The Nature of Pluralism in Economics: A Case Study of the Gender Wage Gap

by

Alexandra Kraushaar

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Philosophy

Waterloo, Ontario, Canada, 2015

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Understanding and measuring a socially relevant and complex phenomenon like the gender wage gap requires a thorough understanding of the causal factors arising in the real world. This thesis investigates the Marxist and neoclassical theoretical models of the gender wage gap and considers the nature of pluralism within different approaches to measuring this phenomenon. I analyze the Oaxaca and the Karamessini & Ioakimoglou decomposition methods, where various algorithms and regressions are used to decompose the problem of the gender wage gap into sub-problems. I further consider how monism and pluralism have been coming in and out of fashion in economics over the course of the 20th century and well into the 21st century – where pluralism seems to be on the rise and is a contentious topic of discussion in mainstream economics. The analysis in this thesis illuminates two kinds of pluralism arising with respect to methodological approaches that different theoretical traditions use to understand the wage gap. I conclude that both kinds of pluralism, modest and empirical pluralism, are necessary for furthering our understanding of this complex phenomenon and benefit the insight we gain from the various decomposition analyses of the wage gap in the real world.

Acknowledgements

I would like to sincerely thank Carla Fehr for supervising this project. I am extremely grateful for her endless guidance, support, and vision throughout the entirety of this project and throughout my degree. I am very appreciative of being included in Carla's research interests, and recognize her provision of endless resources of knowledge to my many questions and introducing me to feminist philosophy of science and socially relevant philosophy.

I would also like to sincerely thank Patricia Marino for her mentorship, guidance, and support of this project. I owe credit to Patricia for supporting me through the entirety of my degree and offering me the inspiration and insight I needed to engage in Philosophy of Economics.

I would also like to sincerely thank Paul Thagard for taking the time to review this project. His many helpful comments and suggestions helped to improve the aims and quality of this project.

Table of Contents

List of Figures

Introduction

Throughout the 20th century, monism and pluralism have been in and out of fashion in the mainstream of the discipline amongst economics scholars, students and professionals alike. Topics relating to epistemology of economics, history of economic thought, feminist economics and pragmatism are all circulating in the discussions of those who identify with the pluralist movement in economics (Garnett, Olson, and Star, 2010). With a growing dissatisfaction in the way current mainstream economics prepares young scholars to handle real world problems and fails to prevent devastating crises, economic scholars, professionals, and students started to pay more attention to the voices and claims coming from those in the margins or periphery of the discipline. Problems about neoclassical economics and the dominant monism of the mainstream continue to be voiced by those refusing to conform, who are advocating for alternative theories and broader approaches to real world problems.

Students across the globe have also been working hard to advocate for changes in the discipline, starting with curriculum. The discontentment with mainstream economics concerns a lack of attention to three kinds of pluralism: theoretical, conceptual, and disciplinary (PEPS-Economie & Jatteau, 2014). Student movements such as International Student Initiative for Pluralist Economics and Rethinking Economics were formed to give a platform for students to have a voice. Both of these student movements have grown worldwide, bringing students together from around the world who all advocate for changes to the economics curriculum.

Given the discontentment amongst some of the people in the discipline over the monistic characteristics of mainstream economics, there has been a growing push toward increasing

pluralism within and about the economics discipline. However, such a movement leads to an important question: What is the nature of pluralism in economics? In this thesis, I will look at this question in more detail by exploring the monist-pluralist debate about science and economics and investigating whether there is a fruitful kind of pluralism within economics. In order to look at pluralism about economics, I will investigate a case study, which compares Marxist and neoclassical theories of the gender wage gap. In Chapter 1, I introduce the monism and pluralism debates in science and economics, followed by the Marxist and neoclassical models of the gender wage gap in Chapter 2. In Chapter 3 I discuss the kinds of pluralism the case study is consistent with, and conclude that at least two kinds of pluralism exist in the case study of the gender wage gap and both are useful to economic inquiry into this phenomenon. This project contributes to both philosophical and economic scholarly literature on pluralism. It contributes to philosophy by providing a case in which multiple kinds of pluralism contribute to researchers' understanding of an economic phenomenon. It contributes to economics by illuminating how my interpretation of multiple kinds of pluralism help to make sense of, direct, and improve investigation into complex economic phenomenon.

Chapter 1

Monist – Pluralist Debate about Science and Economics

This chapter focuses on monism and pluralism about science and economics, while first developing an understanding of what theories and models are in mainstream economics. Gaining an understanding of the role theories and models have in economics will aid my investigation later when I look at theories and models about the gender wage gap in Chapter 2. The chapter ends with a discussion of monism and pluralism about science and economics, respectively.

1.1 Theories and Models in Economics

In this section I will focus on theories and model in economics, in order to gain a better understanding of what the characteristics of economic theories and models are. When considering theories and models in this thesis, what is of interest is the relationship between mathematical models and their corresponding economic theories. The main characteristics of theories in economics includes: being reductionist, individualistic, and idealized. Furthermore, theories are developed by using methodological individualism, which I take to mean methods and explanations focused on individual actors.

In Chapter 2 I look closely at the theory of labor market discrimination from two theoretical frameworks, neoclassical and Marxist. The neoclassical theory of discrimination claims that labor market discrimination exists "if individual workers who have identical productive characteristics are treated differently because of the demographic group which they belong" (Ehrenberg & Smith, 418). This theory is focused more closely on wage

discrimination where two equally productive and skilled workers are paid different wages. Here I can isolate for gender to understand how gender impacts wage discrimination. The neoclassical theory of discrimination is reflected in mathematical models. In Chapter 2 I look at two models, Becker and Oaxaca, both of which utilize the neoclassical theoretical tradition.

On the other hand, the Marxist theory of discrimination claims wage discrimination is "unequal pay for work of equal value (unequal remuneration in the same job) and unequal pay for work of equal value (low valuation of jobs that women do)" (Karamessini & Ioakimoglou, 34). Additionally, the theory that "gender discrimination is incorporated in the wage structure through both individual and employer wage-setting practices and collective bargaining," while wage discrimination is "embedded in the whole institutional context governing wage formation" (34-35). This theory is different from the neoclassical theory because of where wage discrimination seems to be originating. I will look at this theory and its corresponding mathematical models and compare it to the neoclassical theory and models to understand the nature of pluralism arising when these models are considered together. Before I dive into this however, I will first look at the nature of models in economics.

In terms of modeling in economics, there are two model-based strategies used. Morgan and Knuuttila (2012) describe the nature of economic models and their roles in economic inquiry, while specifying the different roles models play in macro and microeconomics:

> Core micro-economic theory has been axiomatized and economists use sophisticated mathematical methods in modelling economic phenomena. Macroeconomics relies in turn more on purpose-built models, often devised for policy advice. (50)

4

Understanding the differences between micro and macroeconomic models is important to my discussion here because in the case study microeconomic neoclassical models about the gender wage gap are being compared to a macroeconomic Marxist model. Microeconomics refers to the part of economics concerned with single factors and individual decisions, whereas macroeconomics refers to large scale, general factors. What is important to understand about the nature of microeconomic theory is that it is built on axioms or rules/principles that are accepted as true. Thus, microeconomic models reflect these truth claims. Macroeconomic theories on the other hand are purpose-built, where they are intended to explain a particular purpose. Thus, macroeconomic models are intended and designed for particular use.

In order to achieve different aims, economists have adopted two different epistemic positions, which are reflected in their choice of theories and models. Looking at the models, some are idealized and are "seen to make use of stylized, simplifying, and even distorting assumptions as regards the real economies in their modelling activities" (51). On the other hand, some models are constructions with "representational status" or they can be considered "fictional or artificial entities" (51). For use in economics, models are often idealized in order to isolate and measure causal factors of a particular target phenomenon (52 – 54). In Chapter 2 I look closely at neoclassical and Marxist models, which are idealized in order to measure and understand the causal factors of the gender wage gap.

To further understand the explanatory role that theories and models have in economics, I look to philosopher Harold Kincaid (2012), who offers an account of what mainstream

economic modelling requires for explanatory power. He claims that models have explanatory power if they can incorporate the following five criteria: 1) the model offers insight, 2) the model unifies (different phenomena can be captured by the same model), 3) the model serves as an instrument – we can do things with them, 4) the model is isomorphic to phenomena of interest, and 5) the model fits the entire phenomena within it (146). Kincaid suggests that "insight" is vague, however if the model gives us "insight" to a particular causal factor then it is useful (147). Secondly, for unification to exist, that would require the model show "the same causal process is behind different phenomena" (147). Third, for a model to be an instrument it needs to be useful for us to describe the real causes of particular phenomena. Fourth, being isomorphic to the real world means that the causal factors in the model also operate in the real world, thus the model can explain the phenomena as it exists in the real world. And finally, the model is useful for explaining if can fit the phenomena, as it's understood in the real world, into the model itself – this goes well with number four. These criteria are something that I keep in mind as I investigate the models of the gender wage gap more closely, although I don't set these criteria as necessary for the models to explain the phenomenon of the gender wage gap. In Chapter 3 I demonstrate that a group of models used together, as one explanatory approach to the phenomenon, are more likely to meet these criteria and thus improve the explanation and understanding of the phenomenon. Before I get into the actual assessment and discussion about the models however, I will take a look at the nature and approach to inquiry within the discipline by looking at the debate about monism and pluralism within science and economics.

1.2 Monism and Pluralism within Philosophy of Science

In this section, I will focus on monism and pluralism as described in philosophy of science literature. The main source for this discussion is *Scientific Pluralism* by Kellert, Longino, and Waters (2006) (hereafter Kellert et al.), which discusses a general account of monism and pluralism within a variety of scientific disciplines. To start, I will look briefly at monism. There are particular tenets held by the scientific monist view, as specified by Kellert et al.:

1. The ultimate aim of science is to establish a single, complete, and comprehensive account of the natural (or the part of the world investigated by the sciences) based on a single set of fundamental principles;
2. The nature of the world is such that it can, at least in principle be completely described or explained by such an account;
3. There exist, at least in principle, methods of inquiry that if correctly pursued will yield such an account;
4. Methods of inquiry are to be accepted on the basis of whether they can yield such an account; and
5. Individual theories and models in science are to be evaluated in large part on the basis of whether they provide (or come close to providing) a comprehensive and complete account based on fundamental principles. (*x*)

These tenets act as ideals to which the monist research agenda aspires. For now, I won't discuss monism in more detail regarding science generally; however, I will return to monism with regard to economics in a later section in this chapter.

As an alternative to monism about science, pluralism is offered. There are three main categories of pluralism within the philosophy of science as described by Kellert et al.

including: modest, radical, and empirically based pluralist approaches. I will discuss each of these in turn.

1.2.1 Modest Scientific Pluralism

Modest pluralism advocates for the possibility that it could be necessary to have more than one model or theory to explain a phenomenon given the context of inquiry. Sandra Mitchell (2002) and Philip Kitcher (2001) are identified by Kellert et al. as proponents of modest pluralism.[1]

Sandra Mitchell argues for "an integrative model in understanding pluralism" (2002), as an alternative to competitive and compatible pluralism (56). Competitive pluralism is the view that multiple theories or explanations for a phenomenon can co-exist for a time, but that ideally this plurality will resolve itself into monism. According to this view the pursuit of competing hypothesis can accelerate scientific progress, as well as function to maintain "multiple, competing theories and explanations … in order to hedge its bets against empirical uncertainty" (56). The aim of such competitive pluralism is to find the ultimate theory or explanation that will eventually empirically win out over the competition (56). As stated by Mitchell, "These accounts of competitive pluralism presume that pluralism is temporary and strategic, but ultimately eliminable" (56). Compatible pluralism is described as a pluralism arising from a difference in the "levels of analysis," such that "questions at different levels require different answers" (57). However, Mitchell does recognize some shortcomings of

---

[1] It is noteworthy to mention that Kellert et al. developed the modest pluralism account after Mitchell and Kitcher developed their own accounts / methods. Thus, Mitchell and Kitcher did not self-identify as proponents of modest pluralism but rather Kellert et al. identified their positions as aligning well to what they call modest pluralism.

compatible pluralism as it fails to capture the relationship between different or alternative explanations. In order to reconcile both competitive and compatible pluralism, Mitchell defends integrative pluralism, where "pluralism with respect to models can and should coexist with integration in the generation of explanations" (68). I understand this to mean that pluralism is simply using a variety of models together or integrating a variety of models into the explanation of the phenomenon.

Similar to Mitchell, Philip Kitcher (2001) argues that pluralism results in variations in theories or explanations of the same phenomena. From this perspective, there can exist "different theories about one and the same phenomena," and further, "all truths in one theory of X must be translatable into truths in the other theories of X" (Kellert et al., *xii*). Specifically, Kitcher is claiming that you can have different theoretical models, each considered true, to explain the same phenomenon. However, the criterion here is that what is considered to be true in one model about the phenomenon must be considered true in the alternative model about the phenomenon. For example, model A considered Z to be true about phenomenon X, and model B considers Z to be true about phenomenon X, and model C etc., while model A, B, and C etc. all offer an explanation of phenomenon X. What I consider to be important here is that in order for the models to hold the same truths about a phenomenon, they must be developed within the same theoretical tradition. I look closer at this in Chapter 3, where I see this type of pluralism arising when I look at different models in the neoclassical tradition.

Although I've expressed the usefulness of pluralism through Mitchell and Kitcher's accounts, Kellert et al. raise concerns about this approach to pluralism as it "sometimes leads philosophers to three errors" (*xii*):

1. To minimize or overlook important differences among scientific approaches.
2. To dismiss from consideration legitimate scientific approaches that seem to lie outside the mainstream.
3. To exaggerate the explanatory importance of scientific approaches that are in the mainstream. (*xii*)

Modest pluralism can lead to problems in one or all of these three areas. This concern motivates a stronger pluralist stance. I will continue to explore the consequences of this pluralism in Chapter 3 of this thesis.

1.2.2 Radical Scientific Pluralism

The second kind of pluralism about science is the radical pluralist interpretation, a much more extreme approach to pluralism within scientific inquiry, as made apparent by its name. Kellert et al. do not discuss this perspective in as much detail which is probably due to it having fewer proponents within the philosophy of science. This form of pluralism falls largely into the realist domain of scientific inquiry, where "there are an indefinite number of ways of individuating and classifying the objects in the world, each of which is responsive to different interests, and none of which is more correct than the others" (*xiii*). This view's main proponent is philosopher John Dupré (1993). Dupré has coined his view as "promiscuous realism," however according to Kellert et al. this view is "hard to distinguish from radical relativism" (*xiii*). This view could be problematic because it removes any and all constraints

on the variety of acceptable explanations or theories of phenomena. Further, the radical

pluralist interpretation is the most extreme view of pluralism that could be adopted within

philosophy of science, so say Kellert et al.

1.2.3 Empirically Based Scientific Pluralist Stance

The final pluralist interpretation to be discussed is the empirically based pluralist stance. This

form of pluralism is empirically motivated and argues, "The nature of the world is such that

its parts can be completely described or explained by a comprehensive account grounded on

a consistent set of fundamental principles" (Kellert et al., *xiii*). Simply put, when we go out

into the world and try to explain the phenomena we aim to understand, we require a plurality

of explanations to do so. Kellert et al. claim that empirical investigation is required to know

which accounts of phenomena require pluralist approaches. This means that we must

investigate or have some level of comprehension of the phenomena in the real world to fully

acknowledge that empirical pluralism is the appropriate approach to inquiry of those

phenomena. If empirical pluralism is the approach taken to understand a particular

phenomenon, there are advantages to this pluralist stance including: providing a means of

avoiding conflicts hindering progress; emphasizing the partiality of scientific knowledge; and

being clear that "scientific inquiry typically represents some aspects of the world well at the

cost of obscuring, or perhaps even distorting, other aspects" (*xiv*). What is essential to my

investigation into the wage gap is the advantage of emphasizing the partiality of scientific

knowledge that the empirical pluralist approach provides. In Chapter 3 I will look closely at

11

this advantage and the consequences of empirical pluralism with respect to the gender wage gap.

The empirical pluralist stance actually goes further to reject monism and fundamentalism with respect to representation,

> All representations are partial in that any representation must select a limited number of aspects of a phenomenon (else it would not represent, but duplicate). This selective and partial character of representation means that alternative representations of a phenomenon can be equally correct … The plurality of representations and approaches in science is sustained by the complexity of nature, the employment of highly abstract representational models, and the diversity of investigative, representational, and technological goals (*xv*).

This approach respects the complexity of the phenomenon and employs many models to represent multiple aspects of the phenomenon, without the expectation that one model does so in an all-encompassing way, as monism would have it.

Kellert et al. discuss a number of ways in which an area of inquiry can be characterized through an empirical pluralist approach. The characteristics of empirical pluralism include its ability to attend to the following considerations: (a) the complexity of the phenomena – whether associated with crossing levels of organization or multiple factors within the same level of organization; (b) the variety of explanatory interests; (c) the openness of constraints – whether from above or below; and (d) the limitations of particular explanatory strategies

vis-à-vis phenomena (*xiii –xv*).[2] This kind of pluralism is able to accommodate ontological complexity of the phenomena in question; further asserting the idea that monism fails to account for such complexities at some level.

The next section will proved an introduction to the monism-pluralism debate in economics, while presenting a detailed description of the main school of thought and the current environment of mainstream economics.

1.3 Monism – Pluralism Debate within Economics Literature

The monism – pluralism debate has been an ongoing topic in economics through the 20th century. Current mainstream economics supports neoclassical economics as the dominant theoretical approach, which itself exemplifies monism. However, this has not always been the case in economics. Pluralism has also been dominant in the mainstream at times in recent history. Economist Esther-Mirjam Sent (2006) describes the changes throughout the history of the discipline and how monism and pluralism have come in and out of fashion over time. Sent portrays how neoclassical economics, a theoretical tradition founded in methodological individualism, preference maximizing, market equilibrium and based on supply and demand, has become the dominant school of thought within the economics discipline as of late. Sent criticizes the current discourse in mainstream economics as being consistent with monism, as I have discussed it in the previous section. As the discipline of economics narrowed its methodologies and boundaries of accepted approaches, monism surfaced alongside the rise of neoclassical economics as the most highly accepted method to economic inquiry. This shift

---

[2] I have listed the ways myself, whereas Kellert et al. discuss these ways extensively throughout the specified pages.

towards monism can be interpreted as a dominant trend towards monism within the discipline.

Monism in economics is recognized by its aim to secure a single theory within economics, along with increased use of formalized mathematics and statistical tools. Heterodox economist Frederic Lee (2010) notes that monism necessitates that one particular approach be considered superior to others and all other approaches should be reduced to that one particular approach (22). Furthermore, Lee describes the monism movement as being characterized by the rise of the neoclassical school of thought and reduction of alternative methods and a reduction of the available tools, models, and theories to those that support the beliefs and value systems embedded in the neoclassical tradition (22). The narrowing of the discipline describes the change in the discipline from being consistent with pluralism to becoming increasingly consistent with monism. Specifically, at one point many schools of thought were considered dominant in the mainstream such as neoclassical, Marxist, and institutional, whereas now the discipline is dominated by the neoclassical school of thought and relatively little research is being done in other schools of thought. Furthermore, the continual formalism of neoclassical economics caused other theories and schools of thought, such as Marxist or institutional economics, which are alternative theoretical traditions, to be pushed out of the mainstream discourse, further contributing to a narrowing the discourse and research goals in economics (Sent, 82). In the next section, I will go into detail about the neoclassical school of thought to aid in our understanding of mainstream.

1.3.1 Neoclassical Economics

To understand a little more about the dominant discourse within economics today, I would like to go into detail about the neoclassical school of thought. Generally, neoclassical economics focuses on individuals, market equilibrium, and the use of mathematical modeling and methods applied to economic questions. Theoretical models in neoclassical economics are largely based on methodological individuals, preference maximization, and market equilibrium. Methodological individualism here means that methods and explanations are focused on individual actors. Such individual actors are preference maximizing, meaning that given their preferences they will always choose the option that maximizes their utility or whichever preference they prefer the most. In order to maximize preferences, neoclassical models "assume the independence and autonomy of each person's utility function" (Saunders & Darity, 105). Finally, the markets are assumed to adjust until equilibrium state is achieved, this means, for example, and that the price for good X will adjust until the supply of good X equals the demand for good X.

Some critics of the neoclassical school of thought argue that the focus on individual interactions within neoclassical economics, preclude it from investigating social issues beyond those that can be aggregated from the sum of individuals (Sent, 84). Such criticism highlights some of the important traits within the neoclassical school of thought that underlie the theories and models considered to be true about economic phenomena. It is possible for critics to consider the characteristics mentioned previously as catalysts to the monist theoretical and methodological approach to economic inquiry within mainstream economics

today, according to monist critics (Garnett, Olson, and Star (2010); Sent (2006); England (2003); to name a few presented here).

A common theoretical tool that is used in neoclassical economics and is based on methodological individualism is Pareto-efficiency (or Pareto-optimality). Pareto-optimality occurs when individuals voluntarily exchange goods or services to achieve being better off. When the two individuals reach a point where any further exchanges would result in one party losing utility (or being worse off), the distribution is Pareto-optimal (England, 40-41). For example, "redistribution requiring some affluent persons to lose utility for the sake of a gain by the poor cannot be Pareto-superior by definition" (England, 41). In laymen's terms, if you were an affluent and altruistic individual and decided to give money to someone less affluent than you, i.e. you are exchanging at a cost to you with no monetary benefit (no utility increase or personal gain on your part), this means you forego the utility you could gain in an alternative exchange. Thus, this exchange is not considered to achieve a Pareto-optimal state because a different exchange could have resulted in increased utility for you. This is one example of how the tools utilized by neoclassical demand theories in microeconomics are focused on self-interested individuals, not concerned with the altruistic social relations or connections between individuals. From the Pareto criterion perspective, "the social is not different from the individual" (Sent, 85). Generally, the stress on individualism as presented by mainstream neoclassical microeconomic theories can be understood as continuing to drive monism within the discipline. Now with a more clear understanding now of the neoclassical

school of thought, I would like to talk next about some other characteristics of the discourse in mainstream economics.

1.4 Heterodoxy and Anti-pluralist Movement

As the neoclassical dominance in the mainstream continued to drive the emergence of monism, an anti-pluralist movement also emerged (Lee 2010). This anti-pluralist movement established unequal engagement by scholars in economics, where most were studying neoclassical economics and few were engaging in heterodox economics, which is simply the study of economics outside of the mainstream or beyond neoclassical economics.   This asymmetry can be seen in the methods, tools, theories, and research programs that scholars engage in, which are dominated by neoclassical economics more than any other school of thought. Economist David Colander (2010) criticizes this asymmetry and claims it results in significant limitations of the knowledge being produced within economics, including the methods and scope of economic inquiry (37). Moreover, Colander comments on how mainstream economics is highly restrictive in the ideas and voices that are part of the conversation, "To enter the mainstream conversation, models and econometrics have to be blended in just the right way to convince the mainstream profession that the author has something to add" (41). This is an important aspect of the mainstream discourse because in order to enter the conversation and have a voice, one must adopt the methods and tools used in the mainstream discourse and speak the language of mainstream, neoclassical economists, as argued by Colander. These limited conversations and voices contribute to the monistic and asymmetric characteristics of mainstream economics.

Alongside the movement for monism of theories and methods, there have been other schools of thought that have emerged in the mainstream in more recent years, leading to a heterodox discourse in economics. Heterodox economists aim to work with alternatives to neoclassical economics, while maintaining a voice in the mainstream debates (Colander, 37). Heterodoxy in the mainstream might lead one to think that the mainstream is already pluralistic; however this interpretation would be a mistake because though the mainstream is heterodox, it is still dominated by neoclassical theories, methods, and knowledge production. This dominance creates boundaries within the discipline resulting in the neoclassical school of thought governing the "preconceptions, approved methods, priorities – all the components of an independent research program – that taken together, structure the way particular economists approach their subject of inquiry," according to economists William Waller (2010, 57). The boundaries could also actually inhibit practitioners to view work that is produced outside of their disciplinary boundary, which could be the boundary between neoclassical and non-neoclassical economics. In response to these boundaries, anti-pluralism, and monism, which permeates mainstream economics, critics, including some heterodox economists, call for pluralism in economic theories and methods (36). This pluralism however, goes beyond generally adopting heterodox economics in the mainstream, it addresses the boundaries and rules that govern the discipline. The next section will provide an overview of the pluralism debate about economics and in Chapter 3 I will focus on the different kinds of pluralism about economics in more detail.

1.5 Pluralism about Economics

As mentioned in the last section, both monism and pluralism have come in and out of fashion in the economics discipline (Garnett, Olson, and Star 2010). In this section I will now switch the focus from monism to pluralism within economics. Garnett, Olson, and Star (2010) describe the more recent (20th Century) emergences of pluralism as a first-wave of pluralism and a second-wave of pluralism.

The first-wave of pluralism existed within the discipline during the 1920s and 1930s (Garnett, Olson, and Star, 1). During this time, the kind of pluralist environment within the discipline allowed economists to "hold a number of different economic beliefs and to do economics in many different ways without being out of place or necessarily forfeiting the respect of one's peers" (1). This means that economists could theorize and model a particular phenomenon through a variety of theoretical traditions, while not losing respect from peers or lacking in critical engagement with the discipline. However, this pluralist environment did not persist after World War II. The postwar environment within the discipline was characterized by an ascendant scientific monism, spearheaded by postwar U.S. economics (1). Regardless, there were dissenters within the discipline pushing against monism. According to Garnett, Olson, and Star such dissenters were,

> […] monist in their pursuit of stand-alone alternatives to mainstream theory. Yet they were also pluralist in one important sense. Against the grain of modernist unity-of-science movement, they sought to make truth and method contestable in economic inquiry. (2)

It appears to be the case that the dissent from monism aims to develop alternatives to neoclassical theories and models, while valuing critical debate amongst these many theories and models, as presented by Garnett, Olson, and Star.

Following this, a second-wave of pluralism emerged in the 1990s. These pluralists were pushing against the "notion of science as empire building or pragmatic one-upmanship" which existed among monists (2). This second-wave is largely motivated by the idea that there is no possibility for any particular theoretical tradition to "possess final or total solutions" (4). Garnett, Olson, and Star mention the rising tension between the monist and pluralist ideals, which motivate scientific progress in the discipline. Within this tension there are many questions that arise about the current discourse in the mainstream:

> […] Are mainstream economists becoming more pluralist? Are heterodox economists as pluralistic as they claim to be? […] Should non-mainstream economists seek to produce 'a single correct alternative to neoclassical economics' or should they pursue pluralist objectives? Is scientific progress enhanced or retarded when individual scholars abide by pluralist norms? (4)

These questions all seem relevant and important to the discipline of economics and methodological approach inquirers adopt.

There are many ways that philosophy of science and economics can contribute to the debate about pluralism in economics. Given the general understanding of theories and models in mainstream economics and the monism-pluralism debate about science and

20

economics, we can now look to the main question governing our investigation in this thesis: What is the nature of pluralism in economics?

In order to address this question I will focus closely on one particular economic case study: the gender wage gap. In the next chapter I will introduce the mainstream theory that dominates inquiry of the gender wage gap, labor market discrimination. I will then present two neoclassical models for understanding and measuring the gender wage gap, which are associated with the neoclassical theoretical tradition of measuring labor market discrimination. Next I introduce another theoretical model, which aims to understand and measure the gender wage gap according to the Marxist theoretical tradition about labor market discrimination. Finally, I discuss and analyze the empirical results from the neoclassical and the Marxist models.

Chapter 2
Case Study: The Gender Wage Gap

This chapter introduces and discusses the main theory used in mainstream economics to understand the gender wage gap: labor market discrimination. After a brief conceptualization of this theory, I will present three models used to further understand and measure the gender wage gap. The first two models are neoclassical and the third model is feminist and Marxist.

2.1 Labor Market Discrimination

When considering the gender wage gap, the dominant discourse used to describe and predict its behavior is that of labor market discrimination. The gender wage gap has been largely theorized as a result of discrimination within the labor market (Cain, 1986). Within the economics literature there are three schools of thought regarding theories of discrimination, including neoclassical, Marxist and institutional. Theories of labor market discrimination are further specified as either demand theories or supply theories. In this chapter I focus on neoclassical and Marxist, demand-side theories.

In his survey of labor market discrimination theories and models, Glen Cain (1986) presents conceptual definitions of discrimination as used in economics. According to Cain, discrimination is both a practical and a theoretical problem (694 -695). On the practical side discrimination is:

> [T]he wide disparity in income, earnings, and wage rates among a variety of demographic groups, classified by sex, race, ethnicity, and other characteristics. The disparities are systematic, persistent, and considered by most observers to be

inequitable, although the definitions and sources of the inequities are often controversial. (694)

The practical problem of discrimination is often understood through observation and the quantification of discrimination in the economy. This side of discrimination is often what the public or layperson is most concerned about (694).

The theoretical problem with discrimination is motivated by the question, "Under what conditions will essentially identical goods have different prices in competitive markets?" (695). When considering this question with respect to economic discrimination, Cain suggests, "Economic discrimination refers to a group rather than to an individual, and it is of greater concern as it persists over time" (695). Specifically, for our discussion here, the individual workers are men and women and our unit for measuring discrimination is wage rates and earnings (696). Now I will look more closely at the neoclassical and Marxist models, respectively, which attempt to better understand and measure the gender wage gap and its sources.

2.2 Neoclassical Approach to Labor Market Discrimination

Within the neoclassical paradigm, labor market discrimination "is said to currently exist if individual workers who have identical productive characteristics are treated differently because of the demographic groups which they belong" (Ehrenberg & Smith, 418). There are typically two forms of discrimination, wage and occupational. Wage discrimination describes situations in which women have the same experience and are in the same occupation but are paid a lower wage than men. Occupational discrimination describes situations in which

women with the same education and productive capacities are forced into lower-paying jobs than men. In order to understand how labor market discrimination can create or sustain the gender wage gap, the focus in economics is largely on measuring and modelling wage discrimination. Ehrenberg & Smith (1997) suggest "wage discrimination could be identified and measured in the following four-step process" (422):

1. We would collect data, for men and women separately, on *all* human capital and other characteristics that are theoretically relevant to the determination of earnings […]
2. We would then estimate (statistically) how each of these characteristics contributes to the earning of women. That is, we would use statistical techniques to estimate "payoffs" to women associated with each characteristic.
3. […] we would next estimate how much women *would* earn *if* their productive characteristics were exactly the same as those of men. This would be done by applying payoffs *women* receive for each productive characteristic to the average level of those characteristics possessed by *men.*
4. Finally, we would calculate the *hypothetical* average earnings level calculated for women (step 3) with the *actual* average earnings of men. This latter comparison would yield an estimate of the different prices for productive characteristics paid to men and women. (422)

Although this process provides an understanding of how to go about measuring the gender wage gap there are still some problems with it, as pointed out by Ehrenberg & Smith, having to do with productive characteristics. First, there is always a possibility that some productive characteristics cannot be measured and second, that such characteristics won't be included in data sets used in modeling. As part of identifying and measuring wage discrimination, there are both competitive and noncompetitive market models. However, before looking into detail

at the models, I will first highlight some of the fundamental assumptions held within the models.

There are many assumptions that underlie the neoclassical school of thought that are important aspects of the theory that develop into characteristics of the models. I have pooled together some of the many assumptions that arise in the literature.[3] Some assumptions that are specific when considering workers include:

1. Minority and majority [men and women, respectively] groups of workers are equally productive (or have equal productive capacity) and have equal tastes for work. (Cain, 698)

2. Discrimination against females can be said to exist whenever the relative wage of males exceeds the relative wage that would have prevailed if males and females were paid according to the same criteria. (Oaxaca, 694)

3. Discriminatory tastes will be reflected in the wage differences. (Arrow, 5)

Furthermore, there exist assumptions with respect to the market:

4. Given the tastes, the markets work smoothly. (Arrow, 5)

5. General equilibrium requires full employment. (Arrow, 5)

6. Wages will adjust to clear the market. (Arrow, 5)

7. Competition tends to reduce the degree of discrimination in the market […] Only the least discriminatory firms survive. (Arrow, 9)

---

[3] These assumptions exist throughout the literature; I have specifically pulled them out and listed them in these categories. The references are to where each assumption itself was pulled from.

These assumptions contribute generally to labor market discrimination models and hypotheses within the neoclassical paradigm. Different models will add, isolate, and use particular assumptions that reflect the goals and aims of the models themselves. Regardless of which model is used, neoclassical models and theories generally aim to predict, describe, and enhance our understanding of whether discrimination exists in the market and what effects it has on demand of labor force (Cain (1986); Ehrenberg & Smith (1997); Arrow (1971)). Precision is an important epistemic virtue of neoclassical models. With this general understanding of the neoclassical theory and modelling approach to the gender wage gap, I will look at two models that are both within the neoclassical theoretical tradition. First I look at Gary Becker's model of discrimination and focus on his concept of employer discrimination. This is followed by Ronald Oaxaca's decomposition model of the wage gap, which is a further application of Becker's model of discrimination.

2.2.1 Gary Becker Model

The first model I will go into detail about is Gary Becker's 1957 model for measuring discrimination. This model uses the theory of labor market discrimination to develop mathematical tools to measure and determine the existence of discrimination and resulting in a wage gap. Becker's model measure wage discrimination through statistical regression analysis. In discussing Becker's model I refer to two main sources: Joyce Jacobson (1994) and Ronald Ehrenberg & Robert Smith (1997). Jacobson focuses attention to Becker's model with respect to gender and Ehrenberg & Smith focus on Becker's model with respect to the

labor market more generally. Together they provide a general understanding and conception of Becker that is well suited to the context of this thesis.

In consideration of the form of methodology used in mainstream economics more generally, Jacobson (1994) points out how frequently Becker's theoretical model is used:

> By far the most widely used method by economists for attempting to measure discrimination, either nationwide or in a more limited sphere, is statistical analysis of wage patterns […] Researchers attempting to measure the amount of the wage differential attributable to demand-side discrimination try to control for supply-side factors through use of regression analysis. The unexplained amount of wage differential is then attributed to discrimination. (314)

Jacobson explains Becker's methodology and models for measuring wage discrimination[4], starting with the "regression of wage W on personal characteristics" (315):

$$(1) \quad W = \sum^n \beta X$$

> where X is a set of n characteristics and β is the corresponding set of n coefficients for a set of persons. Regressions have the characteristic that evaluating them at the mean for all independent variables yields the mean wage for the group (315).

Isolating now, specifically, for men and women's mean wages, we can use the following equations:

$$(2) \quad \overline{W}_m = \sum^n \beta_m \overline{X}_m$$

$$(3) \quad \overline{W}_f = \sum^n \beta_f \overline{X}_f$$

---

[4] The following equations ((1) – (11)) and descriptive text about the equations is taken directly from Jacobsen, 1994, pages 315 – 317.

The next step is to measure the gender wage gap, G:

$$(4) \quad G = \bar{W}_m - \bar{W}_f = \sum^n \beta_m \bar{X}_m - \sum^n \beta_f \bar{X}_f$$

And the unadjusted wage ratio, U, is

$$(5) \quad U = \frac{\bar{W}_f}{\bar{W}_m} = \frac{\sum^n \beta_f \bar{X}_f}{\sum^n \beta_m \bar{X}_m}$$

We can normalize that gap relative to the male wage so that it will range from 0 to 1:

$$(6) \quad g = \frac{G}{\bar{W}_m} = 1 - U$$

An adjusted wage ratio can be calculated in one of two ways, using either the male mean characteristics (A) or the female mean characteristics (A')

$$(7) \quad A = \frac{\sum^n \beta_f \bar{X}_m}{\sum^n \beta_m \bar{X}_m}$$

$$(8) \quad A' = \frac{\sum^n \beta_f \bar{X}_f}{\sum^n \beta_m \bar{X}_f}$$

Then the unexplained proportion of the gap can be defined in one of several ways, either using A, as in the equations for d below; using A', as in the equation for d' below, or using a different numerator than for d, as in the equation for d^* below:

$$(9) \quad d = \frac{1-A}{1-U} = \frac{\sum^n (\beta_m - \beta_f) \bar{X}_m}{G}$$

$$(10) \quad d' = \frac{1-A'}{1-U}$$

$$(11) \quad d* = \frac{\sum^n (\beta_m - \beta_f) \bar{X}_f}{G}$$

28

Inasmuch as we cannot tell whether A or A' will be larger, we cannot predict whether d or d' will be larger. However, if $\bar{X}_m > \bar{X}_f$ and $\beta_m > \beta_f$ for all n characteristics, then $d > d^*$.

Jacobson notes a different commonly used measure:

The discrimination coefficient D:

$$D = \frac{\frac{W_m}{W_f} - (\frac{W_m}{W_f})^\circ}{(\frac{W_m}{W_f})^\circ}$$

where $(\frac{W_m}{W_f})^\circ$ is the wage ratio that would be observed in the absence of discrimination and $\frac{W_m}{W_f}$ is the actual wage ratio. The larger D is, the greater the amount of discrimination (342).

Overall, what this model is telling us is that discrimination is the result of dividing the adjusted wage for men or women, a mean wage measuring individual characteristics, by the unadjusted wage. Thus, the resulting value reveals the proportion of the wage gap that is the result of discrimination. For example, if women's adjusted wage earns a decreasing proportion of the unadjusted wage we would see the percentage explained by discrimination increasing (i.e. if A' is decreasing, then d' would be increasing). With this, we now have a general measure for discrimination with respect to men and women's wages.

With this general measure of the gender wage gap established, I can now focus on the sources of discrimination discussed in the literature concerning Becker's model of

discrimination. Referencing again to Ehrenberg & Smith and Jacobson, I will look at the

three different sources of discrimination: personal prejudice, statistical prejudgment, and

noncompetitive markets.[5] The first model to be discussed is that of employer discrimination

which falls into the categories of personal prejudice or tastes for discrimination models.

Within employer discrimination models, the wage of workers is measured with respect

to their marginal revenue productivity, *MRP* and the devaluation of their productivity, *d*.

Marginal revenue product is the change in revenue (or gain) with the addition of one extra

unit, keeping all other variables and factors the same. The devaluation of productivity is the

loss associated with the extra unit. The unit of measure here is each worker themselves and

the work they do. The following two equations show the measure of wages for men and

women, respectively (433):

$$(1)\ MRP = W_M$$

$$(2)\ MRP - d = W_F$$

$$\text{Or } MRP = W_F - d$$

$$\text{Therefore: } W_M = W_F + d \text{ or } W_F = W_M - d$$

In equation (1) we see that the wage men earn equals the gain or revenue earned for their unit

of productivity. Whereas, the wage women earn equal the revenue earned for their unit of

productivity after it is devalued *(MRP – d)*. Ehrenberg & Smith point out important

implications of this measure. First, non-discriminatory employers hire men until the marginal

---

[5] Ehrenberg & Smith labelled the three general sources of labor market discrimination in their text on pages 432-448. Jacobson discusses "models involving tastes for discrimination" and "models of discrimination that do not involve prejudice" on pages 323 – 334. Both authors' accounts of models will be discussed together as applicable.

revenue productivity equals the wage of men, thus maximizing their profits (see equation (1)

above) and will do the same for women. Therefore for non-discriminatory firms:

$$MRP = W_M = W_F$$

Discriminatory employers on the other hand, "give up profits in order to indulge their

prejudices" because they will pay higher wages to alternative employers instead of hire

women or minorities who they hold distaste for (see equation (2) above) (434).

What is most important to note however, is that with employer discrimination,

"discriminators seem to be maximizing *utility* (satisfying their prejudicial preferences)

instead of *profits*" (436). This is important as firms, generally in competitive markets,

maximize their profits, thus any firm not doing so should be out-competed by the firms

which do. This suggests that non-discriminatory firms should be out-competing

discriminatory firms in the long run. However, the literature shows that we still see the

gender wage gap as a result of labor market discrimination in the long run (436). Thus,

market forces are not working in competitive markets as they are assumed to. Specifically,

Ehrenberg & Smith suggest, "[…] employer discrimination is most likely to persist when

owners or managers have the ability and the incentive to pursue a goal other than profit

maximization" (436). Jacobson aligns with this claim by suggesting that in response to the

behavior of non-discriminatory firms driving out discriminatory ones in competitive markets,

it is likely that less competitive markets will host more discriminatory firms, such as

monopoly markets. I will go into more detail on monopoly markets later in this section.

In addition to employer discrimination there also exist employee discrimination and customer discrimination. The former arises within the supply side of the market, where male workers with be paid a higher wage in order to compensate their distaste to working with female workers. The latter arises when customer's preferences for men leads to segregated occupations and work places (Ehrenberg & Smith, 436 - 440).

Employer, employee, and customer discrimination models are the most common models that Becker put forward to represent of possible sources of labor market discrimination. Cain illuminates how Becker was able to insert "the abstract concept of 'prejudice' into the economic concept of 'tastes' […]" (710). We must consider the advantages and disadvantages to using the concept of tastes. Some of the advantages of Becker's tastes for discrimination models include the continuity and measurability of "monetary units [which] have an intuitive meaning to experts and laypersons alike," while also having behavioural and policy implications more generally (710). On the other hand, there are also disadvantages, such as the fact that "no attention is paid to any pain or stigma felt by the victim" (710). This is an important factor to note as it captures the negative aspect of women's wages such as their marginal revenue productivity being discredited as I explained earlier in this section.

The next source for labor market discrimination can arise out of statistical prejudging or statistical discrimination. This type of discrimination occurs when a "firm will evaluate the *personal* characteristics of it applicants, but in seeking to guess their potential productivity it may also utilize information on the average characteristics of *groups* to which they belong"

(Ehrenberg & Smith, 440). This is an important type of discrimination to consider as it often takes place before the hiring process even occurs and can create a stigma towards women or minority groups altogether. Additionally, there are also non-competitive market labour discriminations that can occur, including monopoly, monopsony, crowding and dual labour market scenarios and market environments. However, I will not go into detail of these types of discriminatory behaviours, as they are not relevant to our discussion here.

Overall, we can gain a general understanding of labor market discrimination resulting in a gender wage gap from Gary Becker's model, which results in a measure for discrimination as a proportion of the wage gap. This model allowed us to isolate men and women's wages, first adjusted for individual characteristics and second unadjusted, and find the difference in wages for each gender category. What is important is that this model can tell us if there is a wage gap with respect to gender and further, what portion of the gap is the result of wage discrimination. Next, I will focus in on sources of discrimination. The most commonly used measure for sources of discrimination is employer discrimination. Here employers are sacrificing profits in order to satisfy their tastes for discrimination resulting in maximizing their utility instead of profits. This is important as it defies the basic neoclassical assumption that employers will maximize profits above all else, because the employer discrimination model reveals that employers are maximizing their utility and sacrificing profits to do so. Although this model suggests that discriminatory employers don't behave in the way they are assumed to behave (profit-maximizing), it is still within the theoretical tradition of neoclassical economics. This finding supports the theory of discrimination and allows us to

33

claim that employers are acting in discriminatory ways because it's possible to measure the sacrificing of profits for utility instead in the hiring practices. With this, Gary Becker offered an early, generalized account of how to measure the gender wage gap with respect to discrimination, while maintaining the neoclassical theoretical tradition.

Next, I will look at another neoclassical model that is a further generalization of Becker's. The reason for presenting two neoclassical models is that Karamessini & Ioakimoglou (who present a Marxist model of the gender wage gap) directly compare and criticize the Oaxaca neoclassical model to their Marxist model. I will consider the results of this comparison later in this chapter. First I look to the next model, Ronal Oaxaca's, which was developed after Becker's and offers a more generalized measurement of the gender wage gap.

2.2.2 Ronald Oaxaca Model

The next model I will discuss is the Oaxaca (1973) model of discrimination. This model is a further generalization and application of Gary Becker's basic model previously discussed. To start, this model first defines the discrimination coefficient, D.[6]

$$(1) \quad D = \frac{\left(W_m/W_f\right) - \left(W_m/W_f\right)^\circ}{\left(W_m/W_f\right)^\circ}$$

where,

$$\left(W_m/W_f\right) = \text{the observed male/female wage ratio;}$$

---

[6] The Ronald Oaxaca (1973) model (equations 1 – 16) can be found on page 694 – 697. *D,* in this model is the same as the discrimination equation found in Gary Becker's model.

and

$$\left({W_m} / {W_f} \right)^\circ = \text{the male/female wage ratio in the absence of discrimination.}$$

This first step isolates for discrimination by subtracting the male/female wage ratio absent from discrimination, from the observed male/female wage ratio, and then dividing the given total by the male/female wage ratio in the absence of discrimination. Oaxaca specifies the natural logarithm as an equivalent equation. Oaxaca's description of discrimination (1) is simply "Becker's generalized measure divided by the wage ratio in the absence of discrimination" (695). The use of this generalized measure allows for increased flexibility and maneuverability in empirical work, according to Oaxaca:

With natural logarithms:

$$(2) \qquad \ln(D + 1) = \ln\left({W_m} / {W_f} \right) - \ln\left({W_m} / {W_f} \right)^\circ$$

Assuming that employers in a non-discrimination labor market adhere to the principle of cost minimization, we have

$$\left({W_m} / {W_f} \right)^\circ = {MP_m} / {MP_f} \; ;$$

where MP_m and MP_f are the marginal products of males and females, respectively.

Now looking specifically at the estimation of D, as Oaxaca specifies, "Since $\left({W_m} / {W_f} \right)^\circ$ is

unknown, the estimation of D is equivalent to estimating $\left(\dfrac{W_m}{W_f}\right)$ °" (695). Furthermore,

considering this estimation of D, Oaxaca specifies important assumptions that are included as

while continuing to build the model further:

> If there were no discrimination, 1) the wage structure currently faced by females
> would also apply to males; or 2) the wage structure currently faced by males would
> also apply to females. Assumption one (two) says that females (males) would on
> average receive in the absence of discrimination the same wages as they presently
> receive, but that discrimination takes the form of males (females) receiving more
> (less) than a nondiscriminating labor market would award them.

Given the assumptions, the effects of discrimination on the male or female wages are

recognizable as opposed to a wage absent of discrimination. First I will define the wage

equation for each sex group

$$(3) \qquad \ln(W_i) = Z_i'\beta + u_i \qquad\qquad i = 1, \ldots n$$

where,

W_i = the hourly wage rate of the i-th worker

Z_i' = a vector of individual characteristics

β = a vector of coefficients

u_i = a disturbance term

As Oaxaca explains, the next step is to express the wage equation in a natural logarithm together with equation (2) and the assumptions of wages in absence of discrimination to understand the effects of discrimination.[7]

Let

$$G = \frac{\overline{W_m} - \overline{W_f}}{\overline{W_f}}$$

then,

$$(4) \qquad \ln(G + 1) = \ln(\overline{W_m}) - \ln(\overline{W_f})$$

where, $\overline{W_m}$ and $\overline{W_f}$ are the average hourly wages for males and females, respectively. From the properties of ordinary least squares estimation, we have

$$(5) \qquad \ln(\overline{W_m}) = Z'_m \widehat{\beta_m} \text{ and}$$

$$(6) \qquad \ln(\overline{W_f}) = Z'_f \widehat{\beta_f}$$

where

Z'_m and Z'_f = vectors of mean values of the regressors for males and females

$\widehat{\beta_m}$ and $\widehat{\beta_f}$ = corresponding vectors of estimated coefficients.

Substituting (5) & (6) into (4) we obtain,

$$(7) \qquad \ln(G + 1) = Z'_m \widehat{\beta_m} - Z'_f \widehat{\beta_f}$$

If we let,

$$(8) \qquad \Delta \overline{Z}' = \overline{Z'_m} - \overline{Z'_f}$$

$$(9) \qquad \Delta \widehat{\beta} = \widehat{\beta_f} - \widehat{\beta_m}$$

and substitute $\widehat{\beta_m} = \widehat{\beta_f} - \Delta\widehat{\beta}$ in (7), then the male-female wage differential can be written as

---

[7] Descriptions of equations (4) – (16) are taken directly from Oaxaca page 696-7.

$$(10) \qquad \ln(G+1) = \Delta\bar{Z}' \ \widehat{\beta_f} - \bar{Z}'_m\Delta\hat{\beta}$$

On the basis of equation (2) and the assumptions that the current female wage structure would apply to both males and females in a non-discriminating labor market, it can be shown that

$$(11) \qquad \ln\left(W_m/W_f\right)^\circ = \Delta\bar{Z}' \ \widehat{\beta_f}$$

$$(12) \qquad \ln\left(\widehat{D+1}\right) = -\bar{Z}'_m\Delta\hat{\beta}$$

Thus expressions (11) and (12) represent the decomposition of the wage differential into the estimated effects of differences in individual characteristics and the estimated effects of discrimination, respectively.

An alternative decomposition of the wage differential is obtained by substituting $\widehat{\beta_f} = \Delta\hat{\beta} + \widehat{\beta_m}$ in (7):

$$(13) \qquad \ln(G+1) = \Delta\bar{Z}' \ \widehat{\beta_m} - \bar{Z}'_f\Delta\hat{\beta}$$

On the basis of equation (2) and the assumptions that the current male wage structure would apply to both males and females in a non-discriminating labor market, it can be shown that:

$$(14) \qquad \ln\left(\widehat{W_m}/W_f\right)^\circ = \Delta\bar{Z}' \ \widehat{\beta_m}$$

$$(15) \qquad \ln\left(\widehat{D+1}\right) = -\bar{Z}'_f\Delta\hat{\beta}$$

What is important about this estimator is, "the separate estimates obtained from using both the male and female regression weights establish a range of possible values" (697). Using the

regression weights and separating the male and female wage differentials allows for any number of values. Another important variable to consider, as specified by Oaxaca, is work experience (697):

> Since the data on actual number of years of work experience for a large sample of worker are generally unavailable, we define a proxy for actual work experience:

$$(16) \qquad\qquad X_i = A_i - E_i - 6$$

> where
> $X_i =$ potential experience,
> $A_i =$ the age of the i-th individual,
> $E_i =$ number of year of schooling completed by the i-th individual.

Oaxaca clarifies on page 697,

> Potential experience is a reasonable proxy for actual experience in the case of males since males on average exhibit a strong attachment to the labor force. However, potential experience overstates the actual years of work experience of females to the extent that many female workers have left the labor force for some period in the past due to their household and childbearing activities. …. If the estimator of the coefficient on the linear experience term were biased downward for females, then $-\Delta\hat{\beta}$ would be upward in this instance. Consequently, there would be bias toward finding discrimination.

In order to remedy the problem with work experience for females, Oaxaca specifies controlling within the tests for number of children *(C)*, where "The linear children variable reflects the cost of lost experience due to child care, including the costs from the depreciation of skills during the periods of absence from the labor force" (698). Oaxaca discusses in more detail the remaining control variables used in the empirical study, however I will not go into

further detail of them here. What is important to understand within the model is the choice of control variable. Oaxaca claims,

> A researcher's choice of control variables implicitly reveals his or her attitude toward what constitutes discrimination in the labor market. If it were possible to control for virtually all sources of variation in wages, one could pretty well eliminate labor market discrimination as a significant factor in determining wage differentials by sex … The other extreme is to control for virtually nothing and thereby minimize the role of productivity differences […] This is tantamount to declaring at the outset that the two labor inputs are near perfect substitutes and therefore attributing virtually all of the observed wage differential to labor market discrimination […]. (699)

Generally, this model explains that the observed or measured gender wage gap is a result of labor market discrimination. This is the same result Gary Becker arrived at in the previous model described. What is important is that the observed wage gap is attributed to the discrimination coefficient, which is the "the simple difference between the observed wage ratio and the wage ratio in absence of discrimination" (695). This is the measure that Becker offered in his model and is emphasized further here in Oaxaca's model. Specifically, the gender wage gap is a result of labor market discrimination because the models can be manipulated enough with difference control variables to actually eliminate the wage gap, which suggests the other sources of discrimination outside of the labor market (employer, employee, or consumer) are less significant to the wage gap since it's possible to make it disappear.

In consideration of the neoclassical fundamental assumptions I discussed in the first part of this section, I can look a little closer at the effects of the neoclassical models I've considered. Looking at two assumptions: discriminatory tastes will be reflected in the wages (assumption 3) and competition reduces the degree of discrimination in the market (assumption 7). First, both models (Becker and Oaxaca) showed discrimination or discriminatory tastes in the different wages between men and women, positively reflecting the first assumption. However, the second assumption proved was not positively reflected, as competition and the market failed to eliminate discriminatory behaviours. What this suggests is that there are still some questions left unanswered about labor market discrimination since the neoclassical models were not able to satisfy or bring truth to each assumption. Perhaps then there is a need for alternative explanations and models of the gender wage gap and labor market discrimination. I will consider this idea in the next chapter, but first I will take a look at the Marxist theoretical framework and a model used to measure the gender wage gap.

2.3 Marxist Approach to Labor Market Discrimination

An alternative to the neoclassical models of discrimination, are the Marxist models of discrimination. Here I will look at a single model that is a feminist and Marxist account of labor market discrimination, according to Karamessini & Ioakimoglou (2007). This model is Marxist, in that it reflects "Karl Marx's theory of wages [which] explicitly considers as determinants of the value of the labor power both culture – such as social habits pertaining to reproduction – and the balance of power between labor and capital, depending on unemployment and institutions" (32), while also using a Marxist framework of capitalist

competition. This model also utilizes feminist theories of how patriarchy and capitalism have contributed to producing employment segregation by gender (34). This model is an alternative to the neoclassical models when investigating the gender wage gap.

According to Karamessini & Ioakimoglou, there is a main division that occurs within the different economic approaches to theorizing and modeling wages:

> The main division, however, is between the macroeconomic approach of classical economists who maintained that wages are determined according to a certain standard of living either equal to the level of subsistence or socially determined and historically specific, and the microeconomic approach of the neoclassical economists who argue that wages are determined through individual transactions and the working of market forces according to the marginal revenue product of labor.

The methodological approaches to the different models discussed here reflect this division. I have already discussed the microeconomic approach in the previous section, which looked at wage and occupational discrimination amongst individual workers. Here the Marxist model is more of a macroeconomic approach, which considered social determinants of the wage gap.

Further reflection on the division between neoclassical economists and classical economists is also reflected in the assumptions that underlie the theories and models within the Marxist approach. Some of the assumptions that are important to the Karamessini & Ioakimoglou (2007) model I will be discussing include:[8]

---

[8] The assumptions have been taken from Karamessini & Ioakimoglou (2007) article; however I have added the numbering of them and put them into a list. The assumptions are not in any particular order or ranking.

1. Wage-setting is a political, cultural, and economic process embedded in an institutional and societal context. Market forces alone cannot determine outcomes (32).

2. Culture and history matter, as does the relative power of employers and workers (32).

3. Gender relations […] have fundamental effects on wages, as they affect both the bargaining power differentials between different social groups and cultural norms and values concerning the relative worth of their labor power […] (32).

4. Gender differences in productivity-related endowments, discrimination, and segregation are not the only determinants of the pay gap. Gender relations are integral to the wage-setting process and institutions (34).

5. Three dimensions of the wage structure are likely to influence the gender pay gap: the size and ranking of wage differentials by industry, occupation, and type of organization, the system of job grading, and the form of payment systems […] general changes in the wage structure may also affect the gender pay gap over time along with "gender-specific" factors […] (34).

6. Individual bargaining takes as reference the average wage for the worker's occupation in the industry, the worker's firm, and the average qualifications and skills required for the worker to perform that occupation in that particular industry (41-42).

There are some noteworthy differences between these assumptions and those discussed previously in the section on neoclassical theories and models.

First, it was understood in the neoclassical approach that non-discriminatory firms should outcompete discriminatory ones, and thus the market forces would clear the market of employer discrimination. However, the Becker and Oaxaca models made it clear that this does not always occur. In contrast, the Marxist approach does not assume that market forces alone can determine outcomes of employer discrimination (Marxist assumption 1). Another important difference is that neoclassical models assumed that men and women were "equally productive" and "had equal tastes for work" (neoclassical assumption 1), thus gender difference reflected discrimination. Whereas, the Marxist approach takes as an assumption that gender differences with respect to "productivity-related endowments" (Marxist assumption 4) cannot reflect discrimination or differences in the wage gap alone, and rather that there can exist "'gender-specific factors" (Karamessini & Ioakimoglou, 34). This will be important for the development of the models and understanding the composition of the labor market to which the models are measuring. The next section will focus in detail on one Marxist model. I selected this model because the authors were very explicit about their unique feminist and Marxist approach, while also offering critiques of neoclassical models, specifically the Oaxaca model.

2.3.1 Karamessini & Ioakimoglou Model

The main focus of my discussion of Marxist approaches to the gender wage gap will use the Karamessini & Ioakimoglou (2007) model. Differing from the previous neoclassical models

discussed, this model starts from a "classical framework of wage determination," arguing that "average earnings are determined socially by the value of the labor power, in the Marxian sense" (32). Furthermore, this model uses a "comprehensive feminist approach to gender wage discrimination, which we define as both unequal pay for equal work (unequal remuneration in the same job) and unequal pay for work of equal value (low valuation of jobs that women do)" (34). Largely, the aims of this model are "to shed light in the macro- and micro-determinants of the gender pay gap and contribute to a better understanding of the practices and processes through which gender wage discrimination is (re)produced" (35). The authors also aim to develop an alternative to neoclassical models, such as Oaxaca's, which test for the gender wage gap (36).

This model combines Marxist and feminist methods of measuring the gender wage gap. It consists of two equations considering both macro- and microeconomic factors affecting wages. The first equation they consider measures occupational wages, while the second measure individual wages (35). Once occupational wages are measured, deviations such as different characteristics, jobs, firms, and bargaining power of workers are measured to determine the individual wages. Thus, individual wages are measured from occupational wages. According to Karamessini & Ioakimoglou the two equations for occupational and individual wages arise from three levels of analysis:

1. Factors determining intra-industry and inter-industry wage differentials among workers with similar levels of skill and education.
2. Factors determining the occupational wage structure within industries.

45

3. Factors determining deviations of individual wages from occupational wages within industries. (35)

As I work through the Marxist model, I will show these equations being developed with respect to each of these levels of analysis. First, looking at industry wages among workers, then creating a measure for the occupational wage within the industry, and finally, creating an equation for the individual wages by measuring deviations from the occupational wages that individual wages reflect within the industry.

Starting with the first equation, I look at average occupational wages by modeling inter-industry wage differentials is as follows:[9]

> Assume that there are (j) occupations; (k) industries; (R) average rate of profit across industries; (Y) value added (volume); (K) capital (volume); (W) the average money wage; (N) number of employees; (p_c) consumer price index; (p) price of value added; (p_{cap}) price of fixed capital; ($pY/p_{cap}K$) productivity of capital at current prices; (WN/pY) labor share in value added at current prices; (w) = (W/p_c) average real wage; (π)=(Y/N) productivity of labor; (k)=(K/N) intensity of capital; (w/π) real unit labor cost; (π/k) capital productivity at constant prices. Then the general definition of the profit rate is:
>
> $$(1) \quad R = \left(1 - \frac{pc}{p}\frac{w}{\pi}\right)\left(\frac{p}{pcap}\frac{\pi}{K}\right)$$

R = (1 – labor share at current prices) * (capital productivity at current prices)

> To equalize the profit rate (R_k) in industry (k) with the average profit rate and given that the average nominal wage (w_k^o) is set in the labor market, average industry prices are set at level (p_k). These (p_k) are prices of production in the Marxian sense and

[9] The following equations are taken from Karamessini & Ioakimoglou pages 36 – 39.

$$(2)\ p_k = \frac{p_{cap}R}{\frac{\pi_k}{K_k}} + p_c \frac{w_k^0}{\pi_k}$$

Once prices of production are formed, the average real wage in industry (k) has an upper bound given by the relation

$$(3)\ w_k^{max} = \frac{p_k}{p_c}\pi_k - \frac{p_{cap}}{p_c} Rk_k$$

[…] the average real wage (w^*_k) in industry (k) cannot exceed an upper bound given by the relation

$$(4)\ w_k^* = \frac{p_k^*}{p_c^*}\pi_k - \frac{p_{cap}^*}{p_c^*} R^*k_k = \pi_k \left(\frac{p_k^*}{p_c^*} - \frac{p_{cap}^*}{p_c^*} R^* \frac{k_k}{\pi_k^*} \right)$$

Symbol (*) indicates that industry profit rates are not equal to the general profit rate. Thus (R*) is the general rate of profit when priced deviate from production prices. […] the upper bound for real industry wages (w^*_k) is industry specific and the factors affecting industry differences in upper bounds are demand relative to productive capacity, advance in technology and work organization, and the degree of competition. […]

The maximum real industry wage (w^*_k) is not what is actually paid (w_k). The average wage actually paid in industry (k), is a function of the maximum real wage (w^*_k) and the bargaining power of working (λ_k)

$$(5)\ w_k = \lambda_k w_k^*$$

From this analysis of inter-industry wages, Karamessini & Ioakimoglou expect that the wage rates will be positively correlated with "persistent excess demand, productivity of labor productivity of capital, union density, and institutional factors" (39). These factors will consequently influence the bargaining ability of employees, as well as "average establishment size and degree of competition" (39). This is important as I continue to

47

develop the model because I already know that individual wages are the deviations of occupational wages, such as bargaining power. Therefore, the positive correlation found in the inter-industry wages will eventually impact the individual wages.

The next step is to measure occupational mix and industry wages. Karamessini and Ioakimoglou note that differences in occupational wages are the result of differences in occupations requiring skilled (complicated) labor versus occupations requiring unskilled (simple) labor (35). Here, it is important to note that the skills gained through education and training for the skilled occupation are considered a commodity, resulting in complicated labor power as having "greater value than simple labor power and wage rates are higher in occupations of higher education and training" (40). What is important and valuable for our discussion on the gender wage gap, is that the "occupational mix affects labor and capital productivity and, eventually, the balance of power between capital and labor in each industry and, by this way, the average industry wages" (40). This results in the following equation:

$$(6) \ \ln W_k = p\overline{E_k} + \sigma + \varepsilon_k$$

> where (p) is a vector of coefficients, ($\overline{E_k}$) is the vector of characteristics of industry (k) identified above including the composition of occupations in difference industries, and (σ) is a constant.

Next, Karamessini & Ioakimoglou consider occupational wages in industry, where "Each industry has a different ability to pay for simple or complicated labor, according to its

maximum real wage ($w_k{*}$). Thus wages for occupation (j) in different industries vary according to ($w_k{*}$) (40-41). This can be expressed in the following equation:

$$(7)\ \ln \overline{W_{J,k}} = \beta^* \overline{E_{J,k}} + d + \varepsilon_{j,k}$$

[where] ($\overline{W_{J,k}}$) is the average wage in occupation (j) in industry (k); (β^*) is a vector of coefficients; ($\overline{E_{J,k}}$) is a vector including, first, characteristics of industry (k) ad defined previously and, second, average characteristics of occupations (j) in industry (k); while (d) is a constant capturing unobserved characteristics of industry (k). (41)

The effect that women have within different occupations is important to note here, as their dominance in certain occupations and industries reduces both their wages and the wages of male workers in those occupations and industries. Consider the following:

The share of female workers in an occupation/industry is thus expected to be negatively correlated with the average wage rate in that occupation and industry. This modifies equation 7 in the following way

$$(8)\ \ln \overline{W_{J,k}} = \beta^* \overline{E_{J,k}} + y\phi_{j,k} + d + \varepsilon_{j,k}$$

Next, I can consider individual wages with respect to the bargaining relationship between employees and employers. Karamessini & Ioakimoglou note, "While the individual bargaining power of employees differs according to their qualifications and experience, gender also plays a role" (42). Noteworthy of this Marxist feminist approach is the technique of including a unique vector for worker and firm characteristics which leads to the deviations of such characteristics from average wages rates ($W_{j,k}$) in occupation (j) in industry (k). This differs from the neoclassical approach which doesn't actually measure for occupational

49

wages but rather inserts a dummy variable instead (42). With the difference in variables considered in this model, I can develop an equation for individual earnings:

$$(9) \ \ln W_{i,j} - \ln \overline{W}_j = \beta_j(X_{i,j} - \overline{X}_j) + c_j + \varepsilon_{i,j}$$

$(W_{i,j})$ is the gross hourly earnings of worker (i) in occupation (j), $(\overline{W}_j)$ is the average gross hourly earnings in occupation (j), $(X_{i,j})$ is a vector of characteristics (personal, job, and firm) of the individual (i, j), (β_j) is a vector of coefficients measuring the market price for deviations of observed individual characteristics comparatively to average characteristics in occupation (j). $(\overline{X}_j)$ is a vector of average characteristics in occupation (j), constant (c_j) is the unexplained part of $(\ln W_{i,j} - \ln \overline{W}_j)$ and $(\varepsilon_{i,j})$ is an error term $(\overline{\varepsilon_{i,j}} = 0)$. Denoting with letter (m) and (f) the variables corresponding respectively to males and females, we take from equation 9 two separate equations for men and women working in occupation (j):

$$(10) \ \ln W_{i,j}^m - \ln \overline{W}_j = \beta_j^m(X_{i,j}^m - \overline{X}_j) + c_j^m + \varepsilon_{i,j}^m$$
$$(11) \ \ln W_{i,j}^f - \ln \overline{W}_j = \beta_j^f(X_{i,j}^f - \overline{X}_j) + c_j^f + \varepsilon_{i,j}^f$$

Since individual bargaining power of employees is expected to differ by gender, (β_j^m) and (β_j^f) should be different. Moreover, (c_j^m) and (c_j^f) should also differ, reflecting gender differences in unobserved characteristics and wage discrimination by gender. Concretely, it is expected that $(c_j^m) > 0$ and $(c_j^f) < 0$.

This is an important part of this model because we are now getting the first understanding of a measure that actually reveals a gender wage gap. Now the model adapts equations 10 and 11 to consider workers distributed in more than one occupation. Thus, workers now have

average characteristics and averages wages, which is denoted further for men and women (43):

$$(12)\ \ln \overline{W^m} - \ln \overline{W_r^m} = \beta_m \left(\overline{X^m} - \overline{X_r^m} \right) + c^m$$

$$(13)\ \ln \overline{W^f} - \ln \overline{W_r^f} = \beta_f \left(\overline{X^f} - \overline{X_r^f} \right) + c^f$$

where $\overline{W_r^m}$ and $\overline{W_r^f}$ are the average reference wages for men and women respectively.

Karamessini and Ioakimoglou claim on pages 43 - 44,

> Gender segregation of employment leads to lower reference wages $(\overline{W_r^f})$ in two ways: First, a high female share of employment in an occupation lowers the average wage in that occupation $(\overline{W_J})$.

> It follows from equation 12 and 13 that the difference in the earnings of the average male worker and the average female worker is:

$$(14)\ \ln \overline{W^m} - \ln \overline{W^f} = \left(\ln \overline{W_r^m} - \ln \overline{W_r^f} \right) + \beta_m \left(\overline{X^m} - \overline{X_r^m} \right) - \beta_f \left(\overline{X^f} - \overline{X_r^f} \right) +$$
$$(c^m - c^f)$$

The next part of this model considers the decomposition of the gender wage gap (44 - 47).

The technique used is similar to that used in Oaxaca (1973), one of the neoclassical models I have already discussed in this chapter.

$$(15)\ \ln \overline{W^m} - \ln \overline{W^f} = \left(\ln \overline{W_r^m} - \ln \overline{W_r^f} \right) + \beta_m \left[\left(\overline{X^m} - \overline{X_r^m} \right) - \left(\overline{X^f} - \overline{X_r^f} \right) \right] +$$
$$(\beta_m - \beta_f) \left(\overline{X^f} - \overline{X_r^f} \right) + (c^m - c^f)$$

Term $\left(\ln \overline{W_r^m} - \ln \overline{W_r^f} \right)$ measures the impact of gender segregation of employment on wage differentials, since male and female aggregate reference wages depend on

differences in the distribution of men and women across occupations and industries as well as on the gender composition of occupations within industries. Term $\beta_m \left[\left(\overline{X^m} - \overline{X_r^m} \right) - \left(\overline{X^f} - \overline{X_r^f} \right) \right]$ refers to the impact of difference in observed individual characteristics on the gender pay gap compared to the impact of differences in average characteristics in occupations and industries on the gender pay gap. The corresponding term in the standard Oaxaca-Blinder equation is $\beta_m (\overline{X^m} - \overline{X^f})$, meaning that differences in individual characteristics directly affect the gender pay gap.

The difference here between this Marxist model and the neoclassical model previously discussed is that the Marxist model is more able to separate "the part of the gender pay gap explained by the different occupational distributions of men and women from that explained by gender differences in the individual characteristics of workers" (45), which allows it to better estimate for the positive or negative contributions individual characteristics have on the gender wage gap. This is a very important part of my investigation in this thesis as I assess this complex phenomenon. The difference in techniques and tools that each model uses will be reflected in the empirical results once I actually assess the application of the decomposition models to real world data, which gives me insight to this phenomenon in reality. In the next chapter I will take a closer look at the important differences between the Marxist and the neoclassical models.

Next, I can assess the equation in this model, which is the decomposition of the gender pay gap:

$$(16)\ \ln \overline{W_m} - \ln \overline{W_f} = \left(\ln* \overline{W_r^m} - \ln* \overline{W_r^f}\right) + \left[\left(\ln \overline{W_r^m} - \ln* \overline{W_r^m}\right) + \right.$$

$$\left.\left(\ln \overline{W_r^f} - \ln* \overline{W_r^f}\right)\right] + \beta_m\left[\left(\overline{X^m} - \overline{X_r^m}\right) - \left(\overline{X^f} - \overline{X_r^f}\right)\right] + \left(\beta_m - \beta_f\right)\left(\overline{X^f} - \right.$$

$$\left.\overline{X_r^f}\right) + (c^m - c^f)$$

This Marxist model considers "the outcome of difference in employment distribution of women and men across occupations and industries and the outcome of the gender composition of occupations and industries" (46). In this equation the first two terms on the right hand side measure the distribution effect, which is "women's higher concentration in the lower-paid occupations and industries" and the undervaluation effect, which is "lower average wages in feminized occupations and industries," while considering how each impacts the gender wage gap (46).

Overall, this model measures the gender wage gap through an alternative approach to the previously discussed neoclassical models. Specifically this model uses two separate equations, developed through a Marxist and feminist theoretical lens. The first equation refers to "average occupational wages in different industries" and the second refers to "individual wages as deviations from occupational wages in industries" (55 – 56). In the first equation it was possible to see that females within occupations and industries negatively affected occupational wages. The second equation clarifies the understanding that the "impact on wages of individual bargains between employers and employees according to

deviations of the characteristics of the employees, their jobs, and their employer from occupational and industry averages" (56).

Now that I have established an understanding and measure of the gender wage gap from both a Marxist and neoclassical framework, I can compare the empirical results. The next section will go into detail about the empirical results from each model separately, and then compare the results side by side to give us a better understanding of what the models are able to reveal about the gender wage gap and labor market discrimination.

2.4 Discussion and Conclusion

In this section I will now discuss some of the most important parts of the Marxist and the neoclassical models and assess some of the empirical results of the models.

First, Karamessini & Ioakimoglou claim that their "proposed method of decomposition has a much higher explicative power of the gender pay gap than the standard one" (54). It is important for our discussion here to understand how the Marxist model could be, and to question whether it truly is, more explicative than the standard model. I start this inquiry by looking deeper into the results of both the Marxist and the neoclassical models. First, I assess the results of the Marxist model. Figure 1 shows the results of applying the Marxist method to the labor market in Greece in 1995.

Table 2 Decomposition of the gender pay gap in Greece (1995)

	Industry		Services	
	Percent of pay gap	Share of the gap	Percent of pay gap	Share of the gap
1. Segregation effect *of which:*	14.1%	56.5%	11.4%	50.4%
Under-valuation (γ) effect	4.4%	17.8%	4.1%	18.3%
Distribution ($q^f_{j,k}$) effect	9.7%	38.7%	7.3%	32.2%
2. Gender differences in observed characteristics	4.2%	16.9%	5.7%	25.6%
3. Different market prices by gender paid for observed characteristics = wage discrimination by employers	0.2%	0.7%	−0.7%	−3.0%
4. Gender differences in unobserved characteristics + measurement errors + wage discrimination by employers unrelated to observed characteristics	6.5%	25.9%	6.1%	27.0%
Gender pay gap (% of the average male pay)	24.9%	100%	22.5%	100%

Figure 1: Table 2 Decomposition of the Gender Pay Gap in Greece (1995), Karamessini & Ioakimoglou (2007: 53)

Now breaking down Figure 1 to better understand what it is telling us, I look to the discussion offered in Karamessini & Ioakimoglou. The first component (1. in the graph) is measuring the segregation effect, which is the result of two different effects. First, the undervaluation effect where, "the higher female share of employment in particular occupations and industries lowers the average wage in these occupations and industries for both males and females" (52). Second is the distribution effect, where women are disproportionately represented in industries that have on average lower wage rates (52). The

second component (2. in the graph) is the gender differences in observed characteristics. Here age, education, job, and employer characteristics are taken into consideration. The third component (3. in the graph) is wage discrimination, which is the price employers pay for observed characteristics. The fourth component (4. in the graph) is the combination of "unobserved characteristics, measurement errors of observed characteristics, and wage discrimination by employers unrelated to observed characteristics" (54).

A noteworthy point to understand about this decomposition of the wage gap is that, "[t]he third component of the gender pay gap represents the lower bound, while the sum of the third and fourth components corresponds to the upper bound of gender wage discrimination practiced in individual employers" (54). Furthermore, given these measurements, Karamessini & Ioakimoglou claim:

> According to our theoretical approach, wage discrimination against women is not only practiced by individual employers but is also incorporated in the wage structure through the historical undervaluation of women's work and current collective bargaining practice that determine average wages in occupations and industries. (54)

This finding confirms where the gender wage gap is coming from, how it is built into the structure of employment for women generally, and what this means for understanding labor market discrimination.

Next, I investigate the results of the Oaxaca model. It is important to note that the Oaxaca model does not look at the Greece 1995 labor market, but it is still worth taking a closer look at what the results show from the study. Note that a direct comparison of the

56

Marxist and neoclassical methods applied to the Greece 1995 labor market will be discussed

below. Figure 2 shows the result of discrimination from full-scale wage regression using the

Oaxaca method (discussed previously in this chapter).

TABLE 3

THE EFFECTS OF DISCRIMINATION ESTIMATED FROM THE FULL-SCALE WAGE REGRESSIONS

Item	Whites				Blacks			
	Female Regression Weights		Male Regression Weights		Female Regression Weights		Male Regression Weights	
	(1)[a]	(2)[b]	(3)[c]	(4)[b]	(5)[a]	(6)[b]	(7)[c]	(8)[b]
Wage differential	.4307	100.0%	.4307	100.0%	.3989	100.0%	.3989	100.0%
Adjustment for sex differences in								
Experience	−.0056	−1.3	−.0074	−1.7	−.0009	−0.2	−.0017	−0.4
Education	−.0051	−1.2	−.0037	−0.9	+.0170	+4.3	+.0140	+3.5
Class of Worker	−.0218	−5.1	−.0144	−3.3	−.0120	−3.0	−.0418	−10.5
Industry	−.0745	−17.3	−.0901	−20.9	−.0995	−24.9	−.1170	−29.3
Occupation	−.0059	−1.4	−.0338	−7.8	−.0451	−11.3	.0090	−2.3
Health Problems	+.0012	+0.3	+.0017	+0.4	−.0006	−0.2	−.0019	−0.5
Part-time	−.0065	−1.5	−.0273	−6.3	+.0006	+0.2	−.0184	−4.6
Migration	+.0030	+0.7	+.0001	0.0	+.0013	+0.3	−.0002	0.0
Marital Status	−.0078	−1.8	−.0271	−6.3	−.0070	−1.8	−.0157	−3.9
Children	−.0309	−7.2	.0000	0.0	−.0015	−0.4	.0000	0.0
Size of Urban Area	−.0015	−0.3	−.0012	−0.3	−.0030	−0.8	−.0022	−0.6
Region	+.0002	0.0	.0000	0.0	−.0045	−1.1	−.0050	−1.3
	$\ln(\widehat{D+1})=.2755$ $(\hat{D}=.32)$	63.9%	$\ln(\widehat{D+1})=.2275$ $(\hat{D}=.25)$	52.9%	$\ln(\widehat{D+1})=.2437$ $(\hat{D}=.27)$	61.1%	$\ln(\widehat{D+1})=.2000$ $(\hat{D}=.22)$	50.1%

[a] The adjustment for the j-th variable using female regression weights is $-\hat{\beta}_{fj}\Delta\bar{Z}_j$, and therefore the sum is $-\Delta\bar{Z}'\hat{\beta}_f$. This implies
$\ln(\widehat{D+1}) = \ln(G+1) - \Delta\bar{Z}'\hat{\beta}_f = -Z_m'\Delta\hat{\beta}$.
[b] Each adjustment is expressed as a percentage of the wage differential.
[c] The adjustment for the j-th variable using male regression weights is $-\hat{\beta}_{mj}\Delta\bar{Z}_j$, and therefore the sum is $-\Delta\bar{Z}'\hat{\beta}_m$. This implies
$\ln(\widehat{D+1}) = \ln(G+1) - \Delta\bar{Z}'\hat{\beta}_m = -\bar{Z}_f'\Delta\hat{\beta}$.

Figure 2: Table 3 The Effects of Discrimination Estimated from the Full-Scale Wage Regression, Oaxaca (1973: 705)

These results show the various control factors that were used to measure discrimination.

Here, the idea is that once one controls for all these factors, the remaining differences in the

wages are evidence from discrimination. Also, it is possible to isolate for the effects each of

these factors contributes to the wage. From these results it is important to note that "sex differences in the distribution by class of worker, industry, and occupation significantly narrow the wage differential even through industry and occupation are represented by highly aggregated categories" (707). Furthermore, Oaxaca claims:

> We are in agreement with other researchers that unequal pay for equal work does not account for very much of the male-female wage differential. Rather it is the concentration of women in lower paying jobs that produces such large differentials. Our results suggest that a substantial proportion of the male-female wage differential is attributed to the effects of discrimination. (708)

It is noteworthy, that both the Marxist and the neoclassical method are finding discrimination to be a large contributor to the gender wage gap. However, both methods show different proportions of the gender wage gap are resulting from wage discrimination, undervaluation of women in occupations, and the distribution of women in occupations.

To get a better sense of the comparison between both methods, I can look to Karamessini & Ioakimoglou once again. Figure 3 shows the breakdown that Karamessini & Ioakimoglou provide in their findings, note the Oaxaca-Blinder method is the standard, neoclassical method previously discussed, while Table 2 results refers to the Marxist, feminist method used by Karamessini & Ioakimoglou discussed earlier.

Table 3 Comparative results

	Industry		Services	
	Oaxaca-Blinder method	*Table 2 results*	*Oaxaca-Blinder method*	*Table 2 results*
Occupational and industry segregation	15.6%	56.5%	10.3%	50.4%
Educational attainment	3.3%	0.9%	2.7%	0.6%
Accumulated work experience	19.7%	9.0%	31.3%	16.1%
Married or divorced	0.9%	−0.4%	2.5%	0.5%
Job characteristics	14.5%	6.1%	11.2%	5.3%
Firm characteristics	1.5%	1.3%	4.6%	3.1%
Discrimination, measurement errors and unobserved characteristics	44.7%	26.6%	37.4%	24.0%
Sum	100%	100%	100%	100%

Figure 3: Comparative Results, Karamessini & Ioakimoglou (2007: 53)

   Karamessini & Ioakimoglou highlight some differences they found after testing their method and the Oaxaca-Blinder method to the labor market in Greece 1995:

> […] we have found that the basic differences between the two methods lie in the respective contribution to the explained portion of the pay gap of gender differences in accumulated work experience on one hand, segregation of employment by gender on the other; in the size of "employer-induced" gender wage discrimination; and in the size of overall gender wage discrimination. (56)

This is an important comparison as the two methods can be applied to test for the same categories but reveal a different percentage of the gender wage gap being attributed to labor market discrimination, i.e. the dominant source of the gender wage gap is different. Clearly occupational and industry segregation are the most dominant contributors to the gender wage

gap for the Marxist, feminist method, while discrimination is the most dominant contributor for the neoclassical method.

A closer look at the comparisons in the empirical results of both the neoclassical and Marxist methods reveals that different components contribute in varying ways to the gender wage gap. Using these two methods together can offer a pluralist approach to measuring and understanding the gender wage gap. The kinds of pluralism in economics, and the way the case study aligns with them, will be topic of discussion in the next chapter, followed by a discussion about what conclusions I have reached regarding my motivating research question: What is the nature of pluralism in economics?

Chapter 3
Pluralism about Economics and the Gender Wage Gap

3.1 Kinds of Pluralism about Economics

I would now like to consider how the models I've just discussed in the previous chapter are

relevant to the different kinds of pluralism about economics. Recall, I discussed different

kinds of pluralism about science in Chapter 1. In this chapter I will discuss these different

kinds of pluralism with respect to economics and investigate which kinds of pluralism the

case study is consistent with and the consequences of this.

3.1.1 Modest Pluralist Economics

Modest pluralism about science accepts that multiple models or theories could be necessary

to describe and understand a phenomenon given the context of inquiry at a particular time,

but that eventually this plurality of theories will resolve into monism. Thinking back to the

first-wave of pluralism in economics that was mentioned in Chapter 1, the attempt to increase

competition and contestability amongst methods motivated pluralism generally, but the kind

of pluralism which emerged aligns closely with modest pluralism. The goal for modest

pluralism about economics remains that one method or approach will out-compete the others,

and thus, that this pluralism resolves into monism.

In the rest of this section I will discuss the ways that the gender wage gap case study is

consistent with some aspects of this kind of pluralism. If I consider just the two neoclassical

models together it seems like a case of modest pluralism, however once I consider the

Marxist and neoclassical models together, it becomes clear this is not only a case of modest

pluralism but also another kind of pluralism. I argue that the best interpretation of this case is that it represents multiple kinds of pluralism.

Starting with the two neoclassical models, the case is consistent with modest pluralism because the two models can be integrated. While both can be, and have been, considered as stand-alone models, they are based on the same fundamental assumptions and can be formally combined. These two models are modestly pluralist because they are mathematically consistent, both can be true at the same time, both use the same theory of labor market discrimination, both include features to measure wage discrimination by employers, and both are within a microeconomic paradigm.

Looking closely at the consistencies between the two neoclassical models, I see some shared assumptions the two methods use. First, both models use the neoclassical assumptions 2 and 3 about discrimination:

2. Discrimination against females can be said to exist whenever the relative wage of males exceeds the relative wage that would have prevailed if males and females were paid according to the same criteria. (Oaxaca, 694)

3. Discriminatory tastes will be reflected in the wage differences. (Arrow, 5)

These assumptions can be further recognized by each model's shared equation for the discrimination coefficient. Equation (12) from the Becker model and equation (1) from the Oaxaca model measure discrimination by subtracting the male/female wage ratio absent of discrimination, from the observed male/female wage ratio, then dividing the given total by the male/female wage ratio in absence of discrimination:

$$(1) \quad D = \frac{\left(W_m/W_f\right) - \left(W_m/W_f\right)^{\circ}}{\left(W_m/W_f\right)^{\circ}}$$

This measure of the discrimination coefficient shows the mathematical consistency of the two models. This mathematical consistency can further be recognized by considering that the two models could be formally combined. I consider Oaxaca's to be a more advanced model than Becker's, because it starts with the discrimination coefficient and develops more complex equations that can control for and decompose particular variables such as experience, education, children etc. as seen with equation (16). Oaxaca's decomposition is a way to empirically apply Becker's model of discrimination. Within Oaxaca's model, it is possible to see how different elements, specifically individual characteristics and discrimination, affect the wage gap, which can be seen in equations (11) and (12), respectively. Becker and Oaxaca's neoclassical models are consistent with modest pluralism because the existence of pluralism can ultimately be resolved. It can be resolved because these models can be formally combined and one can consider Oaxaca's model as an extension of Becker's.

However, a different and additional form of pluralism, a form that is inconsistent with modest pluralism, arises when one considers the Marxist and the neoclassical models together. The reason for this is that the Marxist model and the neoclassical model both use their own fundamental assumptions and theoretical approaches to measure the gender wage gap, which are distinctly separate. Further differences between these models include the Marxist model being a macroeconomic approach and the neoclassical model being a

microeconomic approach to modeling and understanding the gender wage gap. Since the fundamental theoretical differences and technical differences between the two models make it difficult to formally combine them, this case cannot be understood as an example of modest pluralism. I will now look at the ways these two models are different in closer detail.

First let's consider some of the different fundamental assumptions. One of the biggest differences is the effect that market forces have on wages, specifically neoclassical assumption (6):

6.   Wages will adjust to clear the market. (Arrow, 5)

and the Marxist assumption (1):

1.   Wage-setting is a political, cultural, and economic process embedded in an institutional and societal context. Market forces alone cannot determine outcomes (Karamessini & Ioakimoglou, 32).

The neoclassical assumption here implies that wages adjust, according to the supply and demand for labor, until the market equilibrium is reached. Thus, the resulting wage is result of market forces. Whereas, the Marxist assumption is that there is a lot more than market forces that determine where the wage is set, including the institutional and societal contexts. The neoclassical approach seems to be separating the market from the institutional and societal contexts, which the Marxist approach includes. Specifically, neoclassical models assume the market itself can make wages adjust enough to satisfy the supply and demand of labor, whereas the Marxist model assumes more than the market itself makes wages adjust enough to satisfy the supply and demand of labor. This illuminates how these models are

64

from different theoretical traditions, which is enough to consider this case to be inconsistent with modest pluralism.

A second difference is that these two kinds of models engage in analysis at different levels of organization. Neoclassical models and equations arise first, from collecting statistical information of both men and women's characteristics that are theoretically relevant to determining earnings (education, skills, etc.). Next, from measuring wages for each gender group with respect to individual characteristics and measuring what wage would be without considering individual characteristics, and finally, from comparing the wages adjusted for individual characteristics to those unadjusted. The Marxist approach, on the other hand, has equations that arise from three different levels of analysis. First, measuring wages for workers with similar skills and education in an industry, next measuring occupational wage structure within an industry, and third, measuring differences in individual wages from occupations within an industry. The differences in the approaches the two models use also contributes this case being inconsistent with modest pluralism, because the microeconomic neoclassical model derives individual wages from measuring different individuals in an occupation, whereas the macroeconomic Marxist model derives individual wages from measuring the general occupation wage and then measuring the deviations of individuals from this wage. Again, the different theoretical traditions which each model uses, makes this case inconsistent with modest pluralism.

A third difference in our consideration of the case of Marxist and neoclassical models together which makes it inconsistent with modest pluralism is the technical measure for

individual characteristics. In equation 15 of the Marxist model, the technical measure shows

the indirect effect that individual characteristics have on wages:

$$(15)\ \ln \overline{W^m} - \ln \overline{W^f} = \left(\ln \overline{W_r^m} - \ln \overline{W_r^f}\right) + \beta_m \left[\left(X^m - \overline{X_r^m}\right) - \left(X^f - \overline{X_r^f}\right)\right] +$$
$$\left(\beta_m - \beta_f\right)\left(\overline{X^f} - \overline{X_r^f}\right) + \left(c^m - c^f\right)$$

In this equation the specific term of interest is $\beta_m \left[\left(X^m - \overline{X_r^m}\right) - \left(X^f - \overline{X_r^f}\right)\right]$. This term in

the Marxist model compares observed individual characteristics to average characteristics in

occupations and industries, while measuring the impact on the gender gap. This comparison

between the observed and average characteristics allows this measure to show the indirect

effect individual characteristics have on the wage gap.

In the Oaxaca model on the other hand, the term is $\beta_m(\overline{X^m} - \overline{X^f})$, which measures the

observed individual characteristics. Here, these characteristics have a direct effect on the

wage gap. I also look at equation (8) and (9) in the Oaxaca model:

$$(8) \qquad\qquad\qquad \Delta \overline{Z}' = \overline{Z'_m} - \overline{Z'_f}$$

$$(9) \qquad\qquad\qquad \Delta \hat{\beta} = \widehat{\beta_f} - \widehat{\beta_m}$$

Where Z_i' = a vector of individual characteristics and β = a vector of coefficients (i.e.

control variables such as education, family, etc.). The Oaxaca technique results in $\Delta \overline{Z}'$

and $\Delta \hat{\beta}$ being "near perfect substitutes," which results in the personal, observed individual

characteristics directly impacting the wage gap. These equations and this technique in the

Oaxaca model allow for detailed examination of pay discrimination between genders for

equal individual characteristics (Oaxaca, 699). The technical difference is the direct versus

66

indirect effects of individual characteristics on the wage gap in the neoclassical versus the

Marxist models, respectively. The technical differences and the equations used are the

mathematical tools to express the theory of discrimination each model uses, further reflecting

their different theoretical traditions and making this case inconsistent with modest pluralism.

In this section I have considered the nature of modest pluralism in economics with

respect to our case study. It is clear that two forms of pluralism exist; one is modest pluralism

when I consider the case of the neoclassical models, then other is another type of pluralism

that arises when I consider the case of both the neoclassical and the Marxist models. In the

next two sections I will look into the radical and empirical kinds of pluralism to get a better

sense of which type of pluralism can better explain the case of including the Marxist and

neoclassical models of the wage gap.

3.1.2 Radical Pluralist Economics

Radical pluralism is one of the more extreme kinds of pluralism in scientific inquiry.

According to this approach, the complexity of objects in the world demands there be multiple

approaches to classify and understand the real world and I cannot argue that one is better than

another. It is tempting to consider the pluralism arising from Marxist and neoclassical

approaches as a case of radical pluralism. However, this kind of pluralism is vaguely defined

within the philosophy of science literature and this makes it difficult to understand how well

this case study exemplifies it.

There are some benefits that would arise if our case could be interpreted as an example

of radical pluralism. Allowing for the possibility that two different models could both be true

allows researchers to explore both models. Since these models consider different kinds of causes of the wage gap it could be the case that a variety of sources are considered true causes of the phenomenon. Each model reveals different aspects and source components of the phenomenon as contributing to the wage gap differently. One of the most significant differences between the two models is the Marxist model using a macro-economic theoretical approach, whereas the neoclassical model uses a microeconomic theoretical approach. However, there are also problems that arise from a radical pluralist approach.

The difficulty with this kind of pluralism is its lack of insight into which models are better than others with respect to the phenomenon in the real world. If the intention is for economics to be socially relevant there needs to be a justification that the models are good representations of the phenomenon in the real world. Note that this is not a problem for modest pluralism because the models can be compared and combined. Furthermore, the empirical pluralism also does not have this problem because the reasons particular the models or approaches are chosen to measure a phenomenon is the result of assessing the phenomenon in the real world. In the next section I will look closely at empirical pluralism where I can better understand the benefits of using both models.

3.1.3 Empirically Based Pluralist Economics

The next kind of pluralism to discuss is empirical pluralism, where using multiple models offers a plurality of representations of a given phenomenon, which best reflects the phenomenon in the real world. In Chapter 1 I introduced empirical pluralism in science generally, where I showed that it can be associated with: (a) complex phenomena– whether

associated with crossing levels of organization or multiple factors within the same level of organization; (b) the existence of a variety of explanatory interests; (c) the openness of constraints – whether from above or below (such as different levels of idealization or distorting the phenomenon from its real world representation); and (d) particular explanatory strategies vis-à-vis phenomena being limited (*xiii –xv*).[10] Empirically based pluralism is constituted by the use of multiple approaches to understanding the phenomenon of interest (Kellert et al., *xiii*). It is important to note that empirical pluralism is different from modest pluralism because empirical pluralism acknowledges that complete integration or resolution of pluralism would not be possible without losing some content about the phenomenon. Recall in the section on modest pluralism, I could integrate the two neoclassical models and resolve the pluralism without actually losing any insight into the phenomenon from the neoclassical theoretical perspective. However, I will show in this section that if I were to only use the Marxist or the neoclassical approach, I would lose some content about the phenomenon, specifically content about the source components. Considering the case of the Marxist and the neoclassical models I show that there is theoretical and empirical justification for using both models. This section will look at the evidence from our case study that is consistent with empirical pluralism, while also considering benefits of this approach.

Before looking at the evidence from the case study, I would like to consider the second-wave pluralism in economics, as introduced in Chapter 1, and see how it aligns with

---

[10] I have listed the ways myself, whereas Kellert et al. discuss these way extensively throughout the specified pages.

empirical pluralism. This economic pluralism was motivated by scholars within the discipline who were disenchanted with the "notion of science as empire building or paradigmatic one-upmanship, a monist view they ascribed to many mainstream economists as well as to their first-wave critics" (Garnett et al. 2010, 2). Garnett et al. (2010) highlights some of the demands that scholars and students alike advocated for within this type of pluralism:

> […] a more open and scientific economics, guided by a philosophically principled pluralism: '[a pluralism] that regards the various "schools" of economic reality, each bringing into view different subsets of economic phenomena … [and] rejects the idea that any school could possess final or total solutions, but accepts all as possible means for understanding real-life economic problems.' (3)

This kind of pluralism in economics requires different theoretical approaches for understanding and explaining a phenomenon and is explicit about the expectation that one approach alone is not sufficient for understanding economic phenomenon in the real world. Therefore the kind of pluralism the second-wave pluralism in economics is calling for is compatible and consistent with empirical pluralism. I keep this kind of pluralism in economics in mind as I now look at the case study to assess its consistencies with empirical pluralism.

Looking at evidence from both the Marxist and the neoclassical models, I will assess the ways this case study is consistent with empirical pluralism. There are certain aspects of the case study, such as the complexity of the phenomenon and the limitations of each of the neoclassical and Marxist models that align with empirical pluralism. Recall in Chapter 2, the results of the decomposition from both models showed that occupation segregation and wage

discrimination were the most dominant source components for the gender wage gap; however the two models were opposite with respect to which component had the largest or most dominant contribution to the wage gap. The Marxist model found that occupational and industry segregation contributed to 56.5 percent of the wage gap, whereas the neoclassical model only found it contributed 15.6 percent. On the other hand, the neoclassical model found wage discrimination contributed to 44.7 percent of the wage gap, whereas the Marxist model only found it contributed 26.6 percent (Karamessini & Ioakimoglou, 53). Considering this result, it is possible to understand how using only one model in isolation could be lead to a partial understanding of the gender wage gap. If I were to only consider the Marxist model, my primary concern would be occupational and industry segregation, whereas if I only considered the neoclassical model, it would be discrimination that is most concerning. If I want to be as thorough and complete as possible in my knowledge of the gender wage gap, then it benefits from this kind of pluralism. Furthermore, both the Marxist and the neoclassical models come out of respectable traditions and by recognizing the strengths of both models I resist being dogmatic in my support of one model over the other.

The wage gap is a complex phenomenon. It is different in different social contexts and likely has multiple causes. It turns out that these contexts tend to be explored and understood in different theoretical contexts and traditions in economics. The Marxist and the neoclassical models are both supported by strong theoretical traditions that rely on different sorts of assumptions. The Marxist view is well-suited to understand how wages are related to social standards of living and are socially determined in that wages are determined by the social

power of labor (such as habits of reproduction etc.) and the balance of power between labor and capital. The neoclassical view is better at understanding wages as determined by market forces, such as the marginal revenue product of labor, and individual transactions and exchanges. Insofar as there are these two kinds of determinants of wages, both theoretical paradigms are relevant, and in fact I will likely need more than one paradigm to understand the multiple facets of this phenomenon.

I am now turning to a discussion of some of the differences between the two models in order to demonstrate how the different theoretical paradigms are relevant and how this case is consistent with empirical pluralism. Recall in Chapter 2, I highlighted some of the differing assumptions that were relevant to the models. First were the assumptions about market forces, where the neoclassical theory assumes market forces determine wages and the market can be cleared of discrimination through competition, on the other hand the Marxist theory assumes market forces alone can determine outcomes of discrimination. The differences in this assumption reflect the different methodological approaches of the models. The Marxist model considers variables that go beyond the market such as the social aspects that could impact labor and thus wages, whereas the neoclassical model focuses on what happens inside the market such as individual transactions and the marginal revenue product of labor.

Another important difference was the assumptions about workers themselves. In the neoclassical approach, men and women are assumed to be equally productive thus wage discrimination is directly related to gender differences. On the other hand, the Marxist approach assumed there are gender-specific factors that exist in workers, thus wage

discrimination is not directly related to gender differences. I look further at the models to see how this second difference in the theoretical assumptions surfaces in the technical equations used in the decomposition of the wage gap. Recall in the section on modest pluralism, I talked about the differences in the technique used by each model with respect to individual characteristics.[11] Although this technique made our case study inconsistent with modest pluralism, it is this technique that makes our case study consistent with empirical pluralism. Specifically, in the Marxist model individual differences have an indirect effect on wage discrimination, whereas in the neoclassical model they have direct effect wage discrimination. The technique used in each model reflects the theoretical tradition it arises from and contributes to the difficulty in formally combining these models. The use of these techniques and the importance the techniques hold within their respective models make this case consistent with empirical pluralism, because losing either of these techniques could result in losing content or knowledge about the phenomenon. While these models are very different, it is possible to take a perspective on the gender wage gap in which we can see that both models refer to the same general phenomenon and that both of them contribute to our understanding of that phenomenon.

Considering the definition of empirical pluralism and the desire of the second-wave pluralism movement in economics that various schools of thought to exist together within the mainstream of the discipline, it is clear that our case study is consistent with this kind of pluralism. In this case study I have shown two different theoretical traditions used to

---

[11] Refer to page 61-62 and the discussion about the third difference between the models.

understand the gender wage gap, and this is consistent with empirical pluralism. Both the neoclassical and Marxist models are useful for understanding and measuring the gender wage gap; further, both are fruitful and insightful because they originate from fundamentally different assumptions and consider different variables to be critically important to the model's success. Furthermore, this type of pluralism would not claim that the neoclassical or the Marxist models alone are the most ideal or possess the solution to the gender wage gap, but rather that both models together are a means to understanding the phenomenon.

Referring back to the discussion in Chapter 2, both the Marxist and the neoclassical methods reveals different measureable components contributing different amounts to the gender wage gap. Although both models revealed the existence of the gender wage gap, the most dominant source of that gap was different. In the Marxist model the largest source component was occupational and industry segregation, while in the neoclassical model the largest source component was discrimination. The fruitfulness of this pluralistic approach is that it represents the diversity and complexity of the phenomenon. However, there seems to be a lack of real-world solutions to actually mitigate the wage gap. This suggests a need for future research and investigation. The value and fruitfulness of this kind of pluralism for economics is that it argues on theoretical and empirical grounds for multiple and diverse methodologies when investigating a complex phenomenon, which allows us to go gain knowledge from more than one perspective.

3.2 Discussion

Considering the question that motivated my investigation into the gender wage gap: What is the nature of pluralism in economics? What seems to be the most pressing conclusion of my analysis of the wage gap case study is that some kinds of pluralism are exemplified when interpreted the way models explain and measure the gender wage gap. It is clear that the case study can be interpreted as exemplifying two types of pluralism: modest pluralism when I consider the neoclassical models alone and empirical pluralism when I consider both the Marxist and the neoclassical models together.

Thinking back to the philosophy of science literature and kinds of pluralism about science discussed in Chapter 1 and using our discussion here in Chapter 3 about kinds of pluralism in economics, I have shown that more than one kind of pluralism exists with respect to the gender wage gap and that both kinds of models I've investigated are necessary and useful for understanding and measuring this phenomenon. Understanding what kind of pluralism is at play allows us to respect and value why and where the models are different, theoretically and methodologically. In the previous sections I highlighted some of the benefits of the kinds of pluralisms, including greater understanding and interpretation of the source components of the wage gap. Considering a phenomenon like the gender wage gap that is relevant, and socially and politically sensitive, it is very important that our inquiry into the phenomenon respect the complexity it holds in the real world. The modest pluralism stance shows us how pluralism is resolved within the neoclassical tradition and the

empirically based pluralist stance provides us the tools to recognize pluralism when I use the neoclassical and the Marxist models together to understand the wage gap.

I will now explore additional benefits that arise from empirical pluralism by referring back to the discussion of theories and models in Chapter 1. Recall the criteria established by Kincaid (2012) for economic theories and models, where models have explanatory power if they satisfy the five following criteria: 1) provide insight, 2) unify (different phenomena), 3) serve as an instrument, 4) are isomorphic to phenomena, and 5) fit the phenomena itself into a model (Kincaid, 2012: 147). It would be extremely difficult for one model to meet these criteria. However, when I consider a pluralist approach, using more than one model, it becomes less difficult to meet these criteria. Together the Marxist and neoclassical models increase our insight into the causal source components, they unify by showing the same causal components of the phenomenon, they serve as an instrument by allowing us to describe the real causes of the phenomenon, the models increase our understanding of the causes that exist in the real-world, and I am able to express this phenomenon, as it's understood in the real world, through the models.

For economists, this investigation and understanding the nature of pluralism and its consequences are useful. In this case study I've addressed some of the many benefits of the different kinds of pluralism, however what is important to note is that there are in fact many kinds of pluralism that are exemplified within economics. Being aware of the kind of pluralism represented in particular instances helps us to direct and make sense of our economic investigations. In my case study the modest pluralism was actually resolved when I

76

considered only the neoclassical models. However, there was no resolution of pluralism when I considered the case with both the Marxist and the neoclassical models. In the latter scenario, there was both intuitive and concrete evidence from the case study that empirical pluralism was useful in terms of increasing our understanding of the case study. Pluralism here is better than non-pluralism because it allows us to appreciate the significance of a wide range of factors, such as the many source components to the wage gap, as well as the effects of market forces, competition, and individual characteristics of workers.

For philosophers this investigation and understanding of the nature of pluralism and its consequences is useful because it offers a case study of multiple kinds of pluralism. The wage gap case study is consistent with different kinds of pluralism and there are benefits to both kinds of pluralism. This investigation furthers our understanding of scientific pluralism and the kinds of pluralism Kellert et al. present and identify. Furthermore, I think this case study suggests that it is unreasonable to think that models are independent of their fundamental and theoretical assumptions about the phenomenon. For example, the neoclassical model gives results based on the neoclassical fundamental assumptions 2 and 3, while the Marxist model gives results based on the Marxist fundamental assumptions 4 and 5, as discussed and presented in Chapter 2. With such a complex phenomenon, I don't want to limit my investigation by only considering an approach from one theoretical paradigm. Considering this case study from a policy or socially relevant perspective, the models tell us some truth about the phenomenon individually, but not all the truth. What I know is that each model is partial in that it focuses on different kinds of causes at different levels of

77

organization. I also know that the results of the different models are not consistent. Thus, I need to refrain from being dogmatic about the models in our approach to understanding this complex phenomenon.

In summary, right now within each theoretical tradition there is no justification for rejecting either the neoclassical or the Marxist view of the wage gap because they are both consistent with and arise out of a robust theoretical perspective and they both have empirical strength. If I look at this case study from a more global perspective, there is strong reason and justification to respect both views together, as made clear through my interpretation of the empirically based pluralism. With such a complicated phenomenon it is critical to look at different perspectives, as I have offered here. However, my interpretation of the kinds of pluralism being exemplified in this case does not exclude the potential of an all-encompassing view of the gender wage gap to be developed in the future. As a result of the differences I identified between the neoclassical and the Marxist approaches empirically, we need more research to be done regarding further measurements and sources of this phenomenon and we cannot be dogmatic about either the neoclassical or the Marxist view alone.

Conclusion

In the chapters in this paper, I have investigated the question: What is the nature of pluralism in economics? To answer this question I have focused on a case study of a particular economic phenomenon, the gender wage gap. This case study was chosen because it is socially and politically relevant, while being a complex issue in the real world. The existence of this phenomenon in the real world has important impacts on the welfare of individual people thus, it is important that I understand this phenomenon in the most complete way possible. In this investigation, I have looked closely at both Marxist and neoclassical theories of labor market discrimination and models of measuring the gender wage gap. Through my analysis of the two economic approaches, it is clear that pluralism does exist with respect to this case study and the arising pluralism is both economically and philosophically significant. There are however some very important things to note about the kinds of pluralism I have found.

My most important finding is that more than one kind of pluralism exists with respect to this phenomenon. Both modest and empirical pluralism arose with different considerations of the case study. Modest pluralism was exemplified when I considered the case using only the neoclassical models. With this finding I make my first conclusion: in the case of the gender wage gap modest pluralism exists within particular theoretical traditions, and this type of pluralism acknowledges the importance of having multiple models or alternatives when considering any given phenomenon within that theoretical tradition. Empirical pluralism resulted when I considered the case study with both the Marxist and the neoclassical models,

leading me to my second conclusion: in the case of the gender wage gap empirical pluralism

exists within multiple theoretical traditions and is fruitful because it provides more complete

knowledge of such a complex phenomenon. This case study found multiple kinds of

pluralism about economics being exemplified and being fruitful to understanding of the

gender wage gap.

But what does this say about economics generally? My interpretation of the two kinds

of pluralism exemplified in this case study means that pluralism is a possibility in economics

generally construed. The wage gap is a socially significant phenomenon, which will be

different in a variety of contexts. This leads me to suggest that future research can look for

modest pluralism within a theoretical perspective and be open to the possibility of empirical

pluralism among multiple theoretical perspectives. This case study provides a strong

foundation for further investigation into the nature of pluralism in economics, while clearly

providing reasons to believe that allowing for the possibility that two different models could

both be true, allows researchers to explore more than one model and further improving our

understanding of socially relevant, complex phenomena.

Bibliography

Alexandrova, A., & Northcott, R. (2013). It's just a feeling: why economic models do not explain. *Journal of Economic Methodology*, *20*(3), 262–267.

Arrow, K. (1971). The Theory of Discrimination. Presented at the Discrimination in Labor Markets, Woodrow Wilson School & Conference Office of Princeton University: Princeton University.

Barker, D. K., & Feiner, S. F. (2004). *Liberating Economics Feminist Perspectives on Families, Work, and Globalization*. University of Michigan.

Barker, D. K., & Kuiper, E. (Eds.). (2003). *Toward a Feminist Philosophy of Economics*. Routledge.

Batterman, R. W. (2005). Critical phenomena and breaking drops: Infinite idealizations in physics. *Studies in History and Philosophy of Modern Physics*, *36*, 225 – 244.

Cain, G. G. (1986). The Economic Analysis of Labor Market Discrimination: A Survey. In *Handbook of Labor Economics* (Ashenfelter & Layard, Vol. 1). Elsevier Science Publishers.

Callender, C. (2001). Taking Thermodynamics Too Seriously. *Studies in History and Philosophy of Modern Physics*, *32*(4), 539 – 553.

Colander, D. (2010). Moving beyond the rhetoric of pluralism: suggestions for an "inside-the-mainstream" heterodoxy. In *Economic Pluralism* (pp. 36 – 47). Routledge.

Davis, J. (1994). Pluralism in Social Economics. *History of Economic Ideas*, *2*(3), 119–128.

Davis, J. (2006). The turn in economics: neoclassical dominance to mainstream pluralism? *Journal of Institutional Economics*, *2*(1), 1–20.

Dobusch, L., & Kapeller, J. (2012). Heterodox United vs. Mainstream City? Sketching a
    Framework for Interested Pluralism in Economics. *Journal of Economic Issues*,
    XLVI(4), 1035–1057.

Douglas, H. (2000). Inductive Risk and Values in Science. *Philosophy of Science*, *67*(4), 559–
    579.

Douglas, H. (2007). Rejecting the Ideal of Value-Free Science. In *Value-Free Science? Ideals
    and Illusions* (pp. 120–139).

Douglas, H. (2009). *Science, Policy, and the Value-Free Ideal*. Pittsburgh, Pa.: University of
    Pittsburgh Press.

Ehrenberg, R. G., & Smith, R. S. (1997). *Modern Labor Economics*. Addison-Wesley.

England, P. (2003). Separative and Soluble Selves: Dichotomous Thinking in Economics. In
    Feminist Economics Today Beyond the Economic Man (pp. 33–60). The University of
    Chicago Press.

Eswaran, M. (2014). *Why Gender Matters in Economics*. Princeton University Press.

Fagiolo, G., Moneta, A., & Windrum, P. (2007). A Critical Guide to Empirical Validation of
    Agent-Based Models in Economics: Methodologies, Procedures, and Open Problems.
    Computational Economics, *30*(3), 195–226.

Fehr, C. (2011). What Is in It for Me? The Benefits of Diversity in Scientific Communities. In
    Feminist Epistemology and Philosophy of Science: Power in Knowledge. Springer
    Science and Business Media.

Ferber, M. A., & Nelson, J. A. (2003). *Feminist Economics Today Beyond Economic Man*.
    Chicago: The University of Chicago Press.

Fullbrook, E. (Ed.). (2004). *A Guide To What's Wrong With Economics*. Anthem Press.

Garnett, R., Olsen, E. K., & Starr, M. (Eds.). (2010). *Economic Pluralism*. Oxon: Routledge.

Harvey, J. T., & Garnett, R. F. J. (Eds.). (2008). *Future Directions for Heterodox Economics*.
University of Michigan.

Hausman, D. M. (2013). Preference, Value, Choice, and Welfare. *Ethics*, *123*(2), 370–374.

Hewitson, G. J. (1999). *Feminist Economics Interrogating the Masculinity of Rational
Economic Man*. Edward Elgar Publishing Limited.

Hicks, S. J. (1982). Causality in Economics. *History of Political Economy*, *14*(4), 609–611.

Hirshleifer, J. (1985). The Expanding Domain of Economics. *The American Economic
Review*, *75*(6), 53–68.

Jacobson, J. P. (1994). *The Economics of Gender*. Blackwell Publishers.

Karamessini, M., & Ioakimoglou, E. (2007). Wage Determination and the Gender Pay Gap: A
Feminist Political Economy Analysis and Decomposition. *Feminist Economics*, *13*(1),
31–66.

Kellert, S. H., Longino, H. E., & Waters, K. C. (Eds.). (2006). *Scientific Pluralism* (Vol.
XIX). Minneapolis: University of Minnesota Press.

Kincaid, H. (2012). Some Issues Concerning the Nature of Economic Explanation. In U. Mäki
(Ed.), *Handbook of the Philosophy of Science* (pp. 137–158). Elsevier.

Lee, F. S. (2010). Pluralism in Heterodox Economics. In *Economic Pluralism* (pp. 19–35).
Routledge.

Longino, H. E. (1990). *Science as Social Knowledge*. Princeton, New Jersey: Princeton
University Press.

Longino, H. E. (2002). *The Fate of Knowledge*. Princeton, New Jersey: Princeton University
Press.

Madra, Y. M. (2007). Late neoclassical economics: Restoration of theoretical humanism in contemporary mainstream economics. University of Massachusetts Amherst, ProQuest, UMI Dissertations Publishing.

Mäki, U. (1997). The One World and the Many Theories. In *Pluralism in Economics: New Perspectives in History and Methodology* (pp. 37–47). Edward Elgar Publishing Limited.

Mäki, U. (Ed.). (2012). *Philosophy of Economics*. Oxford, UK: Elsevier.

Marques, G., & Weisman, D. (2010). Is Kuhnean incommensurability a good basis for pluralism in economics? In *Economic Pluralism* (pp. 74–86). Routledge.

Mitchell, S. D. (2002). Integrative Pluralism. *Biology and Philosophy*, *17*, 55–70.

Morgan, M. S. & Knuuttila, T. (2012). Models and Modelling in Economics. In U. Mäki (Ed.), *Handbook of the Philosophy of Science* (pp. 49-87). Elsevier.

Muldoon, R., & Weisberg, M. (2011a). Robustness and idealization in models of cognitive labour. *Synthese*, *183*, 161–174.

Muldoon, R., & Weisberg, M. (2011b). Robustness and idealization in models of cognitive labour. *Synthese*, *183*, 161–174.

Nelson, J. A. (1996). *Feminism, Objectivity & Economics*. Routledge.

Nelson, J. A. (2010). Sociology, Economics, and Gender. *American Journal of Economics and Sociology*, *69*(4), 1127–1154.

Neumark, D. (1988). Employers' Discriminatory Behavior and the Estimation of Wage Discrimination. *The Journal of Human Resources*, *23*(3), 279–295.

Norgaard, R. B. (1989). The Case for Methodological Pluralism. *Ecological Economics*, *1*, 37–57.

Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review*, *14*(3), 693–709.

Odenbaugh, J., & Alexandrova, A. (2011). Buyer beware: robustness analyses in economics and biology. *Biology and Philosophy*, *26*, 757–771.

Philip, P. (1995). Transcendental realism - a foundation for evolutionary economics? *International Journal of Social Economics*, *22*(12), 19–35.

Robinson, J. (1964). *Economic Philosophy*. Pelican Books.

Salanti, A., & Screpanti, E. (Eds.). (1997). *Pluralism in Economics*. Edward Elgar Publishing Limited.

Saunders, L., & Darity, W. J. (2003). Feminist Theory and Racial Economic Inquiry. In *Feminist Economics Today Beyond the Economic Man* (pp. 101–114). The University of Chicago Press.

Sent, E.-M. (2006). Pluralism in Economics. In *Scientific Pluralism* (Vol. XIX). University of Minnesota Press.

Soderbaum, P. (2008). *Understanding Sustainability Economics*. UK and USA: Earthscan.

Stanford, J. (2008). *Economics For Everyone*. Canada: Fernwood Publishing.

Van Bouwel, J. (2004). Explanatory pluralism in economics: against the mainstream? *Philosophical Explorations*, *7*(3), 299–315.

Waller, W. (2010). Is convergence among heterodox schools possible, meaningful, or desirable? In *Economic Pluralism* (pp. 48 – 60). Routledge.

Weisberg, M. (2006). Robustness Analysis. *Philosophy of Science*, *73*(5), 730–742.

Weisberg, M. (2007). Three Kinds of Idealization. *The Journal of Philosophy*, *104*(12), 639–659.

Weisberg, M. (2013a). Robustness Analysis and Idealization. In *Simulation and Similarity* (pp. 156–170). Oxford University Press.

Weisberg, M. (2013b). *Simulation and Similarity: Using Models to Understand the World*. Oxford University Press.

Weisberg, M., & Reisman, K. (2008). The Robust Volterra Principle. *Philosophy of Science*, *75*(1), 106–131.