SUMMARY

In this study we have tried to answer the questions of whether and how it is possible to explain differences in effects of "crowding out" between segments of the labor market and between the men and women within those segments. Crowding out is defined as a situation in which highly educated employees get jobs that were held by lower educated employees. There are several important reasons to pose these questions. First, there are contradictions in current research about effects of crowding out. Even when the same data are used, researchers have arrived at different contradictory conclusions. These contradictions primarily result from differences in theories that are used and models that are tested. Second, the well-documented differences in the allocation of employees over jobs between segments of the labor market is also likely to cause differences in effects of crowding out between segments, and little attention has been paid to this possibility. Finally, the well-documented differences in the allocation of men and women to jobs and segments is also likely to cause differences in effects of crowding out on men and women.

A problem in evaluating and comparing existing research is caused by the different models and theories of the functioning of the labor market. Therefore the different models and theories that are most frequently used to explain effects of crowding out are compared in chapter 2. The theories and models mentioned are: the human capital theory, the job competition model, the hedonic theory of wages, the screening hypothesis, the credentialist theory, the theory of segmented labor markets, efficiency wage models and a recent search model developed by Teulings.

Next we examine the ability of each of these models and theories to explain effects of crowding out. These comparisons show that effects of crowding out can be explained when three assumptions are made. The first assumption is that unemployment must exist. The second necessary assumption is that downwardly rigid wages must exist that is, despite of an excess of supply of labor, wages do not fall. If wages are flexible (that is they react to changes in supply and/or demand) changes in allocation will not necessarily lead to crowding out. The third necessary assumption is that both supply and demand of labor must be heterogeneous.

Then, we examine the ability of these models and theories to explain differences in the labor market positions between men and women. Only some models and theories can explain these differences when specific assumptions are made about differences between men and women. Other models and theories can not explain these differences at all.

The most common assumption used to explain differences in the labor market position of men and women is discontinuity in
women's labor market participation. Because women interrupt their labor market career more often than men, women either are thought to invest less in human capital than men (human capital theory) or they are placed behind men in the labor queue because of lower returns on job training costs (job competition model). Another assumption is that there are differences in the productivity of men and women (with men more productive than women), which makes it cheaper for employers to hire men instead of women. The ad hoc character of these assumptions is problematic. They are based on empirical evidence of earlier research and are not theory based.

In chapter 2 we examine also several models and theories specifically developed to explain differences in labor market positions of men and women. These are Becker's theory of 'a taste for discrimination', theories based on differences in economic power between several actors, and the crowding hypothesis.

Explanations developed on basis of Becker's research are not helpful in explaining differences in the labor market positions of men and women. Because of competition differences either disappear, or the labor market becomes completely segregated (where employers hire only men or only women). In the latter case wage differences between men and women are not necessary.

Explanations based on differences in economic power are also not helpful in explaining differences between men and women. Monopolists have no reason at all to differentiate between men and women, and monopsonists should pay women higher wages than men given the empirical differences in elasticities of labor supply between men and women. Besides monopsonists hardly exist.

The crowding hypothesis is unable to explain the lack of "women's" occupations. Further it remains unclear why the ratio between demand and supply is less favorable for women than men.

On basis of these results we then decided to develop an efficiency wage model of the labor market as the starting point of our explanation. In these models, the productivity of employees is dependent on wage rates. Because of this dependency, wage rates are downwardly rigid. If wages fall too much, productivity falls even more, and employers see falls in their profits, despite lower wages. Downwardly rigid wage rates make it possible to explain effects of crowding out, and with some additional assumptions, it is also possible to explain differences in labor market positions of men and women. These additional assumptions are derived from a adjusted version of Becker's household production functions which he introduced in 1965.
In chapter 3 we elaborate a model of the labor market that explains allocation, effects of crowding out and differences in labor market positions of men and women. The model is based upon relationships between employers and employees. These relations can be one of two kinds: relationships of trust or relationships of control. The kind of relation that develops depends on the difficulties employers have in measuring the productivity of their employees. If employers have difficulty measuring the productivity of the employees (the price of control is high) employers can maximize their profits by trusting their employees and by paying them relatively high wages. If employers can measure the productivity of their employees easily (the price of control is low) employers can maximize their profits instead by controlling their employees and by paying them relatively low wages. These facts lead to an efficiency wage model in which efficiency wages depend directly on the price of control, the amount of control, the level of effort of an employee, and the productive characteristics of employees.

On basis of this allocation model, we deduce the following hypothesis.

Hypothesis 1:

Because employers with the highest price of control pay the highest wages and trust employees and because employees with the highest levels of education have the lowest costs per unit product, we expect to find employees with high levels of education to be employed more often by employers with a high price of control than by employers with a low price of control.

This allocation model of the labor market is able to explain effects of crowding out. The necessary assumptions are fulfilled: both supply and demand of labor are heterogeneous, and wages cannot fall below a certain level, even when there is an abundance of labor supply. In these conditions, employers are better able to meet their preferences for higher educated employees. The probability of finding a job will especially fall for employees with the lowest levels of education. Because employers with a high price of control pay the highest wages they are especially able to hire the most productive employees. This leads to a second hypothesis.

Hypothesis 2:

The effects of crowding out will appear sooner and stronger for employers with a high price of control than for employers with a low price of control.
To explain differences between men and women in allocation in the labor market it is necessary to make several assumptions about the restrictions that men and women face. As a result the utility function of employees is modified. Instead, more general goals were formulated, arguments that move beyond wages and level of effort as explanations for the utility function. These goals include: physical well being and social approval. In addition the composition of households is taken into account. Here, a distinction is made between (a) households consisting of one member, and (b) households consisting of two or more members. The following hypothesis is formulated on basis of maximising physical well being and accounting for comparative advantages of men in providing the means for making a home.

Hypothesis 3a:

Married men hold better positions in the labor market than non-married men, and women who in their turn hold better positions than married women.

The combination of hypothesis 3a with the allocation model leads to the following hypothesis.

Hypothesis 3b:

The differences in labor market positions hold by married men, non-married men, non-married women and married women are largest among employers with a high price of control than among employers with a low price of control.

The maximization of social approval -- which consists of status, behavioral confirmation and affection -- produces a difference in labor market behavior of married women with high educational levels and those with low educational levels. Highly educated married women attach relatively more importance to aspects of job status than married women with lower levels of education. This leads to the following hypothesis.

Hypothesis 4:

Highly educated women who are married to highly educated men attach relatively more importance to job status than to wages. Highly educated women married to men with lower educational levels attach relatively more importance to
wages than to job status, as do non-married women and married women with low levels of education.

The combination of hypothesis 2, 3a and 4 leads to the following hypothesis.

**Hypothesis 5:**

The effects of crowding out will be stronger among men employed by employers with a high price of control, and non-married men will suffer more from crowding out than married men. Women, especially highly educated women married to highly educated men, will suffer less from crowding out.

In chapter 4 the datasets, methods, and variables used in this research are described. The datasets that are used in this research are the 1981 and 1985 Labor Force Censuses. Only persons who held a paid job or worked as a member of a family organization are included in these analyses. The 1981 dataset contains 24686 persons, and the 1985 dataset contains 25572 persons. For detailed descriptions of the Labor Force Censuses, see CBS (1985a) and CBS (1987).

Two statistical methods are used to test the hypotheses. First, a multinomial logit model is used to estimate the allocation of employees over employers. A multinomial logit model estimates the probability of employees to work in one of the labor market segments, after taking some of their characteristics into account. Second a logit "continuation ratio" model is used to estimate the allocation of employees over job levels within the distinguished labor market segments. A logit continuation ratio model estimates the probability of employees to achieve a certain job level, again after accounting for several employee characteristics and the labor market segment. Together these two models give the allocation of employees over all jobs. By comparing estimates at two separate moments in time it is possible to speculate about changes in the allocation of employees among employers. An extensive example is given in chapter 4. By analyzing the allocation of men and women separately, it is possible to draw conclusions about the differences in allocation between men and women.

Section 4 describes the variables and the coding of the variables that are used in the analyses. Detailed attention is paid to the coding of jobs into job levels, and to the coding of firms into segments of the labor market. These two variables are the focal points of the research. For the coding of jobs into job levels we use the scheme of Conen and Huijgen.
For the coding of job levels three criteria are used. First, time necessary for on-the-job training, second, level of independence, and third level of necessary schooling.

For the coding of segments of the labor market we use the scheme of Stinchcombe (1979). On the basis of limitations in competition in both the product market and the labor market Stinchcombe developed seven segments. On the basis of the possibility of control over labor relations, assumptions are made about the price of control. A categorization of the labor market into seven segments results with each segment differing by price of control. The other variables used in the analyses are educational level, type of education, age, marital state, sex and firm size.

In chapter 5 hypothesis 1 is tested in two different ways. First we estimate a multinomial logit model in which the probability to work in one of the seven labor market segments is used as the dependent variable. Several productive characteristics are entered into the model: educational level, type of education and age of the employees. In addition we control for non-married men, married men, non-married women, married women and firm size. The analysis shows that employees with a high educational level have the highest probability of working within professional services, which is also the segment with the highest price of control. Employees with the high educational levels have the lowest probability of working within segments with a low price of control, segments like 'classical' capitalistic industries and small competitive trade and services.

Employees with technical types of education have the highest probability of working within industrial segments, while employees with administrative types of education have a higher probability of working within bureaucratic services, and small competitive trade and services. Employees with 'caring' types of education have a higher probability of working within the professional services.

Age, although significant, has little effect on the probability of working within a particular labor market segment.

These results support hypothesis 1. Therefore we can conclude that employees who are relatively productive have a higher probability of working with employers who have a high price of control than of working with employers who have a low price of control.

Second, a logit continuation ratio model for each of the seven segments is fitted. In this model the dependent variable is the probability of achieving a higher job level. Several characteristics of employees are entered into the model: educational level, type of education, age and age squared. In addition we control for marital state, sex, and firm size.
The analysis shows that the association between educational level and job level is strongest for the professional services and weakest for small competitive trade and services. In general this association is stronger for segments that have a high price of control than for segments that have a low price of control. The results from the 1981 labor force census are more in line with hypothesis 1 than the results from the 1985 labor force census.

Where the type of education is concerned, the results are in line with the idea that for the segments where the demand for some type of education was high these types of education provide the highest probability of achieving a high job level within these segments. The only exceptions are the probability of achieving a high job level within bureaucratic services with a technical education and within 'classical' capitalistic industries with an administrative education. Both probabilities are higher than expected.

Even though the effects of age and age squared are significant within virtually every segment, the differences in effects of age and age squared between the segments are not straightforward. In 1981 there are few differences and in 1985 the differences do not support our expectations.

The results with respect to educational level, type of education, age and age squared, support hypothesis 1. Highly educated employees within segments with a high price of control have a higher probability of achieving a high job level than those within segments with a low price of control. The analysis also shows that we can better predict the job level of employees within segments with a high price of control than we can for those within segments with a low price of control. Therefore we conclude that employers with a high price of control do find indicators of employee productivity more useful than employers with a low price of control. As a result, they hire more employees with high educational levels.

Section 3 of chapter 5 shows that although a simple empirical model for the entire labor market fits reasonably well it is not possible to show differences between employers. Some of the effects that we find for the labor market as a whole cannot or can only with great difficulty be interpreted. This finding gives further empirical support to the allocation model developed in chapter 3.

In chapter 6 we test hypothesis 2 about effects of crowding out. Before hypothesis 2 was tested, we first examined whether crowding out within the entire labor market took place between 1981 and 1985. The analysis shows that, despite a regradation of the job structure (relatively more high level jobs were available in 1985 than in 1981), the probability of achieving a high job level, given a certain educational level, decreased between 1981 and 1985.
Second we analyze the differences in allocation within the segments between 1981 and 1985. The analysis shows that crowding out did not take place within every segment. For two segments -- small competitive trade and services, and bureaucratic services -- the probability of achieving a high job level, given a certain educational level, actually increased between 1981 and 1985. Crowding out did not take place within these two segments, while an upwardly directed substitution process had been happening.

However, we do find effects of crowding out within three segments: 'classical' capitalistic industries, large scale bureaucratic industries, and professional services. Within the 'classical' capitalistic industries crowding out results from the degradation of the job structure. Within the large scale bureaucratic industries, all employees are effected similarly by the crowding out process. Within professional services employees who work in low level jobs are most affected by the crowding out process.

Within two segments -- traditional primary industries, and competitive industries with schooled employees -- no differences are found in the probability of achieving a high job level between 1981 and 1985.

By and large these results support hypothesis 2. A change in the selection of personnel did take place, and especially for segments with a high price of control. The one exception to this trend is for bureaucratic services where contrary to our expectations the probability of achieving a high job level actually increased.

In chapter 7 hypotheses 3a, 3b, 4 and 5 are tested. These hypotheses are tested in different steps. In the first step hypotheses 3a and 4 are tested. Separate models of allocation over job levels are tested for men and women and their outcomes are compared. Then, an interaction between marital state and educational level was added. This interaction is added to the original empirical model in order to test hypothesis 4. For both men and women a positive effect of the interaction is expected. On basis of hypothesis 3a, it is expected that married men have a better position in the labor than non-married men, and will therefore benefit more from their educational level. On basis of hypothesis 4 a positive interaction effect is expected for women. This positive effect will result when highly educated women marry highly educated men more often than they marry men with lower educational levels. According to Dessens, Jansen and Ultee (1990) dutch women marry men who have a slightly higher educational level.

The results of the analysis show the same effects for the variables as the original analysis with men and women together.

Hypothesis 4 is fully supported by the results. Highly educated married women benefit more from their educational
level than lowly educated married women and non-married women. Hypothesis 3a is only partially supported. Lowly educated women have a smaller probability of achieving a high job level than lowly educated men, but highly educated women have at least the same probability of achieving a high job level as highly educated men.

In the second step of the analysis hypothesis 3b is tested. Separate models are again estimated for men and women for each of the seven segments. In this step, the same variables are entered into the empirical model as in the first step. For men, the results here are comparable to those for men and women together. The results show few differences between the allocation of married and non-married men. This is contrary to hypothesis 3b.

For women, this model reveals even fewer differences in allocation between the segments than the model for men. The differences are in the direction of our expectations. In addition hypothesis 4 is supported by this analysis. It shows that married women benefit more from their educational level than non-married women, and this is especially so for women within bureaucratic services and professional services. Hypothesis 3b is partially confirmed in this analysis as well. The differences between non-married and married lowly educated women are bigger for those segments with a high price of control than for those segments with a low price of control. These differences are larger in 1981 than in 1985.

With respect to the differences in allocation between men and women within segments, hypothesis 3b is contradicted. We find differences in allocation between men and women, and these differences depend on the segment in which men and women work. However these differences are not related to the price of control of the segments. For instance, men have a higher probability of achieving a high job level than women both for segments with a low price of control (e.g. 'classical' capitalistic industries) and for segments with a high price of control (e.g. professional services). However women have a higher probability of achieving a high job level than men within the small competitive trade and services (a segment with a low price of control), and within large scale bureaucratic industries (a segment with a high price of control).

The lack of support for hypothesis 3b is partially due to hypothesis 4. We hypothesize that highly educated married women who work within professional services or bureaucratic services will value job status more than non-married women and lowly educated married women. Therefore it is to be expected that highly educated women are more likely to stop working completely if they cannot find a job with enough status. This effect is contrary to hypothesis 3b. As a result, the lack of support for hypothesis 3b gives no reason to reject this aspect of the allocation model yet.
In the third and final step of the analysis hypothesis 5 is tested. As in chapter 6 we first examine whether crowding out occurred in the entire labor market for men as well as for women.

While crowding out seems to have occurred for both men and women, the effect is different. According to hypothesis 5, crowding out is more extreme for men than for women. The probability of achieving a high job level, given a certain educational level, decreased more for men than for women.

Separate analyses for each segment show that changes in the allocation of men and women between 1981 and 1985 is especially apparent for segments with a high price of control. In addition crowding out appears to be more extensive for men than for women. These results support hypothesis 5. Also in line with hypothesis 5 is the finding that there were no differences in effects of crowding out between married and non-married women. However, contrary to hypothesis 5 there appear to be no differences in effects of crowding out between married and non-married men.

In addition to crowding out, we also find some proof for upwardly directed substitution. Substitution mainly appears within segments with a low price of control.

(English corrected by Dr. R. Settersten)