

**Discussion Papers No. 547, June 2008  
Statistics Norway, Research Department**

*Timothy K.M. Beatty and Dag Einar Sommervoll*

**Discrimination in Europe  
Evidence from the Rental Market**

**Abstract:**

This paper considers statistical discrimination in rental markets, using a rich data set on rental contracts from Norway. We find that tenants born abroad pay a statistically significant and economically important premium for their dwelling units after controlling for a comprehensive set of apartment, individual and contract specific covariates. We also find that the premium is largest for tenants of African origin. Moreover, the children of parents born abroad also face a statistically significant and economically important rental premium.

**Keywords:** Statistical Discrimination, Rental Markets, Hedonic Regression

**JEL classification:** J15, R21

**Address:** Timothy K.M. Beatty, Department of Economics, University of York. E-mail:

Dag Einar Sommervoll, Research Department, Statistics Norway. E-mail: [des@ssb.no](mailto:des@ssb.no)

---

**Discussion Papers**

comprise research papers intended for international journals or books. A preprint of a Discussion Paper may be longer and more elaborate than a standard journal article, as it may include intermediate calculations and background material etc.

Abstracts with downloadable Discussion Papers  
in PDF are available on the Internet:

<http://www.ssb.no>

<http://ideas.repec.org/s/ssb/dispap.html>

For printed Discussion Papers contact:

Statistics Norway  
Sales- and subscription service  
NO-2225 Kongsvinger

Telephone: +47 62 88 55 00

Telefax: +47 62 88 55 95

E-mail: [Salg-abonnement@ssb.no](mailto:Salg-abonnement@ssb.no)

## 1. Introduction

Price discrimination is consistent with profit maximizing behavior. Discrimination based on ethnicity is inconsistent with societal norms as expressed in national and international law. Housing is a necessity and therefore the price of rental housing is economically interesting and socially important. In this paper, we study how price discrimination can lead to racial discrimination in the rental market. Price formation in rental markets can be viewed as a signaling game. There is a tension between a profit-maximizing landlord's need to judge the rental risk of each contract signed. This tension may result in a market equilibrium that is privately optimal but socially undesirable.

The study of discrimination has a long and distinguished pedigree in economics. This paper is the first to empirically investigate discrimination in the context of a European rental market. Moreover, we make two additional contributions. We apply the theory of statistical discrimination (Phelps 1972) to rental markets. Compared with other markets where statistical discrimination may occur, rental markets are particularly well suited to empirical study. Finally, we examine a large sample of existing rental contracts and dwelling units, which allows us to quantify the magnitude of discrimination in equilibrium, in contrast to the audit approach taken by much of the previous work on discrimination in rental markets.

Statistical discrimination is most likely to be observed in markets where agent type influences the profitability of a transaction. Examples include markets for labor, health, insurance and housing. Most of the previous work has focused on discrimination in the labor market, beginning with the work of Arrow (1973), Becker (1957), and Phelps (1972). Heckman (1997) makes clear that identifying discrimination in the labor market is difficult. Disadvantaged groups may expect lower returns on educational investments and as a result invest less in education in equilibrium. Because of this, econometric studies in this area confront a serious endogeneity problem; the effects of statistical discrimination and unobserved differences in skill are confounded. A priori, rental markets seem somewhat less plagued by this kind of endogeneity problem. Being a good tenant requires some skill, such as paying rent on time and not damaging the property, but these are not likely to be directly conditional on previous investments in "tenancy skills". This makes the rental market an interesting alternative to labor markets for the study of statistical discrimination.

Ethnic minority groups are present in Europe, but their genesis is starkly different from the American example. As a result, it is unclear how much of the literature developed in a US context is applicable

to Europe. Recent migration to Europe has produced new minority groups and members of these groups report discrimination. In contrast to the US case, members of these groups reached Europe largely by choice. They may have been fleeing from oppressive regimes, or simply be pursuing better economic outcomes. Put differently, they have largely self-selected into a given European country.

Understanding the role of discrimination in a European context is important. European countries typically have well-developed welfare systems. The effect of discrimination in the context of a generous welfare state is an open research question (Nannestad 2007). On the one hand, the presence of a generous social welfare system may mitigate the costs of discrimination as borne by individual members of the group. On the other hand, it may exacerbate the costs of discrimination as born by society as a whole.

In this paper we analyze data from Norway. Norway is particularly well suited to the study of discrimination because until recently, Norway was a linguistically and ethnically homogeneous country with little history of immigration. Moreover, Norway does not have a colonial history; the recent influx of non-western immigrants is a novel phenomenon and is not the result of a long endogenous historical process. The result is a relatively clean social experiment where the presence of past discrimination is less likely to confound the evidence for current discrimination.<sup>1</sup>

The paper is organized as follows. First, we review the literature on statistical discrimination. Based on the existing literature, which largely relates to discrimination in labor markets, we then propose a stylized model of statistical discrimination in the rental market. The theory provides the basis for our empirical specification. We investigate the implications of our model using a new dataset that provides a large and detailed sample of the Norwegian rental market. We then attempt to exclude several competing theories that could explain differences in rent by ethnic group. The final section concludes.

## **2. Statistical Discrimination**

Racial discrimination can manifest itself in different ways. Discrimination may be overt, e.g. refusing to initiate a transaction if a person is of an undesired group. It may also be subtle, e.g. being less accommodating or less willing to negotiate prices for members of certain groups. Finally, discrimination may be the result of the disparate impact of policy if for example, commercial practices

---

<sup>1</sup> See Lundberg and Startz (1998) provide a theoretical justification for the persistence of racial inequality.

or laws that disproportionately harm certain groups (Marsden 1994). If opportunities for success and achievement are due to ascriptive differences, then equality of opportunity is compromised (Roemer 1998). Disparate treatment of this type is expected to yield statistically different outcomes at the mean when two groups differ only by an ascribed difference. However, detecting these differences poses nontrivial econometric challenges. The idea of *ceteris paribus* comparisons, is uniquely challenging when comparing different ethnic groups (Heckman 1998). We now briefly describe the literature of discrimination in labor, rental and housing markets.

## **Labor markets**

The study of discrimination has its origins in the study of labor market outcomes (Becker 1957; Arrow 1973; Phelps 1972). The theory attributes differences in labor market outcomes for otherwise comparable members of different to different, though not mutually exclusive, causes. The first, where an agent acts “as if he were willing to pay something either directly or in the form of reduced income to be associated with some persons instead of others” (Becker 1957) is called a taste for discrimination. The competing theoretical framework, called statistical discrimination, is driven by the presence of differences between groups when the relevant characteristic of an individual group member is not easily observed (Phelps 1972). For example, if an agent is paid the group wage and not the marginal value of their productivity, the result is statistical discrimination. Does statistical discrimination lead to market inefficiencies? Schwab (1986) shows, that statistical information does not necessarily allocate resources more efficiently than in a case where firms ignore such information.

A central focus of the empirical work in this area has been the study of discrimination against African Americans in the US labor market. The consensus seems to be that discrimination is present in this case. However, the use of market data to test for discrimination has been the source of controversy. Heckman (1998) remarks:

**The impact of market discrimination is not determined by most discriminatory participants in the market, or even by the average level of discrimination among firms, but rather at the level of discrimination at the firms where ethnic minorities end up buying, working and borrowing.**

Heckman’s critique is particularly pressing as regards the heterogeneous US labor market. Salaries paid to the same occupation can vary substantially across industries and across regions. If ethnic background varies across industries more or less by chance, the effects of discrimination will be confounded and estimates of wage discrimination will be biased.

Another serious empirical challenge is linked to a debate on the efficiency of discrimination. In an efficient labor market, workers earn their efficiency wage, that is, a wage that reflects the market value

of their true skill level. On the other hand, investments in skill both observed and unobserved, are likely to be conditional on anticipated future returns. If members of a given group believe they face lower returns to skill in the future, they will invest less in the present. In this scenario, a serious endogeneity problem arises. It is hard to distinguish how much of the wage differential that is due to statistical discrimination and how much is due to unobserved differences in skill.

There exists a smaller literature that examines the rate at which the labor market earnings of immigrants converges to the average of non-immigrants in the host country (Chiswick 1978). This literature has found that over the course of 10 to 15 years, immigrants' earnings tend to converge to mean. As with the literature on discrimination in labor markets, comparable endogeneity issues arise. Immigrants are extremely heterogeneous in their labor market skills making identification difficult. Moreover, the arrival of particular groups tends to be clustered in time, which makes disentangling group specific effects from assimilation effects difficult (Borjas (1985, 1995)). While some work has been done on assimilation in Europe, as was the case for the literature on discrimination, most of the empirical examples are drawn from the United States.

### **Discrimination in Housing Markets**

Discrimination in housing market has been the focus of much research by the U.S. government. This has focused on experimental approaches in which an auditor, posing as a potential tenant or buyer, attempts to transact with a landlord or a real estate agent. The causal relationship between ethnicity and discrimination is established by varying group membership of the auditors. Yinger (1986) studies Fair Housing Audits, and finds disparate treatment of minorities in both rental and sales audits. Discrimination takes the form of different information about the number of potential houses, information about asking prices and financing being provided to prospective tenants or buyers of different races. Choi et al. (2005) consider an updated sample and find that while discrimination has declined relative to earlier analyses, it is still present. This kind of disparate treatment yields higher costs of information resulting in higher housing or rental costs. However, audit studies are expensive. Moreover they do not establish the price premium faced by members of a disadvantaged group in a market equilibrium. In this paper, we use a sample of existing rental contracts in order to establish the relative price difference faced by a disadvantaged group.

Yinger (1998) and Dymski (2001) provide overviews of discrimination in housing markets. Interestingly, neither survey references much research on markets outside the United States, and

references no research on discrimination in European housing markets. In contrast, we believe our paper is the first to focus on discrimination in a European rental market.

### **3. A stylized model of statistical discrimination in the rental market**

The rental market is fertile ground for complex signaling games whose equilibria may result in statistical discrimination. The relationship between landlord and tenant can be lengthy and a good match benefits both parties. However, both landlord and tenant have different objectives and face different risks. The tenant faces potential risks regarding attributes of the dwelling that may not be readily observable on first inspection. The landlord faces a complex mix of risks: Will the tenant pay on time? Take good care of the dwelling? How long will they stay? A potential result of this signaling game is a rental contract.

We follow the lines of statistical discrimination as described in Phelps (1972) for labor market outcomes. We assume that landlords have some beliefs over tenant type given an observed set of socio-demographic characteristics. These can be justified in the sense that they reflect true differences between groups, or they may be unjustified and prejudiced. In what follows we do not attempt to distinguish between these causes, though they may differ with regard to their impact on economic efficiency.

Assume landlords have heterogeneous preferences with respect the risk/return tradeoff. Each landlord  $j$ , can rent out dwelling unit  $k$ , which yields an expected monthly return of  $E(r_k)$  with variance  $\text{var}(r_k)$ . Heterogeneous landlords have different attitudes towards risk and will rank bundles of first and second order moments of returns differently. We model this by assuming a twice continuously differentiable concave (sub) utility function  $U$  that depends on the first and second moments of the distribution of returns:

$$U_j = U_j(E(r), \text{var}(r)).$$

We assume that utility is increasing in expected monthly return and decreasing in variance.

Assume that the first and second moments of the distribution of rental returns of the dwelling unit are functions of the terms of the contract,  $L_k$  in particular on the contracted price  $p_k$ , and finally on expected tenant behavior. Further, assume that tenants can be partitioned into  $G$  groups based on

observable characteristics. Each tenant, indexed by  $i$ , belongs to a single group denoted  $g_i$ . Finally the value  $g_i$  is common knowledge. In summary, the landlord knows that the first and second order moments of the distribution of rental return are functions of monthly rental,  $p_k$ , other contractual terms,  $L_k$ , and group membership  $g_i$ . Formally, the landlord considers, the first and second moments of the distribution of returns

$$E(r_{k,i}) = E(r_{k,i}(p_k, L_k, g_i)),$$

$$\text{var}(r_{k,i}) = \text{var}(r_{k,i}(p_k, L_k, g_i)).$$

Each landlord also has the option to sell the unit rather than renting it out. In this model, the decision to sell (e.g. not rent) fixes the landlord's reservation price in the rental market. If the landlord decides to sell, the expected monthly return (abstracting from transaction costs) is  $E(\bar{r}_k)$  with variance  $\text{var}(\bar{r}_k)$ . A landlord  $j$  will rent out a dwelling unit to a tenant from group  $i$  if and only if, the utility from renting to a member of group  $i$ , with a rental contract characterized by price  $p_k$  and other contractual terms  $L_k$ , exceeds the reservation utility obtained from selling the apartment,

$$U_{j,i}(E(r_{k,i}(p_k, L_k, g_i)), \text{var}(r_{k,i}(p_k, L_k, g_i))) \geq U_j(E(\bar{r}_k), \text{var}(\bar{r}_k)).$$

The tenant's choice problem is relatively straightforward. Tenants are assumed to have well-behaved separable utility functions defined over housing consumption  $c_H$  and other consumption  $c_O$ . We can write the utility of tenant  $i$  as,

$$U_i = U_i(c_H, c_O)$$

Further the hedonic characteristics of rental object  $k$  are denoted  $x_k$ , and as before  $L_k$  are contract specific terms,

$$c_H = c_H(x_k, L_k).$$

We do not make any strong assumptions about how contracting occurs. If we observe a completed contract for dwelling unit  $k$  by a tenant from group  $i$ , then there exists a reservation price  $\bar{p}_k$ , such that the maximization of tenant utility  $U_i = U_i(c_H, c_O)$  yields a willingness to pay for the dwelling unit greater than the landlord's reservation price. As a result a rental contract is signed and the unit is rented for a rental price of  $p_{k,i} \geq \bar{p}_k$ . When a rental contract is agreed to, the observed market rental price for object  $k$  can be summarized by



$$p_{k,i} = p_K(x_k, L_k, g_i).$$

This equation motivates the empirical work that follows. We turn now to a description of our unique data source and then describe our empirical approach.

## 4. Data

The presence (or absence) of statistical discrimination in rental markets is an empirical question. In this section we discuss the survey and administrative data that provides the basis for our analysis. A detailed survey of the Norwegian rental stock was conducted as a part of the constructing the consumer price index. Information on the hedonic characteristics of each apartment was collected, as was information on the rental contract characteristics and some demographic information about the tenant. We were able to link tenants to information in Statistics Norway register of all residents in Norway, which allows us to determine whether or not they are Norwegian by birth and if not, their country of origin. In what follows we refer to these groups as Norwegian and Non-Norwegians respectively. Table 4.1 reports summary statistics for the two groups respectively. Table 4.1 reports summary statistics for the two groups respectively.

**Table 4.1 Summary Statistics for Tenants by Country of Birth**

	Norwegian (n=2474)	Non-Norwegian (n=414)
Female	49.8 %	38.2%
Age	34.1	34.5
University Degree	4.3%	41.3%
Oslo	33.6%	53.6%
Single	52.7%	46.1%
Living with Spouse	34.3%	43.2%
Living with Kids	3.5%	6.5%
Living with Parents	0.4%	0.2%
Living with Siblings	1.3%	2.2%
Living with Friends	9.3%	7.5%

There are a couple of notable differences between the groups. The most striking difference is that Non-Norwegian tenants have on average significantly higher education than native Norwegians. Non-Norwegians are also more likely to live in Oslo, are less likely to be single, are more likely to be living with a spouse, a sibling and/or children, but are less likely to be living with friends.

**Table 4.2 Hedonic Attributes of Dwelling Units by Country of Birth**

	Norwegian (n=2474)	Non-Norwegian (n=414)
City Center	64.75%	79.95%
Rural	12.93%	7.73%
Log Distance to Center	6.88	6.51
Log Size	4.20	4.11
Balcony	32.98%	43.00%
Log High Standard Index	0.59	0.57
Furnished	23.44%	26.33%
Heating Included	23%	26%

Table 4.2 shows that the dwelling units rented by Norwegians and Non-Norwegians are broadly comparable. Non-Norwegians are more likely to live in the city center and are less likely to live in rural areas. Non-Norwegians are more likely to rent slightly smaller dwelling units and are more likely to have a balcony, rent a furnished apartment and have heating included in their rent.

## 5. Empirical Analysis

We now turn to the empirical implications of statistical discrimination in the rental market. We begin by providing some evidence that there are group differences between Norwegians and Non-Norwegians that landlords may use as the basis for statistical discrimination. We then look at the empirical evidence for the implications of our stylized model. First, we test whether those groups landlords may believe to be riskier are charged higher rents. To test whether our results are due to unobserved taste preferences we construct an alternative treatment group, “first generation” Norwegians. We then exploit a feature of the Norwegian tax code that encourages homeowners to rent out portions of their homes. This has created a large group of small-scale landlords who cannot trade-off between risk and return in the same way as large-scale landlords. Finally, we look at whether landlords trade-off between risk and return by considering the role of intermediation in the rental market.

### Differing Expectations

Statistical discrimination requires that landlords have different beliefs over the expected returns or the expected variability of returns between Norwegians and Non-Norwegians. To see whether there is any readily observable evidence that supports different beliefs, we first note the unemployment rates between Norwegians and Non-Norwegians. The unemployment rate for Non-Norwegians is roughly

three times greater than for Norwegians (4.5% vs. 1.5%). Knowledge of this fact might cause a landlord to believe that a Non-Norwegian will be less able to pay rent. Second, we obtained records from the tenant court for the greater Oslo region for the period January to May 2008. The tenant court adjudicates claims between landlord and tenants. Typically this will involve a landlord attempting to retain a part of the three-month deposit, required of all rental contracts, for non-payment or to repair damage to the dwelling unit. We obtained the names of the tenants and the landlords in all cases brought before the tenant court. Names were classified as Norwegian or Non-Norwegian. If there was any ambiguity the name was classified as Norwegian. We found that cases involving obviously Non-Norwegian tenants made up 39% (45 of 115) of the whole. In the rental survey we find that Non-Norwegians make up 27% (222 of 831) of the tenants in the greater Oslo area. These differences between groups provide some evidence that landlords may believe that the expected return or the variance of returns may differ between the two groups.

Our theoretical approach suggests that the observed price of dwelling unit  $k$  will be a function of hedonic characteristics  $x_k$ , contract terms  $L_i$  and, if statistical discrimination is present, group membership  $g_i$ . We follow standard practice in the hedonics literature and choose a semi-log specification,

$$\ln p_{k,i} = \alpha + \beta^T x_k + \gamma^T g_i + \delta^T L_k + u_{i,k},$$

where  $\beta$ ,  $\gamma$  and  $\delta$  are parameter vectors to be estimated and  $u$  is a well behaved error term.

Regression models of this type are widely used when testing for statistical discrimination (Cain 1986).

An implication of the stylized model is that if landlords have different expectations as regards the variability of returns between groups, they will require a higher expected return from the riskier group. Given the information on relative riskiness provided above, we expect that the coefficient for Non-Norwegian tenants to be positive.

The hedonic characteristics in  $x$  consist of a fairly complete description of the dwelling unit. We control for location: whether the dwelling unit is in Oslo, whether it is proximate to the city center, whether it is in a rural area, the natural logarithm of the distance to the city center. We control physical characteristics of the unit: log size (measured in square meters), the presence of a balcony, and an index which measures the degree to which the unit is finished to a “high standard”. We also control for services included in the contract,  $L$ . These include whether or not the rent includes heating and whether or not the dwelling unit is furnished.

Finally we include a vector of characteristics that the landlord may use to classify individuals into groups. For each tenant, we include their age, whether or not they have university education, whether or not they are female, and our crucial policy variable, whether or not the tenant was born in Norway. We include dummy variables to indicate the presence of a spouse, children, parents, siblings or friends in the dwelling unit. We also incorporate dummy variables to indicate whether the rent is being paid by someone other than the tenant, by their employer or by the municipality by way of social assistance. Table 5.1 summarizes the main regression results.

**Table 5.1. OLS Results**

Variable	Estimate (Robust t-statistic)
Oslo	0.242 (15.60)**
City Center	0.189 (11.79)**
Rural Area	-0.204 (7.61)**
Log of Distance to City Center	-0.010 (1.44)
Log Size (m <sup>2</sup> )	0.297 (14.55)**
Balcony	0.041 (3.01)**
Log of High Standard Index	0.078 (5.94)**
Furnished	0.009 (0.58)
Log of Heating	-0.008 (0.44)
Female	0.024 (1.89)
Age	-0.000 (0.59)
Single	-0.106 (1.94)

Robust t statistics in parentheses.

\* significant at 5%; \*\* significant at 1%

**Table 5.1. (cont.)**

Variable	Estimate (Robust t-statistic)
Living with Spouse	-0.022 (0.41)
Living with Children	0.078 (1.48)
Living with Parents	-0.240 (1.95)
Living with Siblings	-0.094 (1.26)
Living with Friends	0.230 (4.21)**
University Educated	0.032 (1.42)
Rent Paid by Others	0.098 (3.40)**
Rent Paid by Employer	-0.205 (1.45)
Rent Paid by Municipality	0.081 (3.62)**
Non-Norwegian by birth	0.069 (3.65)**
Constant	7.067 (60.72)**
Number of Observations	2888
R-squared	0.41

Robust t statistics in parentheses.

\* significant at 5%; \*\* significant at 1%

The point estimate of the key variable, the dummy variable indicating a non-Norwegian tenant, is 0.069. The estimate is statistically significant at all conventional levels and is economically large. In other words, non-Norwegians are spending approximately 7% more than Norwegians on a *ceteris paribus* basis. This is consistent with statistical discrimination based on ethnic background as described above. Interestingly, none of the other tenant specific information, such as age, gender or education, is statistically significant.

Consistent with much of the previous hedonic literature, the physical characteristics of the dwelling unit capture much of the variation in price. Location variables are statistically significant and large. Being located in Oslo yields a 24% premium, being located in the city center yields a 19% premium and being located in a rural area results in a 20% discount. As expected, the size of the unit, the

presence of a balcony and the fact that a unit is finished to a high standard are all positively and significantly associated with price.

We see that the dummy variables that capture the effects of sharing the unit do not affect the rent significantly, apart from renting with friends. Renting with friends on the other hand has a statistically significant and large influence on rents, ( $e^{0.23} = 0,26$ ). It is interesting to note the considerable differences when a third party pays rent. If the employer pays rent, the point estimate suggests a large discount, albeit one that is not statistically significantly different from zero. However, if the municipality pays rent, rents are 8% higher. One possible explanation is that rent paid by employer is viewed as an extra guaranty all else equal, but aid from the municipality in the form of rental payments, may send a more mixed signal.

### Country of Origin

Non-Norwegians are a heterogeneous group. Non-Norwegians can be from neighboring countries or from far away, both geographically and culturally. Landlords may believe that the variability of returns differs between these groups. We account for this diversity by extending the previous analysis. We divide the Non-Norwegian dummy into a series of continent of origin specific dummies: Africa, Asia/Oceania, America and Europe.

Table 5.2 reports the results for the continent of origin dummies. In the interests of space, we only report estimates of the coefficients on the country of origin dummies. Coefficients on the remaining variables were virtually unchanged from the original specification.

**Table. 5.2. Continent of Origin Dummies**

	Estimate (Robust t-statistic)
Africa	0.113 (3.19)**
Asia/Oceania	-0.005 (0.15)
America	0.038 (0.73)
Europe	0.050 (2.37)*
Observations	2888

Robust t statistics in parentheses.

\* significant at 5%; \*\* significant at 1%.

Our results show that tenants from Africa pay on average 11% more, again when controlling controlled for a wide array of apartment and individual specific characteristics. The result is statistically significant at all conventional levels and economically large. Tenants from Europe also pay 5% more on a *ceteris paribus* basis. The effect is statistically significant at the 5% level. Immigrants from Asia/Oceania and America do not appear to pay more, the coefficient estimates are smaller and are not statistically significant.

### **First Generation Norwegians**

Results above may be due to unobservable heterogeneity between Norwegians and Non-Norwegians. For example, Non-Norwegians may value the attributes of dwelling units differently. Given the nature of the data, a direct test of this hypothesis is not possible. Instead we construct an alternative treatment group, tenants who have both parents born outside of Norway. We presume that any unobservable taste differences between Norwegians and first generation Norwegians should be smaller than those between Norwegians and Non Norwegians. These “first generation” Norwegians presumably have comparable language skills and social knowledge via mandatory public schooling and (for males) compulsory military service.

Estimating the hedonic regression above on a subsample comprised of “first generation Norwegians” and Norwegians, we find that the “first generation” Norwegians pay 7 percent more than Norwegians *ceteris paribus*. The effect is statistically significant at all conventional levels and is economically important. Interestingly, the premium is of comparable magnitude to the estimated premium paid by Non-Norwegians above. All other coefficients are similar to those in the original specification. This result is consistent with statistical discrimination. Moreover, this provides some cautious evidence that differences are not being driven by unobservable taste heterogeneity.

### **Landlord Heterogeneity**

In a sample of existing rental contracts, statistical discrimination can take on different forms. As above, it may result in a landlord offering the same dwelling at different prices to members of different groups. However, if a given landlord has preferences such that the rent required to rent to a member of a particular group is sufficiently high, no contract with a member of that group will be struck. In the previous analysis we focused on completed contracts, now we try and find evidence of missing contracts by examining a special group of landlords. The Norwegian tax system encourages

homeowners to rent out part of their home<sup>2</sup>. This segment of the rental market, where landlord and tenant live under the same roof, is of special interest. Renting out a single (or a small number of) dwelling unit does not allow a landlord to diversify risk across tenants. Because of this, all else equal, landlords renting out a single unit require higher expected returns for a given level of risk than a landlord renting out multiple units. As a result, tenants in the risky group should be able to rent an equivalent object from landlords who rent out multiple units, at a lower price. The empirical implication is that fewer members of the group thought to have a higher variance should be observed renting from small-scale landlords.

Table 5.3 shows the distribution of Norwegians and Non Norwegians in the different market segments, either living in the same building as the landlord or not.

**Table 5.3**

	Same Building (percent)	Not Same Building (percent)
Norwegian	808 (89)	1666 (84)
Non-Norwegian	98 (11)	316 (16)
<b>Total</b>	<b>906 (100)</b>	<b>1982 (100)</b>

We see that Non-Norwegians are under represented relative to Norwegians amongst those landlords who share a roof with their tenants. The probability of renting in this segment is almost 50% higher for Norwegians (16 versus 11 percent). This difference is statistically significant. This provides some modest evidence that this group of landlords may set their reservation price for Non-Norwegians above the price asked by large scale landlords, such that Non-Norwegian tenants look elsewhere.

Alternatively, those landlords who sign contracts with tenants they deem risky will demand a rental premium. Table 5.4 shows the results of running the model on each landlord segment separately.

---

<sup>2</sup> Rents are taxable income for landlords. In Norway landlords are divided according to size. A professional landlord is defined to be a landlord who rents of 5 objects or more. In this case net rents, that is rent minus incurred expenses are taxed as income. For small-scale landlords (less than 5 units) net rents are taxed as capital return (28 percent). A separate rule applies for renting out part of your own home (this rule exists to stimulate the supply side of the rental market), if the rental unit does not exceed 50 percent of the home, returns are tax exempt.



**Table 5.4**

	Same Building	Not Same Building
Non-Norwegian	0.044 (1.46)	0.068 (3.05)**
Number of Observations	906	1982
R-squared	0.42	0.44

Our results show that Non-Norwegians appear to pay more in both segments, 4.4% for co residents versus 6.8% in complementary segment. These findings are consistent with more careful screening by co resident landlords.

### **Intermediation**

A landlord may use informal recommendations from friends and acquaintances as a means of mitigating risk. Though a landlord may have no preference for giving a rebate to the acquaintance of a friend, the stylized model above suggests a lower reservation price if a prospective tenant is thought to be of lower risk.

The rental survey contains information on how a given dwelling unit was located. We assume that if the tenant found the rental object via the Internet or in a newspaper, the tenant and landlord had no prior knowledge of one another. Hence, the landlord may face, or believe they face, a higher risk than if they had found the tenant some other way, through work, friends or family. To this end, we include a dummy for third party intermediary in the hedonic specification above. This yields a statistically significant and economically large coefficient of 0.21. That is, the contracted rental price for a dwelling unit located via a third party is 21% percent higher *ceteris paribus* than a unit located via other means. As regards our key variable of interest, we find that once personal intermediation is accounted for, Non Norwegians pay on average 5.3 percent more than Norwegians. The estimate is statistically significant at all conventional levels.

## **6. Alternative Theoretical Approaches**

In the previous section we find evidence consistent with the hypothesis that landlords statistically discriminate against Non-Norwegians. However, there are alternative theoretical approaches that may give rise to Non-Norwegians paying higher rents than Norwegians. We now investigate several alternative mechanisms by which this might occur.

## **Social Networks/Assimilation**

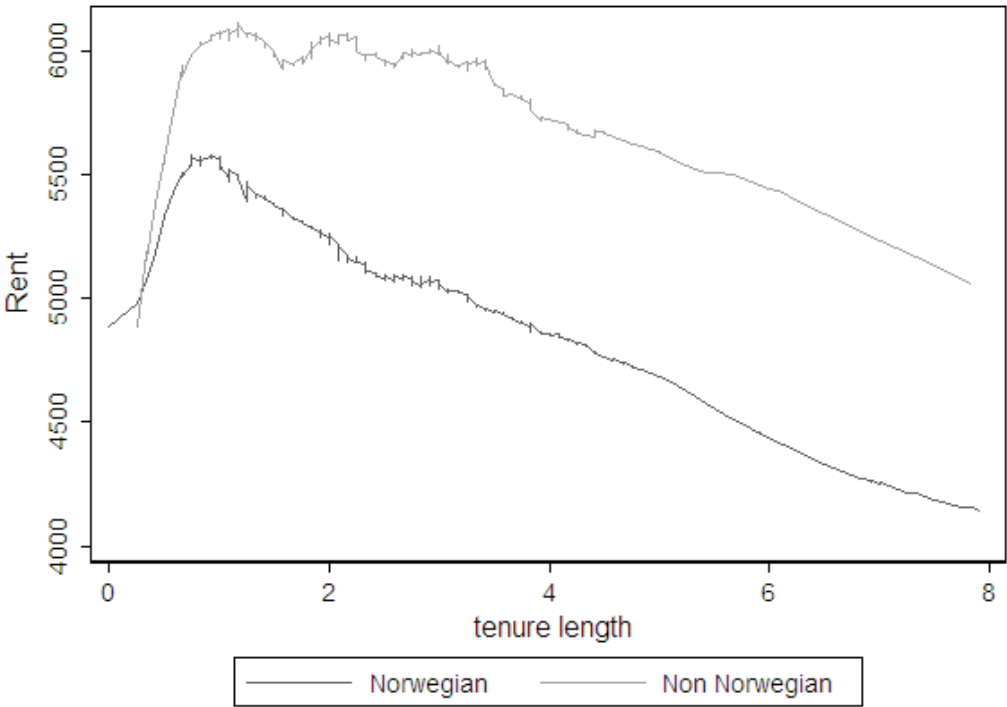
Finding a rental object involves search costs, and larger social networks may make these costs smaller. In general, Non-Norwegians face higher search cost due to language and cultural barriers and due to less developed social networks. To see whether Non-Norwegians with presumably larger social networks and better language skills pay more for comparable dwelling units, we restrict our sample of Non-Norwegians to those who have lived in Norway for more than 10 years. The intuition is simply that the social network of a recent arrival is expected to increase over time. Note that this reduces number of Non-Norwegians in our sample by over half (from 414 to 185). Estimating the previous hedonic specification on this subsample yields a 4.2 percent differential between Non-Norwegians and Norwegians. The difference is statistically significant at the 10% level. This provides some evidence in favor of the assimilation hypothesis, but the small sample size makes drawing definite conclusions difficult. Evidence against the assimilation hypothesis comes from the previous results on “first-generation” Norwegians. We found that “first-generation” Norwegians, despite being born and educated in Norway, pay a premium close to that of Non-Norwegians. This suggests that the social network/ assimilation hypothesis cannot explain all of the results from the previous section.

## **Tenure Length**

The analytical model presented above tells a story about landlords faced with incomplete information about rental risk, which they believe varies across groups. Because a rental contract is not a one shot game, tenants and landlords learn more about each other over the course of the rental contract. As the tenant’s type is revealed, rent can be implicitly or explicitly adjusted; good tenants can be rewarded by rent changes that are lower than the market or legal limits. Hubert (1995) presents a model where presence of tenure security laws results in both pre- and post-contractual selection depending on agent characteristics. Furthermore, length-of-residence discounts tend to be present in rental markets (Goodman and M.Kawai 1985; Barker 2003; Goodman and Kawai 2003).

The question of tenure length is important when comparing Norwegians to Non-Norwegians. Non-Norwegians have on average shorter tenures (2.6 years compared to 3 for Norwegians) and miss out on discounts associated with longer tenure. In short, tenure length rather than statistical discrimination might explain the findings in the previous section. To this investigate this hypothesis, we plot rent as a smoothed function of tenure length for the two groups in question.

**Figure 6.1. Rent as a smoothed function of tenure length (Tricube smoothing) Rent in Norwegian kroner and tenure length in years**



Consistent with previous work, we see that rent declines as tenure length increases. Both Norwegian and Non-Norwegian tenants benefit from discounts associated with longer tenures. The decline is strikingly similar between the two groups, but a price differential persists over time. In other words, price differentials present at the beginning of a rental contract persist throughout the life of the contract. Tenure length is clearly an important predictor of rent, but it does not rule out statistical discrimination.

Alternatively, one could control for tenure length by introducing the natural logarithm of tenure length into the hedonic regression in the previous analysis. This specification reduces the point estimate on the Non-Norwegian dummy to 0.06, but it remains highly significant. All other results are largely unchanged. This suggests that the premium paid by Non-Norwegians is not satisfactorily explained by differences in tenure length.

**7. Conclusion**

Statistical discrimination may hurt individuals of disadvantaged groups, and compromise equal opportunity and basic human rights. It may also have an adverse effect on market efficiency. The

question of ethnic discrimination is particularly pressing in European countries, where recent immigration has created visible minority groups in what were previously largely homogenous populations with respect to culture and language.

We have argued that rental markets are well suited for the study of discrimination. In particular, they appear to confront far fewer empirical difficulties than labor markets. First, much of the price variation in rental units can be explained by readily observed hedonic attributes, whose prices are plausibly exogenous to individual tenants. Second, the confounding of rational underinvestment in labor market skills and discrimination seems less problematic in the rental market. The range of available investments that a prospective tenant can make in “rental market skill” is far smaller than the range of available investments that a prospective employee can make. This difference allows us to more easily obtain estimates of statistical discrimination.

Our findings are consistent with the presence of statistical discrimination in the rental market. We find a premium of 6-7% for being a Non-Norwegian tenant. When we extend the analysis by considering continent of origin we find that tenants from Africa pay the largest premium, 11%. We also find that tenants born in Norway, but whose parents were born abroad pay a premium of 6.9%, which is directly comparable to the premium, paid by Non-Norwegians. These differences are economically important and are consistent with landlords using race to assign tenants to groups. Moreover, consistent with the implications of our model, we find that Non-Norwegian tenants are underrepresented in market segments where we have reason to believe landlords may be more risk averse. These findings provide some evidence in favor of the hypothesis that Non-Norwegians are experiencing statistical discrimination.

However, some caution is required in drawing broad conclusions based on our results. Because our data consists of a simple cross-section, further study is required to cleanly establish causality. Specifically, we never directly observe the counterfactual, i.e. it would be desirable to observe the same rental unit rented by both a Norwegian and a Non-Norwegian tenant. But the fact that “first generation” Norwegians, e.g. those who differ in their ethnic background, but have broad and deep exposure to Norwegian language and institutions, appear to pay a rental premium that is comparable to that of Non-Norwegians. This provides some modest evidence that the link between ethnicity and rental premium may be causal.

## References

- Arrow, K.J. (1973): The Theory of Discrimination. *Discrimination in Labor Markets*. Princeton, Princeton University Press: 3-33.
- Barker, D. (2003): Length of residence discounts, turnover, and demand elasticity. Should long-term tenants pay less than new tenants? *Journal of Housing Economics* **12**(1): 1-11.
- Becker, G.S. (1957): *The Economics of Discrimination*. Chicago, University of Chicago Press.
- Belsby, L., A. Holmøy, et al. (2005): Leiemarkedsundersøkelsen 2005. SSB-rapport 2005 **32**.
- Borjas, G.J. (1985): Assimilation, changes in cohort quality, and the earnings of immigrants. *Journal of Labor Economics* **3**(4): 463-489.
- Borjas, G.J. (1995): Assimilation and changes in cohort quality revisited: What happened to immigrant earnings in the 1980s? *Journal of Labor Economics* **13**(2): 201-245.
- Cain, G.G. (1986): The Economic Analysis of Labor Market Discrimination: A Survey. *Handbook of Labor Economics*, Elsevier Science Publishers. **I**: 693-785.
- Chiswick, B.A. (1978): The effect on Americanization on the earnings of foreign-born men. *Journal of Political Economy* **86**(5): 897-921.
- Choi, S.J., J. Ondrich, et al. (2005): Do Rental Agents Discriminate Against Minority Customers? Evidence from the 2000 Housing Discrimination Study. *Journal of Housing Economics* **14**(1): 1-26.
- Dymski, G.A. (2001): Is Discrimination Disappearing? Racial Differentials in Access to Credit, 1992-1998. *International Journal and Social Economics* **28**(10/11/12): 1025-1045.
- Goodman, A.C. and M.Kawai (1985): Length-of-Residence Discount and Rental Housing Demand: Theory and Evidence. *Land Economics* **61**(2): 93-105.
- Goodman, A.C. and M. Kawai (2003): Following a Panel of Stayers: Length of Stay, Tenure Choice, and Housing Demand. *Journal of Housing Economics* **12**: 106-133.
- Heckman, J.J. (1998): Detecting Discrimination. *The Journal of Economic Perspectives* **12**(2): 101-116.
- Hubert, F. (1995): Contracting with Costly Tenants. *Regional Science and Urban Economics* **25**: 631-654.
- Lundberg, S. and R. Startz (1998): Race, Information and Segregation. Working paper, University of Washington.
- Marsden, M. (1994): Board issues fair lending policy statement. *Financial Update* **7**(1-2): 1-3.
- Nannestad, P. (2007): Immigration and welfare states: A survey of 15 years of research. *European Journal of Political Economy* **23**: 512-532.
- Ondrich, J., A. Stricker, et al. (1999): Do Landlords Discriminate? The Incidence and Causes of Racial Discrimination in Rental Housing Markets. *Journal of Housing Economics* **42**(3): 185-200.

Phelps, E. (1972): The Statistical Theory of Racism and Sexism. *American Economic Review* **62**(4): 695-661.

Roemer, J. (1998): *Equality of Opportunity*. Cambridge, Harvard University Press.

Schwab, S. (1986): Is Statistical Discrimination Efficient? *The American Economic Review* **76**(1): 228-234.

Yinger, J. (1986): Measuring Racial Discrimination with Fair Housing Audits: Caught in the Act. *The American Economic Review* **76**(5): 881-893.

## The Norwegian rental survey and the Norwegian rental market

This appendix provides a brief overview of the Norwegian rental survey that forms the basis of the empirical exercise above. We also provide some institutional detail on the Norwegian rental market.

### Norwegian Rental Survey

The Norwegian rental survey began in 2005, and is conducted annually. Data used in this paper comes from the 2006 version of the survey is the result of interviews performed during the period February to June 2006.

A primary representative sample of 18 000 Norwegian residents was initially drawn from the register of all residents of Norway, conditional on not living in a self owned dwelling. The sample is representative in the sense that it the Norwegian adult population regarding gender, age and geographical distribution (for further details see Belsby et al (2005)). However, past experience of the rental market survey show that non-response can be an issue for certain groups, notably younger tenants and residents of Oslo. To this end, these two strata were oversampled by drawing an additional 2000 potential tenants in Oslo, and an additional 8000 young tenants. Table A.1 summarizes the sampling procedure.

**Table A.1**

Category	Number of potential tenants
Primary sample	18 000
Oversampling of Oslo	2 000
Oversampling of young households	8 000
Total	28 000

Table A.2 summarizes reasons for non-response, and the number of renters found in the net sample.

**Table A.2**

Category	Number	Percent
Sample (persons assigned for interview)	28 000	
Inadmissible (deceased/living abroad)	146	
Gross Sample	27 854	100
Non-response (missing telephone number)	7 464	26.8%
Other non response	4 572	16.4%
Net sample (interview preformed)	15 818	56.4%
Renters in net sample	5 169	32.4%

Of this net sample of 5169 tenants, 3625 was uniquely identified with background information regarding socio-demographic information like gender, age, education level, and country of birth. Tenants in social housing and in student accommodation run by the government face rents defined at a political or administrative level. These rents need not be market rents, as a result these tenants (625) are excluded from the analysis.

### **Institutional Detail**

Norway has several laws that govern the tenant landlord relationship. The law's goal is to provide both parties with legal protection. In the following we will briefly outline the relevant paragraphs of the Norwegian Rental Law (NRL)<sup>3</sup> that relate to price formation in the private rental market.

The NRL divides rental contracts into two types: Time-limited and time-unlimited<sup>4</sup>. Time limited contracts are typically required to last at least 3 years, but exceptions are allowed and time-limited contracts of short length are often observed. In a time-limited contract, rents can be inflation adjusted yearly and rents can be renegotiated every third year. Tenants have the right to request that rents should be set to market rent, if the rent exceeds the market rent. In this respect the NRL is skewed towards the tenant. However, this clause is seldom invoked, and when invoked has largely involved social housing. Landlord protections in the NRL include the right to evict the tenant in case of contract default, and compensation for damaged property exceeding natural wear and tear. In practice, eviction involves considerable time and transaction costs for landlords.

<sup>3</sup> The Norwegian Rental Law (Lov om Husleieavtaler- Lov 1999-03-26 <http://www.lovdato.no/all/h1-19990326-017.html>)

<sup>4</sup> The Norwegian union of tenants (Leieboerforeningen) estimates that less than 1 percent of all contracts are time unlimited and we do not discuss them further.



The NRL explicitly states (paragraph 1.8) that discrimination based on ethnic background, nationality, religious belief or sexual orientation is illegal. Moreover the NRL explicitly references the more general Norwegian laws regarding discrimination the Antidiscrimination Law, ADL (diskrimineringsloven<sup>5</sup>) and the discrimination protection agency law, DPAL (diskrimineringsombudsloven<sup>6</sup>).

Landlords pay taxes on rental income according to the scope of their operations. A professional landlord, defined to be a landlord that rents of 5 objects or more, pays income tax at the standard rate<sup>7</sup> on net rents (rents minus incurred expenses). For small-scale landlords (less than 5 units) net rents are taxed as capital return (28 percent). A separate rule applies for landlords renting out a part of their own home. In order to stimulate the supply side of the rental market, if the rental unit does not exceed 50 percent of the house, then rental income is tax exempt.

---

<sup>5</sup> Antidiscrimination Law (Lov om forbud mot diskriminering <http://www.lovdato.no/all/h1-20050306-033.html>)

<sup>6</sup> Lov om Likestilling- og diskrimineringsombudet og Likestillings-og diskrimineringsnemda <http://www.lovdato.no/all/h1-20050610-040.html>)

<sup>7</sup> Marginal tax in Norway is capped at 48 percent.