alpha n_{i2}\sigma_2^2 - e \sum_{k \neq j} n_{k2} = 0 \\ & \Leftrightarrow n_{i1}^o = \frac{\bar{y}-f}{e(K+1)+2\alpha\sigma_1^2} \quad \Leftrightarrow n_{i2}^o = \frac{\bar{y}-f}{e(K+1)+2\alpha\sigma_2^2} \\ & \Rightarrow w_1^o = eK \frac{\bar{y}-f}{e(K+1)+2\alpha\sigma_1^2} + f \quad \Rightarrow w_{i2}^o = eK \frac{\bar{y}-f}{e(K+1)+2\alpha\sigma_2^2} + f \end{aligned}$$

3.9.3 Competitive Market Structure Model

$$\begin{aligned}
& \max_{n_{i1}, n_{i2}} n_{i1} (\bar{y} - w_1) + n_{i2} (\bar{y} - w_2) - \alpha (n_{i1}^2 \sigma_1^2 + n_{i2}^2 \sigma_2^2) \\
& \Leftrightarrow \frac{\partial}{\partial n_{i1}} = 0 \quad \Leftrightarrow \frac{\partial}{\partial n_{i2}} = 0 \\
& \Leftrightarrow \bar{y} - w_1 - 2\alpha n_{i1} \sigma_1^2 = 0 \quad \Leftrightarrow \bar{y} - w_2 - 2\alpha n_{i2} \sigma_2^2 = 0 \\
& \Leftrightarrow n_{i1} = \frac{\bar{y} - w_1}{2\alpha \sigma_1^2} \quad \Leftrightarrow n_{i2} = \frac{\bar{y} - w_2}{2\alpha \sigma_2^2}
\end{aligned}$$

In the labour market with symmetrical firms, we have :

$$\begin{aligned}
& \left\{ \begin{array}{l} n_{i1} = \frac{\bar{y} - w_1}{2\alpha \sigma_1^2} \\ w_{i1} = eLn_{i1} + f \end{array} \right\} \quad \left\{ \begin{array}{l} n_{i2} = \frac{\bar{y} - w_2}{2\alpha \sigma_2^2} \\ w_{i2} = eLn_{i2} + f \end{array} \right\} \\
& \Leftrightarrow n_{i1}^c = \frac{\bar{y} - f}{eL + 2\alpha \sigma_1^2} \quad \Leftrightarrow n_{i2}^c = \frac{\bar{y} - f}{eL + 2\alpha \sigma_2^2} \\
& \Rightarrow w_1^c = eL \frac{\bar{y} - f}{eL + 2\alpha \sigma_1^2} + f \quad \Rightarrow w_{i2}^c = eL \frac{\bar{y} - f}{eL + 2\alpha \sigma_2^2} + f
\end{aligned}$$

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Chapitre 4

MODERNITÉ ET PARTICIPATION SUR LE MARCHÉ DU TRAVAIL DES FEMMES : L'EXEMPLE JAPONAIS

4.1 Introduction

Les différences culturelles et les valeurs traditionnelles sont souvent considérées comme de véritables barrières à la participation des femmes au marché du travail. Dans la littérature économique, on traite ces notions à travers l'étude de la décision de participation de femmes, ayant différentes origines, dans un marché du travail qui n'est pas celui de leurs origines ; un exemple est l'étude réalisée par Reimers (1985). Toutefois, la culture et les traditions n'affectent pas de la même façon tous les gens ayant la même origine. Les valeurs ne sont pas distribuées de façon homogène et, en conséquence, on retrouve différents degrés de convictions au sein d'une population. Ce papier étudie donc l'impact de la force des convictions dans les valeurs traditionnelles (par opposition aux valeurs modernes) sur la participation des femmes japonaises au marché du travail.

Les données utilisées dans cette étude peuvent potentiellement apporter des précisions sur la relation entre les valeurs traditionnelles et l'offre de travail des femmes. Mon travail économétrique se base sur une base de données qui offre de nombreuses informations sur des aspects sociaux et psychologiques des répondants. Cela rend possible la création d'une variable mesurant le degré de conviction dans les valeurs traditionnelles pour chaque répondant et donc permet plus de précision pour mesurer la relation entre les valeurs traditionnelles et l'offre de travail des femmes. Cette variable portera le nom d'indice de modernité dans cette étude.¹ Vella (1994) utilise un

¹Un chiffre élevé pour l'indice de modernité représente un répondant qui porte des valeurs plus moderne qu'un répondant ayant un chiffre plus bas représentant des valeurs plus traditionnelles.

indice similaire, réalisé à partir d'une base de données australienne, afin d'examiner le lien entre la perception du rôle des femmes au sein du foyer et les comportements des femmes sur le marché du travail. Il montre un effet non-négligeable de cette perception sur l'investissement en capital humain et l'offre de travail. Dans son papier, Vella (1994), détecte des sources d'endogénéité mais ne contrôle pas pour celles-ci. Contrôler pour l'endogénéité et donc s'assurer de la pertinence des résultats est un des objectifs dans mon étude. Par ce faire, une estimation de la participation au marché du travail en deux étapes est réalisée afin de prendre en compte les sources d'endogénéité.

Ici, les sources d'endogénéité viennent premièrement de la simultanéité entre la décision de participation et l'évolution des valeurs et deuxièmement de l'existence potentielle de facteurs non-observables qui affecteraient à la fois la décision de participation et la probabilité d'avoir des valeurs modernes ou traditionnelles. Afin de contrôler pour l'endogénéité de l'indice de modernité, une estimation de la participation sur le marché du travail en deux étapes avec variables instrumentales a été réalisée. Une estimation suivant la méthode des Doubles Moindres Carrés est effectuée pour éviter le problème de la régression interdite ("forbidden regression"), telle que recommandée par Angrist et Krueger (2001).

Rester à la maison et prendre la charge du travail domestique ou participer au marché du travail peut être vu comme une décision se basant uniquement sur des critères économiques. Une simple analyse coût-bénéfice peut supporter cet énoncé. Toutefois, se restreindre aux critères économiques me semble inapproprié dans ce cas. En ignorant l'aspect psychologique de cette décision, c'est l'un des principaux déterminants qui serait potentiellement oublié.

Traditionnellement, la charge de travail domestique est la responsabilité de la femme japonaise ; cela influence donc sa décision de participation au marché du travail. Les aspects économiques qui entrent en jeu dans la décision de participation sont facilement perceptible, mais ils ne sont les seuls aspects à prendre en compte lorsque

l'on cherche à comprendre les déterminants de la participation au marché du travail. La psychologie, au travers des valeurs de la décisionnaire, joue aussi un rôle important qui doit être pris en compte. En effet, la manière de considérer son rôle dans le foyer est un aspect psychologique qui affecte la décision de participation. C'est pourquoi, inclure l'indice de modernité permet de faire la distinction entre le raisonnement économique et le facteur psychologique.

Reimers (1985) procède à l'estimation de la participation au marché du travail pour des femmes de différentes origines à partir de microdonnées d'enquête. Les différences culturelles sont insérées dans l'estimation du fait de la présence de variables dichotomiques représentant le groupe ethnique des répondantes.² Elle conclut que la totalité de la différence entre le taux de participation au marché du travail des femmes blanches nées aux Etats-Unis et celui des femmes asiatiques nées aux Etats-Unis (dont la moitié est d'origine japonaise) est directement due aux différences culturelles et cela même si ces femmes présentent des caractéristiques similaires. Elle estime que les différences culturelles dans ce cas expliquent l'écart de 12 à 13 points dans les taux de participation. Toutefois, ces résultats ne prennent pas en compte l'influence de la culture traditionnelle au niveau individuel. On peut donc interpréter ces résultats comme étant l'effet moyen de la culture sur les femmes asiatiques résidant aux Etats-Unis ; les différences de convictions entre les répondantes appartenant au même groupe ethnique n'y étant pas mesurables.

Pour ma part, j'introduis différents degrés de conviction dans les valeurs grâce à la présence de l'indice de modernité dans l'estimation. Mes résultats montrent que le degré de conviction des femmes japonaises explique jusqu'à 22 points d'écart entre les taux de participation de celles-ci. Toutefois, après avoir contrôlé pour l'endogénéité, la significativité de l'indice de modernité est remise en cause.

²Des variables, mesurant le niveau de connaissance de la langue anglaise, mesurant si l'anglais est la langue maternelle et indiquant la date d'arrivée sur le territoire américain si la répondante est née hors des Etats-Unis, sont aussi introduite dans la régression afin des contrôler pour les aspects pouvant affecter la participation qui sont liés à l'origine mais qui ne sont pas l'origine.

Mon intérêt pour le Japon n'est pas fortuit. En effet, le Japon est un pays développé dans lequel modernité et traditions sont encore en compétition au sein de la société civile. On y trouve un large éventail de niveaux de convictions. Des plus traditionnelles au plus modernes. Cette large représentation des convictions permet donc une mesure plus précise de l'effet des valeurs modernes et traditionnelles sur les décisions liées au marché du travail. Par ailleurs, le taux de participation des femmes japonaises sur le marché du travail suit une évolution inhabituelle en comparaison des autres pays développés. En effet, ce taux de participation a été quasiment stable au Japon dans les 25 dernières années, alors qu'on observe une augmentation très significative dans les autres pays. Les données du recensement de la population japonaise de 2007 montrent que le taux de participation des japonaises était de 48,5% en 1982 alors qu'il était de 48.8% en 2007.

La participation sur le marché du travail des japonaises a déjà été estimée à plusieurs reprises. Les études réalisées par Morgan et Hirosima (1983), Yamada, Yamada et Chaloupka (1987), Hill (1989), Ogawa et Ermisch (1996), Nagase (1997) et Sasaki (2002) sont des exemples pertinents. Ces études ont la particularité de s'intéresser à la co-résidence avec les parents ou les beaux-parents comme des déterminants de la participation. L'intérêt particulier pour la co-résidence vient de la composition traditionnelle du foyer japonais au sein duquel les parents vivent avec le fils aîné qui est leur unique héritier.³ La co-résidence est donc une réalité pour beaucoup de familles japonaises. Ces études arrivent à la conclusion que la co-résidence favorise la participation des femmes sur le marché du travail puisqu'une partie de la charge domestique est assurée par les parents ou les beaux-parents. La principale contribution de Sasaki (2002) est de considérer l'endogénéité de la co-résidence. Dans son étude, Il met en avant deux sources potentielles d'endogénéité : la codétermination de la structure

³Dans le cas où les parents n'ont que des filles, la famille adoptera un jeune homme et le mariera à l'une des filles. Ce jeune homme prendra le nom de famille de sa femme et sera considéré comme l'héritier.

familiale et le fait que le degré des convictions dans les valeurs traditionnels n'est pas observable.⁴ Afin de contrôler pour l'endogénéité de la co-résidence, il procède à une estimation en deux étapes s'appliquant aux modèles discrets avec variables endogènes. Dans la première étape, il prédit la probabilité non-linéaire de co-résidence grâce à un model logit. Ensuite il utilise cette probabilité non-linéaire comme instrument pour déterminer la probabilité linéaire de co-résidence. Puis, la seconde étape consiste à l'estimation de la participation sur le marché du travail en utilisant la probabilité linéaire de co-résidence comme instrument. Sasaki (2002) arrive aux mêmes conclusions que les études ne prenant pas en compte les sources d'endogénéité. Les coefficients estimés avec le traitement pour l'endogénéité y sont très proches de ceux estimés sans ce traitement.

Aux vus de cela, une question ressort à propos des valeurs traditionnelles. D'un côté, les valeurs traditionnelles semblent décourager la participation des femmes sur le marché du travail du fait de la charge de travail au sein du foyer, mais d'un autre côté, ces mêmes valeurs semblent l'encourager au travers de son effet positif sur la co-résidence. L'effet net n'est donc pas sans ambiguïté.

4.2 Données

Les données servant à l'analyse proviennent l'enquête générale sociale japonaise (Japanese General Social Survey) de 2003.⁵ Les données de cette enquête ont été collectées entre le 20 octobre 2003 et le 30 novembre 2003 auprès d'hommes et de

⁴Les femmes qui voudraient avoir une activité professionnelle seront plus enclines à vouloir résider avec leurs parents ou leurs beaux-parents. Cela leur permet de partager les tâches ménagères pour avoir plus de temps afin de travailler à l'extérieur du lieu de résidence. Ne pas prendre en compte cet effet conduit à une surestimation de l'effet de co-résidence sur la participation. Par ailleurs, la tradition japonaise voulant que la femme reste à la maison, une femme ayant des valeurs traditionnelles fortes sera moins encline à travailler à l'extérieur du lieu de résidence. Ne pas prendre en compte cet effet conduit à une sous-estimation de l'effet de co-résidence sur la participation.

⁵Tanioka, Ichiro, Noriko Iwai, Michio Nitta, and Hiroki Sato. Japanese General Social Survey (JGSS), 2003 [Computer file]. ICPSR04242-v1. Ann Arbor, MI : Inter-university Consortium for Political and Social Research [distributor], 2005-09-30. doi :10.3886/ICPSR04242

femmes âgés de 20 à 89 ans vivant au Japon et ayant le droit de vote. Pour les besoins de l'étude, je me suis concentré sur les femmes de 20 à 65 ans qui n'étudient pas. L'échantillon utilisé est composé de 1454 japonaises.

En plus d'apporter des informations économiques et démographiques usuelles, cette base de données contient aussi des informations sur les opinions des répondantes à propos de valeurs philosophiques qui peuvent être reliées à l'opposition entre valeurs modernes et traditionnelles. Celles-ci sont donc utilisées pour créer l'indice de modernité. Cet indice mesure le degré de modernité des valeurs philosophiques des répondantes. Il est le résultat de l'agrégation des réponses aux affirmations suivantes : "*Une personne, qui n'est pas satisfaite avec son époux/épouse, devrait pouvoir divorcer à n'importe quel moment*", "*Si l'époux a un revenu suffisant, il est mieux pour sa femme de ne pas travailler*", "*Le rôle de l'homme est de gagner de l'argent ; le rôle de la femme est de s'occuper du foyer*" et "*Il n'est pas nécessaire d'avoir des enfants dans un mariage*".⁶ Cet indice peut prendre cinq valeurs (0 à 4) dépendamment du nombre de réponses montrant des valeurs modernes. L'intérêt de développer cet indice vient de l'interprétation du coefficient. En effet, si à la place de l'indice, on utilise quatre variables dichotomiques, les coefficients nous informeraient sur l'impact de chaque affirmation sur la participation. Mais en agrégeant toute l'information dans l'indice, cela permet de mesurer différents degrés de modernité des valeurs et donc d'avoir des effets marginaux plus interprétables. Un examen approfondi de l'indice de modernité révèle une bonne diffusion dans la distribution des valeurs au sein de l'échantillon de répondantes, ce qu'illustre le tableau 4.I.

Indice	0	1	2	3	4	Total	Moyenne	Ecart-type
Répondantes	187	278	453	341	195	1454	2.054	1.214

TAB. 4.I. Indice de modernité

⁶En anglais : "*A person, who is not satisfied with his/her spouse, should be able to divorce at any time*", "*If a husband has sufficient income, it is better for his wife not to have a job*", "*A husband's job is to earn money ; a wife's job is to look after the home and family*" and "*It is not necessary to have children in a marriage*".

Le tableau 4.II donne la définition et la moyenne de l'échantillon pour chaque variable utilisée dans les estimations. La variable dépendante est la participation sur

Variable	Définition	Moyenne
Participation	Participe au marché du travail = 1 ; autre = 0	0.637
Age	Age de la répondante	45.9
Highschool	Etudes secondaires terminées = 1 ; autre = 0	0.511
University	Premier cycle universitaire terminé = 1 ; autre = 0	0.115
Married	Mariée = 1 ; célibataire = 0	0.78
Spouse66+	Epoux âgé de plus de 66 ans = 1 ; autre = 0	0.296
Spsselfempl	Epoux travailleur autonome =1 ; autre = 0	0.118
Sphighschool	Epoux - études secondaires terminées = 1 ; autre = 0	0.355
Spuniversity	Epoux - Premier cycle universitaire terminé = 1 ; autre = 0	0.316
Coresidence	Vit avec au moins un des parents ou beaux-parents = 1 ; autre = 0	0.298
Nokid	Pas d'enfant = 1 ; autre = 0	0.191
Kids3Plus	3 enfants ou plus =1 ; other = 0	0.226
HealthCond	Condition de santé autoévaluée de 1 (bonne) à 5 (mauvaise)	2.262
Monoparental	Famille monoparentale = 1 ; autre = 0	0.124
Satisfywsp	Satisfaite dans sa relation avec l'époux = 1 ; autre = 0	0.49
Modernity	Indice de modernité	2.054

TAB. 4.II. Variables

le marché du travail. Les femmes qui n'ont pas déclarées avoir un emploi ou être au chômage sont considérées comme ne participant pas sur le marché du travail. Il n'y a donc pas que les travailleuses qui sont considérées comme participantes mais aussi celles qui recherchent activement un emploi.⁷

4.3 Analyse Univariée : Indice de Modernité et Participation

Les tableau 4.III montre le taux moyen de participation des répondantes pour chaque valeur prise par l'indice de modernité. La tendance semble claire. La participation sur le marché du travail apparaît liée à l'indice de modernité. Si l'on se concentre sur les valeurs extrêmes de l'indice, la participation évolue de 46% pour les

⁷Sasaki (2002) utilise une mesure moins précise de la participation. Il considère toute femme n'ayant pas d'emploi comme une femme au foyer.

	Indice=0	Indice=1	Indice=2	Indice=3	Indice=4
Participation	0.46	0.58	0.66	0.71	0.72

TAB. 4.III. Indice de modernité et participation

femmes ayant les valeurs les plus traditionnelles à 72% pour celles ayant les valeurs les plus modernes. Cette analyse univariée ajoute donc du poids à l'intuition selon laquelle le degré de modernité influence la participation des femmes.

4.4 Estimation

4.4.1 Probits

Pour mesurer l'effet des valeurs modernes et traditionnelles sur la participation, deux estimations probits ont été réalisées. Dans le cadre de ces deux estimations, toutes les variables explicatives sont considérées exogènes.

La première estimation est faite suivant un modèle probit sur les variables exogènes du modèle. L'indice de modernité en est exclu et donc les résultats découlant de cette estimation seront la base de comparaison pour l'interprétation des résultats. Cette estimation est définie par l'équation linéaire suivante :

$$p = \beta_a x + \epsilon_a$$

où p est la propension à participer sur le marché du travail, x le vecteur des variables exogènes et ϵ_a un élément aléatoire non-observable. Les résultats de cette estimation sont reportés dans le tableau 4.V.

La seconde estimation suit un modèle probit comportant les variables exogènes du modèle en plus de l'indice de modernité. Cette estimation est donc celle d'intérêt pour mesurer l'influence des valeurs sur la participation. Cette estimation est définie par l'équation linéaire suivante :

$$p = \beta_b x + \theta_b m + \epsilon_b$$

où p est la propension à participer sur le marché du travail, x le vecteur des

variables exogènes, l'indice de modernité et ϵ_b un élément aléatoire non-observable. Les résultats de cette estimation sont reportés dans le tableau 4.V.

4.4.2 Endogénéité

Pour s'assurer de la pertinence des résultats, une estimation supplémentaire a été réalisée. En effet, l'indice de modernité est une source potentielle d'endogénéité dans le modèle. Il est donc essentiel de contrôler que les résultats ne soient pas affectés par celle-ci. L'endogénéité peut prendre deux formes dans cette spécification. (1) La simultanéité entre la décision de participation et l'évolution des valeurs. Il est raisonnable de penser qu'au contact de ses collègues, les valeurs d'une femme soient influencées par son milieu de travail. Et (2) l'existence potentielle de facteurs non-observables qui affecteraient à la fois la décision de participation et la probabilité d'avoir des valeurs modernes ou traditionnelles. Le niveau de conservatisme ou de modernité du milieu de travail est une variable qui n'est pas mesurable mais qui affecte à la fois la participation et l'indice de modernité. En reprenant l'argument relatif à la simultanéité, on peut donc argumenter qu'une femme travaillant dans un milieu de travail "moderne" devrait voir ses valeurs évoluées vers plus de modernité. Cela conduirait donc à une surestimation de l'effet des valeurs sur la participation. Inversement, dans un milieu de travail "conservateur", l'effet des valeurs sur la participation serait sous-estimé.

Modèle Afin de contrôler pour l'endogénéité, une régression en deux étapes avec variables instrumentales a été réalisée. Supposons que la propension à participer sur le marché du travail et le degré de modernité soient déterminés simultanément par les équations suivantes :

1. $p = \beta x + \theta m + \epsilon$

2. $m = \gamma z + \xi$

où p est la propension à participer sur le marché du travail, m le degré de modernité, x et z les vecteurs de variables exogènes, l'indice de modernité et ϵ et ξ des éléments aléatoires non-observables. Les résultats de cette estimation sont reportés dans le tableau 4.V.

Instruments Les instruments utilisés afin de contrôler l'endogénéité de l'indice de modernité sont le niveau de satisfaction de la femme avec sa vie de famille ainsi que sa satisfaction avec ses amis. La satisfaction dans les relations humaines et les valeurs sont des notions très reliées. En effet, les expériences de vie desquels nous retirons différents niveaux de satisfactions forment nos valeurs.

Une façon de voir cela est de considérer une famille parents/enfants. Une vie de famille satisfaisante implique de l'harmonie dans le foyer et de la compréhension entre les différents membres. Cette compréhension va faire que les parents vont intégrer une partie des valeurs des enfants. A contrario, une vie de famille insatisfaisante va favoriser le refuge vers les valeurs traditionnelles du fait l'opposition entre les membres de la famille. Ce lien entre satisfaction dans les relations familiales et les valeurs se retrouve dans le coefficient positif de la variable mesurant le niveau de satisfaction avec la famille.

Un autre exemple prenant en compte l'amitié serait le suivant. Construire une amitié n'est pas chose facile. Plus que des affinités, une amitié demande une forme de fidélité, du temps à consacrer ou encore de l'empathie. Or toutes ces notions sont liées aux valeurs traditionnelles et donc retirer de la satisfaction de l'amitié va influencer la personne vers ces valeurs traditionnelles. A contrario, une personne qui ne retirera que de la déception de ses relations amicales cherchera des solutions de remplacement plus instantanées et faciles d'accès à travers des activités plus « moderne ». Ce lien entre satisfaction dans les relations amicales et les valeurs se retrouve dans le coefficient négatif de la variable mesurant le niveau de satisfaction avec l'amitié.

Par ailleurs, ces instruments n'influencent pas la participation sur le marché du

travail. D'aucuns pourrait soulever, ici, le fait qu'une femme ayant un niveau de satisfaction faible avec son époux pourrait être incitée à participer sur le marché du travail. Mais cette base de données fait la différence entre la satisfaction avec l'époux et avec la famille. La base contient une variable par chaque. Afin de s'assurer que ce facteur ne joue pas, la variable satisfaction avec l'époux est ajoutée aux variables exogènes dans les estimations contenant l'index de modernité avec et sans contrôle pour l'endogénéité. L'instrument ne souffre donc pas de ce désavantage potentiel.

Plusieurs variables représentant la composition familiale et les conditions de vie font partie des variables exogènes pour les estimations. Cela réduit donc significativement la possibilité d'effets non-désirés dus aux variables non-observables. Pour être valide, les instruments doivent avoir des coefficients significatifs dans la régression de l'indice de modernité (première étape) et des coefficients non-significatifs lors de l'estimation de la participation (deuxième étape). Le tableau 4.IV montre les coefficients des deux instruments pour la première étape de l'estimation et donc supporte la validité des instruments choisis.

Variable	Première étape
Satisfywfamily	0.067 (0.031)**
Satisfyfriendship	-0.057 (0.029)**

Significativité : * : 10%, ** : 5%, *** : 1%

Ecart-types entre parenthèses

TAB. 4.IV. Instruments

Estimation en Deux Etapes Cette estimation en deux étapes est effectuée dans le but de contrôler pour l'endogénéité de l'indice de modernité. A première vue, on serait tenté de suivre la procédure suivante :

1. Estimation probit ordonné de l'index de modernité sur les variables exogènes et les instruments. Puis, récupération et rééchelonnement des valeurs prédites de l'indice de modernité.

2. Estimation probit de la variable de participation sur les variables exogènes et les valeurs prédites de l'indice de modernité.

Toutefois, cette procédure pose le problème de la régression interdite ("forbidden regression"). En effet, le première étape de cette procédure induit une estimation non linéaire et donc pose un problème de consistance des estimates. Angrist et Krueger (2001), dit que ce type de procédure ne peut être valide que si la spécification est exactement la vraie. Du fait de l'inexistence d'une procédure non-linéaire robuste, une estimation linéaire des Doubles Moindres Carrés est certainement l'option qui permette l'estimation la plus robuste, ce qui est, d'ailleurs, conseiller par Angrist et Krueger (2001). De ce fait, une estimation suivant la méthode classique des Doubles Moindres Carrés est effectuée pour éviter le problème de la régression interdite. Les résultats de cette estimation sont reportes dans le tableau 4.V. Dans un soucis de comparaison, des estimations suivant la méthode des Moindres Carrés Ordinaires ont été effectuées pour la spécification sans l'indice de modernité et pour le traitement exogène de l'indice de modernité.

4.5 Résultats

Le tableau 4.V présente les coefficients de régressions pour les différentes estimations réalisées dans cette étude. La colonne "Sans IM" montre les coefficients obtenus du probit ainsi que de la méthode des Moindres Carrés Ordinaires réalisée sans l'indice de modernité. La colonne "IM Exogène" montre les coefficients obtenus du probit ainsi que de la méthode des Moindres Carrés Ordinaires réalisée avec l'indice de modernité. Enfin, La colonne "IM Endogène" montre les coefficients obtenus de l'estimation en deux étapes qui contrôle pour l'endogénéité de l'indice de modernité.

L'éducation et le fait d'être sans enfant ont des effets positifs et significatifs sur la participation des japonaises sur le marché du travail. Par ailleurs, le mariage provoque un effet négatif et significatif sur cette même participation. Cet effet est même

Estimation de la participation des Japonaises sur le marché du travail

	Sans IM		IM Exogène		IM Endogène
	Probit	MCO	Probit	MCO	MC2E
Age	0.0004 (0.0038)	0.0004 (0.0014)	0.0026 (0.004)	0.0011 (0.0014)	0.005 (0.0034)
Highschool	0.35 (0.125)***	0.126 (0.045)***	0.332 (0.125)***	0.117 (0.044)***	0.082 (0.054)
University	0.329 (0.143)**	0.117 (0.512)**	0.291 (0.144)**	0.1 (0.05)**	0.01 (0.087)
Married	-0.796 (0.182)***	-0.292 (0.065)***	-0.71 (0.189)***	-0.252 (0.067)***	-0.291 (0.082)***
Spouse66+	-0.771 (0.146)***	-0.296 (0.051)***	-0.776 (0.146)***	-0.291 (0.05)***	-0.2 (0.061)***
Spselfempl	0.359 (0.116)***	0.126 (0.039)***	0.396 (0.118)***	0.137 (0.039)***	0.181 (0.057)***
Sphighschool	-0.215 (0.126)*	-0.075 (0.045)*	-0.21 (0.126)*	-0.073 (0.044)*	-0.062 (0.05)
Spuniversity	-0.393 (0.138)***	-0.139 (0.493)***	-0.374 (0.139)***	-0.13 (0.049)***	-0.13 (0.056)**
Coresidence	0.21 (0.084)**	0.071 (0.028)**	0.191 (0.085)**	0.063 (0.028)**	-0.047 (0.035)
Nokid	0.462 (0.125)***	0.146 (0.041)***	0.44 (0.131)***	0.140 (0.042)***	0.096 (0.061)
Kids3Plus	-0.063 (0.086)	-0.023 (0.32)	-0.019 (0.086)	-0.007 (0.031)	0.059 (0.061)
HealthCond	-0.099 (0.031)***	-0.034 (0.011)***	-0.121 (0.032)***	-0.041 (0.011)***	-0.044 (0.013)***
Monoparental	0.097 (0.110)	0.034 (0.039)	0.125 (0.11)	0.043 (0.039)	0.081 (0.053)
Satisfywsp			-0.195 (0.085)**	-0.07 (0.03)**	-0.02 (.051)
Modernity			0.15 (0.031)***	0.052 (0.01)***	0.3 (0.186)
Constant	1.156 (0.278)***	0.914 (0.099)***	0.839 (0.291)***	0.796 (0.102)***	0.134 (0.509)
Observations	1454	1454	1454	1454	1454
R ² / Pseudo R ²	0.078	0.096	0.094	0.117	
Wald Chi ²	140.97		159.45		138.91

Significativité : * : 10%, ** : 5%, *** : 1%

Ecart-types robustes entre parenthèses

TAB. 4.V. Résultats

renforcé si l'époux est très éduqué ou s'il est âgé de plus de 66 ans. Toutefois, la propension à participer au marché du travail est plus importante pour les femmes dont l'époux est travailleur autonome. Cela s'explique par le fait que la femme doit travailler pour assurer un complément de revenu fixe au foyer, du fait de l'instabilité des revenus de son époux. Enfin, l'effet de la co-résidence des parents ou des beaux-parents est un accroissement de la propension à participer au marché du travail. Cela corrobore l'explication avancée dans la littérature qui est que les femmes bénéficient de la présence des parents ou des beaux-parents pour participer plus intensivement sur le marché du travail. Cet effet reste donc valide après avoir introduit une mesure du degré des valeurs modernes ou traditionnelles.⁸

Les estimations où l'indice de modernité est considéré exogène suggère que le degré des convictions dans les valeurs modernes ou traditionnelles influencent fortement la propension des japonaises à participer sur le marché du travail. Le coefficient associé à l'index de modernité est positif et significatif quel que soit le traitement. En d'autres termes, plus les femmes ont des valeurs modernes, plus elles sont enclines à participer sur le marché du travail. Cela renforce donc le présupposé selon lequel les femmes ayant des valeurs traditionnelles choisissent de ne pas travailler afin de prendre la charge du travail domestique sur leurs épaules. Un regard plus approfondi des effets marginaux de cette estimation montre qu'un point dans l'index de modernité représente une probabilité de participation accrue de 5.5 points. Suivant ce principe, un écart de 22 points de probabilité sépare donc les femmes qui se situent aux extrêmes de la distribution des valeurs. C'est d'ailleurs proche de l'écart constaté de 26 points dans l'échantillon sur lequel l'étude se base. En effet, les femmes, pour lesquelles l'indice de modernité prend une valeur de zéro, ont un taux de participation de 46% et celles pour lesquelles l'indice vaut quatre, 72%.

Lorsque l'on compare les effets marginaux estimés du modèle probit (et/ou ceux

⁸Voir Morgan et Hiroshima (1983), Yamada, Yamada et Chaloupka (1987), Hill (1989), Ogawa et Ermisch (1996), Nagase (1997) et Sasaki (2002) pour plus de détails.

du modèle MCO) et du modèle de régression à deux étapes pour l'indice de modernité, on remarque que l'effet marginal est plus grand après avoir contrôlé pour l'endogénéité, mais toutefois non-significatif ($p\text{-value} = 0,106$). Considérer l'indice de modernité comme étant exogène semble donc conduire à sous-estimer l'effet des valeurs traditionnelles ou modernes sur la participation. Cela suggère aussi que les milieux de travail seraient plus conservateurs que modernes concernant le rôle de la femme dans la société japonaise.

Toutefois, la non-significativité du coefficient dans l'estimation qui contrôle pour l'endogénéité de l'indice de modernité remet en cause la relation de causalité entre les valeurs modernes ou traditionnelles et la participation des femmes sur le marché du travail. Vella (1994) avait conclu à l'existence de cette relation sans avoir contrôler pour l'endogénéité. Il semble que cette relation de causalité disparaît après avoir traité le problème d'endogénéité. Il y a deux façons d'interpréter cette non-significativité : Soit que la relation de causalité n'existe pas. Soit que l'effet indirect positif des valeurs modernes ou traditionnelles sur la participation, à travers une plus forte propension à co-résider avec les parents ou les beaux-parents, compense exactement l'effet direct négatif qui est que les femmes ayant des valeurs traditionnelles restent à la maison pour prendre la charge du travail domestique.

4.6 Conclusion

L'objectif de ce papier était d'estimer l'impact des valeurs traditionnelles et modernes sur la participation des japonaises sur le marché du travail. Afin de rendre possible cette estimation, un indice mesurant différents degrés de conviction dans les valeurs traditionnelles a été créé à partir de quatre variables représentant différents aspects de l'opposition entre valeurs traditionnelles et modernes. Toutefois, cet indice est aussi une source potentielle d'endogénéité. Une estimation à deux étapes avec variables instrumentales a donc été nécessaire pour contrôler l'endogénéité de l'indice

de modernité. Les résultats remettent en cause le lien de causalité entre les valeurs modernes ou traditionnelles et la participation des femmes sur le marché du travail. En effet, après avoir contrôlé pour l'endogénéité, le coefficient relatif à l'indice de modernité est mesuré non-significatif.

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Chapitre 5

CONCLUSION GÉNÉRALE

Le premier article vise à expliquer l'impact des syndicats sur les travailleurs non-syndiqués dans un contexte de discrimination par gout. Cette économie est composée de deux secteurs : le secteur syndiqué et le secteur non-syndiqué.

En plus de tirer des conclusions du modèle, cet article cherche à expliquer deux faits stylisés : (1) le taux de syndicalisation et les écarts salariaux entre hommes et femmes dans le secteur non-syndiqué sont positivement corrélé, et (2) la syndicalisation provoque à la fois une augmentation des salaires des travailleurs syndiqués ainsi qu'une diminution des salaires des travailleurs non-syndiqués.¹

Le modèle présenté dans cet article est un modèle en trois étapes. La première étape décrit la décision de syndicalisation des individus sur la base du modèle d'Azam and Rospabé (2007). La deuxième étape décrit les décisions d'embauche. Enfin la troisième étape décrit la négociation salariale entre l'employé et l'entreprise.

Les conclusions dérivées de ce modèle sont : (1) que la présence de syndicats accroît les discriminations salariales et la ségrégation occupationnelle pour les travailleurs non-syndiqués ; (2) que le secteur non-syndiqué ne constitue pas une bonne valeur de comparaison pour mesurer l'impact des syndicats sur les discriminations basées sur le genre ; (3) que la discrimination salariale semble persister à long-terme, alors que la ségrégation occupationnelle disparaît à long-terme ; et (4) que le gouvernement peut réduire la ségrégation occupationnelle dans les secteurs syndiqué et non-syndiqué en participant au processus de négociation collective.

¹Le premier fait stylisé s'observe dans les données de l'enquête sur la population active canadienne (1999-2006) réalisé par Statistique Canada. Le deuxième provient des estimations d'Oaxaca et Ranson (1988).

Le second article vise à identifier la discrimination statistique de deuxième ordre comme une cause potentielle des différentes formes de discrimination sur le marché du travail. Par ailleurs, cet article détaille les effets résultant de différentes politiques publiques et structures de marché sur les discriminations lorsque l'on prend en compte la discrimination statistique de deuxième ordre.

Le modèle de base étudie la discrimination salariale et la ségrégation occupationnelle dans un environnement en moyenne-variance. Ce modèle comporte deux catégories de population qui ont la même moyenne de productivité mais les travailleurs du groupe minoritaire ont une variance (bruit) de productivité supérieure. Les firmes maximisent une fonction de profit moyenne-variance qui prend en compte l'information disponible sur les candidats ainsi que leur propre aversion au risque. Ce modèle permet de reproduire l'observation empirique les travailleurs des catégories minoritaires sont à la fois moins rémunéré et employé dans des proportions plus faibles que ceux des autres catégories.

Ensuite quatre politiques publiques (égalité salariale, quota, salaire minimum et subvention pour l'emploi des travailleurs minoritaires) sont testées sur le modèle de base afin d'en prédire les conséquences.

Enfin, le modèle de base ayant été développé pour un marché du travail dont la structure de marché est un monopsonne, deux autres structures de marché y sont étudiées (Oligopsonne et concurrence parfaite) afin de prendre en compte le plus largement possible les différents niveaux de concurrence du marché du travail.

Cet article permet de se questionner sur les méthodes utilisées par les gouvernements pour contrer les discriminations sur le marché du travail. En effet, Les résultats de ce modèle montrent que si l'on prend en compte la discrimination statistique de deuxième ordre, des effets pervers découlent des politiques publiques classiques (quotas, égalité salariale) quel que soit le niveau de concurrence du marché du travail. Ces politiques conduisent à une dégradation des conditions salariales et d'embauche pour la population majoritaire. L'égalité salariale pourrait même jouer négativement sur

l'emploi des catégories qu'elle est sensé protéger.

La mise en place d'un salaire minimum pour assurer la convergence des salaires, semblent être une solution plus raisonnable que l'égalité salariale puisque les effets pervers sur la population majoritaire disparaissent. Toutefois, reste l'effet négatif sur l'emploi des catégories minoritaires.

La subvention pour l'emploi des travailleurs minoritaires semblent être une solution d'intérêt. En effet, le résultat théorique est la convergence des salaires et des niveaux d'emploi à la hausse pour les catégories minoritaire et sans changement pour la population majoritaire. Si le gouvernement est capable de fixer la subvention de manière efficace, le résultat du modèle est que l'égalité salariale et des niveaux d'emploi en résultent. Toutefois, le défaut principal de cette politique est qu'elle engendre un cout pour le gouvernement et donc un besoin de financement. Mais, ce cout est partiellement couvert par les gains que ferait le gouvernement sur les paiements d'assurance emploi.

Agir sur les niveaux d'emploi semble donc plus efficace que d'agir sur les salaires. En effet, lorsqu'une entreprise se doit d'embaucher plus, elle doit stimuler la participation sur le marché du travail et donc, cela peut engendrer un effet positif sur les salaires. Alors qu'en agissant sur les salaires, les entreprises auront tendances en contrepartie à couper sur les emplois.

L'analyse des structure de marché montre que la structure de marche ou les discriminations ont moins de poids est la concurrence parfaite. L'étude comparée des structures de marche permet de montrer que l'étendu des discriminations est proportionnelle au pouvoir de marche des entreprise. En effet, une entreprise seule sur le marché du travail différenciera beaucoup plus entre les différentes catégories socio-économiques qu'une entreprise qui fait face à de multiples concurrents sur le marché du travail. Aussi, les salaires et les niveaux d'emploi sont plus importants pour toutes les catégories socio-économiques dans un marché du travail plus compétitif.

Le troisième article cherche à comprendre l'impact des valeurs traditionnelles et

modernes sur la participation des femmes. Cette étude est réalisée à partir de données sur la société japonaise qui proviennent l'enquête générale sociale japonaise (Japanese General Social Survey) de 2003.

La particularité de cette base de données est qu'elle contient des informations sur la perception des individus sur divers sujets de société et notamment au sein des ménages. Il s'y trouve des données pouvant être utilisées pour relever le niveau de conformité avec les valeurs traditionnelles japonaises.

Comme Vella (1994), plusieurs de ces questions sont regroupées afin de former un indice qui mesure ce niveau de conformité et qui est nommé dans l'article : indice de modernité. Cet indice est ensuite inséré dans les variables explicatives dans une régression permettant de mesurer les déterminants de la participation des femmes japonaises.

Des problèmes d'endogénéité sont identifiables et donc une régression en deux étapes avec variables instrumentales a été utilisée pour répondre à ce problème. Il y a deux sources potentielles d'endogénéité ici. La première est qu'il peut y avoir simultanément puisqu'il est raisonnable de penser que les valeurs peuvent évoluer avec le milieu de vie et de travail et donc qu'une femme qui travaille puisse être influencée vers plus de modernité. La seconde est qu'il y a de potentielles inobservables qui affectent à la fois la probabilité d'avoir des valeurs modernes et la décision de participation. Les résultats remettent en cause le lien de causalité entre les valeurs modernes ou traditionnelles et la participation des femmes sur le marché du travail. En effet, après avoir contrôlé pour l'endogénéité, le coefficient relatif à l'indice de modernité est mesuré non-significatif.