

Chapter 7

Hedonic Wage Analysis

7.1 Introduction

For at least two hundred years, economists have argued that a competitive labor market will generate higher wages in return for less desirable working conditions, such as hazardous conditions or poorer on-the-job amenities. This expectation has led to the development of the theory of compensating wage differentials and the estimation of hedonic wage models, the second type of hedonic model that has engaged environmental economists. In this chapter we investigate how wage differentials have been employed in valuing changes in environmental amenities.

We consider the hedonic wage model in a separate chapter because its literature differs significantly from the hedonic housing model. Further, as we explain below, empirical evidence based on hedonic wage equations provides substantial support for the benefits of the Clean Air Act, yet this evidence remains controversial. Because of the inordinate leverage of estimates from hedonic wage models, we explore the estimation process and data sources to a much greater extent than for other methods.

Differences arise between property and wage hedonic models for several reasons. For one thing, property is a durable asset and jobs are not. In the housing market, resales of already produced homes dominate the market, leaving the role of the producer of houses as largely peripheral to the analysis. In the job market, the decisions of firms that supply jobs are potentially as important in sorting out the underlying hedonic story as the decisions of those who seek employment. A second difference is that the wage schedule a worker faces depends on the characteristics of the job and the characteristics of the worker. A given worker's productivity in a job will be determined in part by

his/her education and experience. Hence the wage schedule can be expected to differ among individuals in different skill groups. Indeed some workers simply will not be qualified for some jobs.¹ The importance of these two features will become clear as we discuss the assumptions generally made in estimating the hedonic wage model.

Hedonic wage analysis has played a role in two different environmental valuation literatures. The first has to do with valuing workplace amenities. In theory it should be possible to use hedonic wage analysis to value exogenous changes in these job attributes, but empirical evidence of compensating wage differentials has been difficult to uncover. In practice, the amenity that has received almost all the attention is workplace safety. As we will see, the value of safety is estimated in the context of the labor market with the purpose of inferring the value of reducing risk in other, often environmentally-induced, health risk settings.

The second type of application of hedonic wage analysis is quite different and is really an extension of the hedonic property analysis. Most property value studies have considered price variation along an amenity gradient within a metropolitan housing market. When the public good of interest varies only across broad regions but not within metropolitan areas, intercity wage variation has seemed intuitively to provide a better, or at least additional, source of information about preferences. Climate variations clearly fall into this category. Recent applications have attempted to measure the effect of climate amenities and disamenities on wages, spawned by the increased interest in global warming and climate change.

Because the underlying modeling issues are very different in these two wage hedonic settings, we develop the analytical models separately, beginning with the valuation of workplace amenities.

7.2 Hedonic Wages in Theory

The setting is a market in which workers have preferences for job amenities and firms supply those amenities and hire workers in making production decisions. Firms differ in the costs of providing the amenities and workers differ in their preferences for the amenities. These amenities could be any non-wage attributes of the job, such as the level of comfort (perhaps in terms of temperature control) of the work place, the existence and quality of on-site child care facilities, or the level of workplace safety. As in Chapter 6, attributes are

¹It is possible that a similar situation could arise in a housing market if there existed 'red-lining' or other severe forms of discrimination based on race, ethnicity, age or other characteristics of potential buyers.