

# Chasing After "Good Jobs" Do They Exist and Does it Matter if They Do?\*

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# 1 Introduction

The statement, "I just got a good job" has, I think, real content for most people. If a friend said this in a conversation, we would congratulate her, having in mind an intuitive understanding of what it is to have a Good Job. Looking at images on the internet after typing in "good jobs" brings up, among other many other possibilities, pictures of demonstrators carrying placards demanding Good Jobs, suggesting they too have in mind a differentiation of jobs based on some set of characteristics. Zeynep Ton, in her book, *The Good Jobs Strategy* defines Bad Jobs as "jobs that pay low wages, provide scant benefits and erratic work schedules, and are designed in a way that makes it hard for employees to perform well or find meaning and dignity in their work." (Ton(2014)) Good Jobs have the opposite qualities: good pay, dignity, protection from arbitrary treatment by management, some form of workplace democracy, and the opportunity for self-realization. She gives a human form to the two types of jobs with the stories of two female middle managers. Janet has worked in a large retail chain store for seven years, rising to the position of a customer service manager over that time. But despite that impressive sounding title, in 2012 she made only about \$12 dollars per hour and an annual salary of about \$22,000. In addition, her hours were erratic and scheduled at the last minute. In contrast, Patty worked at another retail chain, QuikTrip. She also started at low wage but after 7 years and several promotions, her annual income was over \$60,000. Moreover, she had regular hours, benefits, and the opportunity to feel valued at her work. (Ton(2014)) In other words, she had a Good Job. Ton's argument is that Good Job and Bad Job firms can co-exist even in the highly competitive, low cost retail sector. Any firm can be a Good Job firm if it adopts the right organizational structure and treats its workforce as much as an asset as an expense. This can be profitable because workers provide more effort in return, bringing to mind efficiency wage models.

The idea that there are Good and Bad job employers can also be seen in the media where there are annual lists of the best employers (e.g., Fumano(2015)). For example, one of the top listed employers in British Columbia is 1 – 800 – *Got – Junk?*, which is a private junk collector. It manages to treat its employees well even though it operates in a sector that seems likely to be highly competitive since anyone with a truck is a potential competitor. At the other extreme, BC Business magazine published an article on the worst employers, though for liability reasons, they didn't actually name the bad firms. Instead, they listed the set of characteristics that make for a bad employer - a list which overlaps heavily with how Ton characterizes Bad Job firms (MacNeill(2005)).

Moreover, politicians clearly buy into the dichotomy of Good and Bad job firms. The film industry is often seen as a Good Jobs industry in British Columbia and support for using public money to attract film companies to the province extends across the political spectrum. Leading up to the last provincial election, the BC NDP leader Adrian Dix journeyed down to Los Angeles to pitch the province as a good place for the film industry to do business and said he would not rule out further tax credits for the industry. At the same time, John Cummins, the leader of the right wing Conservative Party stated he would consider temporary tax credits for the industry. Christy Clark, the Premier from the right wing Liberal party, was not in favour of more tax credits but argued that she was already giving \$285 million in tax credits to the BC film industry. (Bailey(2013)) And BC isn't alone by any means. Ontario's NDP government gave Cisco a \$220 million subsidy in exchange for a promise to employ 1700 more people. Nova Scotia gave \$304 million in forgivable loans to Irving Shipbuilding to bring its work there, and Alberta gave a \$300 million loan to a company to upgrade bitumen. (Morrow(2014))

Politicians across the country and across the political spectrum wouldn't be spending public money to attract high paying firms and industries unless they believe there is very widespread support for the idea among voters. In other words, the ubiquity of subsidies to firms perceived in this light would seem to imply that most people (or, at least the median voter) believe that Good Jobs exist and that they are worth trying to attract.

Among economists, however, the very existence of Good Jobs - let alone the usefulness of policies trying to subsidize or attract them - is controversial. In the 1980s and 1990s there was considerable debate over efficiency wage models, which provide theoretical underpinning for the existence of jobs paying above the market clearing wage in equilibrium. While one set of authors argued in favour of the applicability of such models in the real world, another set was adamant that there was a lack of strong evidence that what people might call Good Jobs exist. In the latter viewpoint, the variation in wages and working conditions that are clearly evident across jobs can be rationalized as equilibrium outcomes reflecting differences in productive abilities of workers and/or compensating differentials for job characteristics. Returning to the examples of Janet and Patty, most economists would at least point out the possibility that there are reasons for the differences in what each is paid and the job conditions they face. While Ton invites us to see these women as essentially identical, that might not be the case. Janet (the lower paid manager) may prefer to have Patty's pay but might not want to provide any extra effort to get it. Similarly, Janet may have less education or general ability than Patty. In this case, there would be no reason to celebrate if a friend tells us she got a Good Job -

the claim would be a conversation-stopper met with puzzled indifference. Why would she be claiming that this job is better or worse than any other when she is getting the same total compensation she would get on her next best alternative? These arguments cannot be easily dismissed just because many people in society seem to believe that Good Jobs exist since equilibrium outcomes can be hard to understand from the perspective of one worker or firm. Janitors could point to jobs as lawyers and say they look like Good Jobs but not fully take account of the associated training costs or the fact that many lawyers do not earn high salaries relative to those costs. Our friend could be talking up her Good Job in order to rationalize what was actually a hard decision on which job to take.

There is also an empirical reason for doubting the importance, of Good Jobs, if not their existence. In the empirical literature related to efficiency wages, Good Jobs were associated with high pay in certain industries relative to others for observationally equivalent workers. Based on those industry-premia estimates, some authors argued for pursuing industrial policies to shift the composition of employment toward high premium industries. But calculations of the impact of altering the industrial composition of employment on the average wage in an economy turn up small effects. This, I will argue, comes from the nature of standard decomposition calculations. If an industry that employs 10% of workers and pays a 20% wage premium relative to the average is replaced with an industry that simply pays the average wage, the overall average wage in the economy would only decline by 2% even though this is a seemingly large event (on par with the decline of the Steel Industry in a place like Pittsburgh or Hamilton). These decomposition results seem small compared to overall movements in the wage structure and tend to push analysts away from factors that operate through the composition of industries or jobs. Indeed, I believe it was this type of calculation that was behind the ultimate victory of those who argued against the importance of Good Jobs; to the extent that, today, the phrase "industrial policy" sounds archaic to the ears of most mainstream economists.

Importantly, if the wage and job characteristic distributions reflect a neoclassical equilibrium then there is no reason to subsidize the creation of what look from the outside to be Good Jobs unless there is some externality or other failure that the market has not taken into account. We could induce or regulate firms into providing better job characteristics but the more productive, harder working employees needed to compensate firms for their associated added costs may not exist. That, certainly, is the claim of the firms who have been using the Temporary Foreign Worker programme to hire low skilled workers: they create well-paid, good jobs but they can only find lazy, unproductive

workers to fill them among those already in Canada.

Whether Good Jobs exist is ultimately an empirical matter, but good empirical investigation in economics begins with theory. It is through the use of theory that we decide what to measure, where the identification pitfalls lie, and where we might find solutions to those pitfalls. I will look at different theories of the labour market that do or do not imply that Good Jobs can persist in equilibrium. In particular, I will primarily focus on a neoclassical Roy Model on one side and efficiency wage and search and bargaining models on the other. My goal is not to be exhaustive (or, possibly, terribly deep) in my description of these models but to examine them both to help refine our definition of Good Jobs into a form that can be examined with data and to work from that definition to derive empirical implications from the existence or non-existence of Good Jobs. The key implication is that Good Jobs must include a surplus in which workers share. That, as we will see, implies that worker outside options in the form of wages paid on other jobs in the labour market can affect the wage in the current match. In contrast, in an equilibrium neoclassical model or in an efficiency wage model in which workers give the whole surplus to firms through bond posting, there would be no such effect. This observation will play a central role in the empirical discussion.

I will divide the empirical investigation of whether Good Jobs exist into two parts. The first will consist of an overview of the empirical literatures related to the efficiency wage and to the existence of firm fixed effects in worker-firm data estimations of wage equations. I will argue that these literatures provide some evidence that seems, assessed through common sense, to suggest the existence of Good Jobs; in particular, finding that workers moving into and out of firms that pay high wages get similar sized wage increases and wage cuts, respectively. But those observations could still fit with the wage premiums being related to match specific productivity effects, bond posting, or compensating differentials. In the second part, I will turn to evidence from papers by Paul Beaudry, Ben Sand, and myself as well as papers by Jeanne Tschopp which focus on the theoretical implication that the wages paid by other firms should affect the wage in any specific match if Good Jobs exist (Beaudry et al(2012, 2014), Tschopp(2014)). We find that such spillovers exist and are sizeable. We provide a strong over-identification test the results of which fit with models in which outside options play a significant role.

From the empirical discussion, I conclude that Good Jobs do exist and that they can have potentially substantial effects on the wage structure - certainly much more substantial than standard decomposition approaches which ignore general equilibrium effects would suggest. In the last section, I discuss the implications of these results. I

pursue that discussion primarily in relation to theories of justice. In a CPP lecture in 2014, I argued empirical economists have a role to play apart from the evaluation of the efficiency of public policy programmes in helping to assess the justice of a society and what can be done to improve it (Green(2014)). The existence of Good Jobs is a case in point. As I will argue later, Good Jobs in a full model of the economy must involve both a surplus to the job match for the marginal worker and the worker getting at least part of that surplus. In that case, there will be workers who want the Good Jobs but can't get them. If such jobs exist then their distribution is essentially a matter of luck and how that luck is distributed will be central to perceptions of the fairness of a society. On the other side, if Good Jobs do not exist and wages equal the value of marginal product then we revert to discussions of pre-market luck - the luck of being of a certain ability or being born to a certain family - in determining the justice of a society. Both luck and the consequences of wages equalling the value of marginal product are central concepts in theories of distributive justice. In addition, since Bad Jobs have characteristics that imply a deficit of social and self respect, their existence is also integrally related to these theories. As a result, empirical economists, to the extent we can provide evidence for or against the existence of Good Jobs can play a role in what I call the Rawlsian political economy exercise of comparing institutions to theories of justice.

Finally, I will bring the empirical and theoretical observations together with the considerations from theories of justice. My interest is in whether there is a case to be made for using policy to induce firms to follow Good Job practices or to attract Good Job firms. The kinds of policies I have in mind are ones which mandate firms to provide better pay or working conditions or which seek to attract Good Job firms. I see these policies as a potential means to improve the welfare of workers separate from human capital policies or direct transfers or insurance based schemes. The question at hand is whether there is a place for policies that seek to directly affect worker wages and working conditions as an alternative approach to improve welfare.

## 2 Good Jobs and Economic Models

In this section, I will consider various economic models of wage setting in order both to arrive at a more precise definition of Good Jobs and to derive testable implications of the existence of Good Jobs. My interest is ultimately in whether for the purposes of policy making and, as I will discuss later, in the context of theories of justice there is a reason to try to support or attract Good Jobs. I am interested in this as an alternate

channel for affecting the wage and income distributions separate from human capital based approaches and from tax and transfer approaches.

## 2.1 Neoclassical Models

It is useful, I think, to start by considering wage variation within the most ubiquitous of models: a standard demand and supply model. Of course, in the context of that model, if workers and jobs are homogeneous, there is no variation. All workers are paid their common value of marginal product. We can introduce wage variation into the model in a number of ways. One route is through compensating differentials related to pleasant or unpleasant features of a job. Alternatively, wage differentials could correspond to the wages needed to compensate a worker for investing in skills specific to the industry, occupation or job. Yet another possibility is offered by a Roy model of job selection in which workers are endowed with different abilities in different jobs which interact with firm demand for those abilities to generate an equilibrium set of wage differentials.

Do the high paying jobs in this model correspond to what would commonly be called Good Jobs? The answer is clearly no. Good Jobs, in common parlance, are ones which workers would feel lucky to get, i.e., ones they would happily trade in their current job to get. But in a competitive model, workers, at the margin, are indifferent between their current job and other options. Some jobs may be more pleasant in terms of hours flexibility and general work-life balance but those benefits are exactly balanced by a lower wage compared to less pleasant jobs for the marginal worker. Similarly, substantial occupational differentials are permissible in a Roy model equilibrium but the marginal worker of each ability level would not choose to switch occupations, nor would anyone else. Of course, high school drop-outs would feel lucky if they could get a high paid lawyer job but I view that as unattainable envy rather than something on which one might build labour market policies. Put a different way, the drop-out's inability to get a job as a lawyer is based on luck in the lottery of pre-market ability while I view Good Jobs as being related to luck within the labour market.

This discussion suggests two key points. First, that Good Jobs are not simply high wage jobs since high wages may just compensate for other costs. I don't think workers would view high pay that is related to working in a workplace with asbestos as defining a Good Job. Following from that point, Good Jobs are not necessarily high human capital jobs. They could have a feature of high training content if the market for human capital is imperfect such that the pay in a high training firm more than compensates the marginal

worker for her part of the training investment. But I want to focus on the question of whether it is a good idea to support or attract Good Job firms separately from human capital policy. For that reason, I will think of defining Good Jobs while holding worker skills constant.

This raises the second point: that Good Jobs are assigned by luck. By that I mean, they are not associated with allocations based on what a worker deserves since they are not assigned or remunerated based on differences in skill or as compensation for some feature of the job. Luck, here, does not have to refer to a random allocation such as from a lottery but could correspond to the "luck" of being from a family that has specific access to these jobs or the "luck" of being born male instead of female.

Given these considerations, I can set down the first elements of a definition of Good Jobs. In particular, consider a set of workers,  $W$ , all of whom have the same vector of skills and the same preferences, and a set of jobs,  $J_W$ , that are accessible to those workers, that is that have skill requirements that the workers already meet or could meet under human capital investments that the combination of the worker and the firm would find worthwhile. I will say that a job in that set is a Good Job if at least one worker in  $W$  would strictly prefer that job to her current job but cannot get it under an assumption that all workers have access to credit markets at the standard market rate of interest in order to fund human capital investments.

This definition highlights that Good Jobs have an element of luck associated with them and that they are a concept that can be divorced from human capital issues. Defining Good Jobs in this way does not preclude a desire to redistribute worker income even if Good Jobs do not exist. Rather, it serves to highlight a specific class of jobs which, if they exist, may imply different conclusions about justice and policy.

## **2.2 Models with Good Jobs**

There are plenty of standard models within which Good Jobs do exist even in equilibrium. Considering those models can help us in refining our definition of Good Jobs as well as help us to think about why they might exist, how to identify whether they exist, and what their consequences are for policy.

### **2.2.1 Efficiency Wage Models**

The discussion of Good Jobs as ones that have high wages and good working conditions but also require extra effort from the worker (Tan(2014)) immediately brings to mind

efficiency wage models. There are various forms of efficiency wage models and the specific form will matter for us, but it is useful to start with perhaps the most prototypical model: the Shapiro-Stiglitz model of shirking (Shapiro and Stiglitz(1984)). The fundamental idea in this model is that workers can improve productivity through effort but effort is both costly to the worker to provide and costly for the firm to monitor. Thus, there is an opportunity for workers to pretend to provide effort and collect the wage associated with high productivity but actually not to provide effort (to shirk). The point in these models is that firms can potentially solve the shirking problem by offering a combination of a wage above the market-clearing wage and a threat to fire the worker if he is ever caught shirking. The idea is that the high wage relative to the worker's alternative options provides an incentive not to get caught by not shirking in the first place. Of course, if all firms adopted this approach then there would be no wage differences across firms and workers would not be afraid of getting caught and having to move to another firm. But the higher wages will imply less employment and, as a result, some workers will be involuntarily unemployed. That is, they would prefer to be employed at the going wage but cannot find a job. The key is that wages are set in order to optimize effort and are not a function of the amount of labour supplied. Unemployed workers can offer to work at a wage below the going wage but firms will not take them up on that offer because the workers cannot credibly commit to providing effort at the lower wage.

In the context of this model, all jobs are Good Jobs. That is, they are all jobs that workers of a given skill level would strictly prefer to their main alternative (being unemployed). In that sense, these models are focused where the main policy discussions have traditionally focused: on employment levels. But my focus is different: on the composition of employment. Bulow and Summers(1986) adapted the Shapiro and Stiglitz model to employment composition by redefining the two key states as the primary labour market and the secondary labour market rather than as employment and non-employment. They build on the Doeringer and Piore model of Dual Labour markets, defining primary sector jobs as jobs with good pay, good benefits and job ladders internal to the firm. Secondary sector jobs have lower pay, no benefits, no opportunities for advancement and high turnover. In Bulow and Summers(1986), these sectors are associated with different industries where there are differing costs of monitoring shirking and/or differing effects of shirking on production. Firms in high monitoring costs industries will pay high wages and threaten to fire any worker caught shirking in order to induce effort. The secondary sector clears as a spot market with workers paid their value of marginal product. As in the Shapiro-Stiglitz model, workers are homogeneous and those who are in the lower

state (a secondary sector job in this case) would strictly prefer to be in the higher state (primary sector job). They would, in fact, be willing to pay for a primary sector job but aren't allowed to because of the effort related constraint.

Primary sector jobs fit with what would broadly be defined as Good Jobs and they have two key features. First, they are associated with a match in which there is a positive surplus relative to the outside options of the firm and the worker. Here, even if there is free entry of firms so that firms in both sectors are earning zero profits, there is a surplus for workers in the primary sector relative to their outside option (employment in the secondary sector). But the second feature is that workers also need to get a share of that surplus - otherwise it is just a high wage job but not a Good Job.

The question of workers' share of the surplus is important because it relates to a key critique of the shirking based efficiency wage models. Carmichael, in a series of insightful papers, argued that unemployed workers in the Shapiro-Stiglitz world (or, equivalently, secondary sector workers in the Bulow and Summers world) would logically bid for the good job by offering to post a bond (Carmichael(1985,1990)). In effect, workers would pay for the Good Job up front. Once on the job, they would still be paid a higher wage so that, with the up-front payment being sunk, they would still have an incentive not to shirk. But, importantly, the firm would set the up-front payment to extract all the surplus from the match. In this case, Good Jobs would appear to exist in the sense that there would be jobs with high wages and low turnover but workers would actually be indifferent between having or not having those jobs once the up-front payment is taken into account. In essence, that payment puts us back in something like the standard neoclassical world where there is no reason to subsidize the primary sector firms or regulate the secondary sector ones.

But as Beaudry(1994) points out, the conclusion that firms will extract the whole surplus depends on the information structure. In particular, he sets up an efficiency wage type model incorporating the plausible assumption that workers do not know the productivity type of firms. In his model, a firm can get a good output outcome or a poor outcome, with the probability of a good outcome being a function of worker effort and whether a firm is a high or low type. In high type firms, added worker effort has a larger impact on the probability of the good outcome. Both types of firms want to offer an incentive for workers to provide effort but high type firms want to signal their type because doing so can allow them to elicit extra effort. In this context, if firm types were perfectly observed, the high type firm would charge a larger payment up front (to extract its larger associated surplus) and pay a larger relative bonus if the good output

state occurs. But with uncertain firm types, the low type firm would happily offer the same contract since it gets the extra effort, gets the larger initial payment and has a lower probability of having to pay out the bonus in any case. In essence, in order to signal its type, the high type firm has to offer contracts in which it allows workers to keep some of the surplus - enough so that it isn't worthwhile for the low type firm to adopt the same contract. With workers capturing part of the surplus, we would again define the high type firms as Good Job firms. Ultimately, whether high wage jobs are Good Jobs, even among homogeneous workers, is an empirical question.

There are two other main types of efficiency wage models. In the first, jobs are seen as gift exchanges in which workers are willing to provide more effort if firms offer jobs that are seen as fair, i.e., paying a good wage and with good working conditions. Support for this notion is found in empirical papers such as Mas(2006) who argues that final offer arbitration in bargaining with police unions involves as good as random selection of the union's versus the city's offer. Mas shows that when police unions lose in arbitration (getting a worse outcome than their submission to the arbitration which is presumably their notion of a fair offer), they respond with lower effort as measured by outcomes such as arrest rates in the following year. In Akerlof and Yellen(1990), workers of different skill types base their notion of a fair wage on an average of a market clearing wage for their own skill type and the wages of other skill types at their firm. Payment at or above their fair wage leads workers to provide full effort while effort declines with the extent to which the offered wage falls below the fair wage. They show that with two skill types, the high skilled workers will provide full effort and have full employment while low skill types will be paid a wage above the market clearing wage in order to elicit full effort. Firms will reduce employment of low skilled workers to the point where the value of their marginal product equals the wage they are being paid. The result is a surplus to low skilled employment matches as there are low skilled workers who want these jobs at their existing wages but can't get them. In this case, though, firms cannot extract the full surplus by demanding that low skilled workers post a bond because that would imply that the overall job offer is not deemed as fair and effort would not be forthcoming. In addition, if skills are not too complementary in production then one possible equilibrium involves the emergence of a second set of firms who employ only low skilled workers. Without high skilled workers in the firm to affect the perceived fair wage, these firms can pay the market clearing wage. Thus, this model provides an alternative mechanism for generating a Dual Labour market with good primary jobs paying fair wages and bad secondary jobs paying a spot market wage.

The other main type of models are models of adverse selection in which workers differ in productivity in ways that are difficult for firms to observe. Firms post wages and then select workers from the set of applicants for the job. Under an assumption that worker outside options and their productivity are positively correlated, firms that post higher wages get longer queues of applicants with higher average ability in the queue. Assuming firms can screen workers for ability perfectly once they apply for the job, a firm posting a higher wage can ultimately hire more able workers whose productivity justify the higher wage. This model is fundamentally different from the earlier ones because of the key role played by worker heterogeneity. In the other models, one could entertain worker heterogeneity but the main mechanism operates even with homogeneous workers. In those models, getting the Good Job is a matter of luck since there is no feature of a worker that makes her more deserving of the job in terms of productivity or preferences. In the adverse selection model, the workers who get the higher wage are the ones who deserve that wage by virtue of their higher productivity. That is, the jobs are not Good Jobs in our sense - jobs that equally productive workers would strictly prefer to their current state but cannot get. Of course, if firm screening of applicants is less than perfect then the hired workers are only more able on average. There could be some less able workers who get the job and are simply lucky, i.e., who get a surplus because of free-riding off their more talented co-workers.

### **2.3 Models with Frictions**

Another major class of models with surpluses to matches is search models. In the classic Diamond-Mortensen-Pissarides (DMP) model, unemployed workers and firm vacancies meet according to some matching function. Importantly, there are frictions in the labour market that imply that they meet less than instantaneously, and the time taken to secure a match implies costs that must be matched with a flow surplus once the match is made. Given the frictions inhibiting finding an alternative match, both the worker and the firm would rather continue with the existing match and, in the standard model, they bargain a wage that acts to split the surplus between them. The wage reflects a bargaining power parameter but also the relative values of their outside options. Changes in the remainder of the market or in policies affecting the value of unemployment will alter the outside option of the worker, implying an increase in the wage when that option increases in value.

In these models, the frictions allow for the co-existence of firms with different pro-

ductivities, as long as those productivities exceed the value of unemployment for the worker and the value of any outside options for the firm, i.e., as long as matching with workers implies a positive surplus. The one key constraint is that there must be some restriction on firm entry at the various productivity levels and/or some decreasing returns component to production, otherwise the highest productivity firm type would take over the market. Some combination of these restrictions seems to be true in the real world given that recent researchers have formed a common opinion that firms with different productivity levels do co-exist in the same industries and locations (Syverson(2011)).

Given variation in firm productivity, workers will bargain different wages with the different productivity firms. Importantly for us, frictions slowing down search by workers will mean that those who match with lower wage/productivity firms will stay with their match but would prefer to be in a higher productivity firm, i.e., will see those as good matches. And there is no way for the workers at lower productivity firms to pay to get access to higher productivity matches because they can't find those matches easily.

An interesting specific example of this type of model is found in Daron Acemoglu's paper, "Good Jobs versus Bad Jobs" (Acemoglu(2001)). In this model, firms employ a combination of capital and labour to produce two different outputs differentiated by their levels of capital intensity. The labour market is modeled as a standard DMP model and so workers bargain different wages with each type of firm. Those wages essentially reflect a capital hold-up problem, with the more capital intensive sector paying higher wages. For that reason, Acemoglu terms the capital intensive sector the "good jobs" sector and the less capital intensive sector the "bad jobs" sector. Again, both types of jobs can co-exist because there is no mechanism for workers to bid for good jobs. There are surpluses in both jobs relative to the worker value of unemployment, and workers are able to capture a share of those surpluses through the bargaining process. As a result, all jobs fit our definition of Good Jobs, suggesting a need for a refinement of our definition. In particular, rather than classifying jobs into two types, good and bad, we can think in terms of a continuum of jobs with some being more desirable than others. We can broadly classify the best paying jobs as what most people in the economy would define as Good Jobs but I won't try to select out a specific group of industries or jobs for that designation. More generally, workers care about the composition of jobs, preferring some jobs to others - something that doesn't arise in a standard neoclassical setting or in efficiency wage models where workers can pay to get access to specific jobs.

One important conclusion from the Acemoglu model is that the economy generates an inefficiently small number of Good Jobs. Essentially, there is an externality to the

creation of those jobs as embodied in the purchasing of the associated capital because entrepreneurs do not take account of worker preferences for Good Jobs. I will return to this point when I consider the implications of Good Jobs.

The conclusion that models with search frictions imply Good Jobs (or, a continuous ranking of jobs based on the surplus a worker gets on each job) depends on the nature of the wage determination process. In DMP style models, there is an exogenous wage bargaining process that sets the wage in such a way that workers, in general, get part of the surplus. But this conclusion may not follow in wage posting/directed search models. In those models, firms post a wage and workers can choose where to apply. Higher posted wages increase the likelihood a firm gets a worker but at a cost. In general, such models with firm heterogeneity will lead to a wage outcome similar to that in the DMP model and, in particular, will again result in workers capturing part of the match surplus. The same is true of Burdett-Mortensen style on-the-job search models (Rogerson et al(2005)). But there are variants of both of these classes of models in which firms extract the whole surplus. If, for example, there is a restricted number of firms that is less than the number of workers so that firms end up with multiple applicants per job then firms could auction off the job among the applicants. If the applicants are homogeneous in terms of their values of home production then the result will be a wage set at the flow value of home production, i.e., so that the firm captures the entire surplus. In the context of on the job search models, Stevens(2004) introduces a model with wage-tenure profiles in which workers pay for jobs much as in the efficiency wage literature. Thus, whether Good Jobs exist is again an empirical issue.

### 2.3.1 Unions

Union jobs are often what come to mind when people discuss Good Jobs: they are highly paid, secure, and typically have other associated benefits. We can think of union jobs in ways that are similar to both of the main classes of models we have discussed so far. In a standard model of wage and employment setting with a union, once a firm becomes unionized it is legally restricted to getting its workers through the union.<sup>1</sup> This raises the possibility of unions acting to extract rents from the relationship. Indeed, in one common model of union preferences, unions set out to maximize rents: the difference between the wage bill and the wages the workers would get in their best outside option.

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<sup>1</sup>See, for example, MacDonald and Solow(1981) and MaCurdy and Pencavel(1986) and, in a Canadian context, Martinello(1989) for expositions of models of wage and employment determination in the presence of unions.

Whatever form union preferences take, the union will attempt to maximize the welfare of their members subject to constraints implied by the firm acting to maximize profits. The result will be a set of feasible wage and employment combinations, with the union and the firm bargaining over the specific choice from that set.<sup>2</sup> We often assume this will lead to a decrease in employment at union firms, though whether this is true depends on the values of outside options and relative bargaining power as well as whether employment and wages are bargained jointly or whether the union and firm only bargain the wage, allowing the firm to pick the employment level. But regardless of employment outcomes, the wage will typically be above the outside alternative wage and, in this sense, union jobs are Good Jobs. This is similar in nature to efficiency wage models where restrictions on employment generate a surplus to be divided. Unlike in those models, it is unlikely that firms will be able to capture the whole surplus by requiring workers to post a bond since the whole *raison d'être* of the union is to capture surplus.<sup>3</sup> It is possible, though, that the union leadership or previous members manage to capture all the rents by requiring new joiners to pay in some way. In addition, as in efficiency wage models, we could consider a variant in which higher union wages induce a queue of applicants and firms are able to select workers whose productivities justify the higher wage from the queue (Hirsch(1993)). Alternatively, Duncan and Stafford(1980) conclude that get more out of their workers by increasing the pace of work, allowing fewer breaks, etc.. This may occur to an extent that extracts all the rents. In any of these cases, union jobs are not Good Jobs defined in the sense that the marginal worker strictly prefers this job to his outside option.

Wage and employment in the presence of unions can also be viewed in the context of search models where, in this case, the frictions are actually generated by the union. Alternatively, Tashcereau-Dumouchel(2012) considers a DMP style model with unions. In this model, there are frictions that imply a surplus to any match between workers and firms. Once a set of matches is made, workers at a firm vote on whether to become a union and then bargain wages. In a non-union firm, workers bargain individually with firms and the loss the firm faces if the bargaining breaks down is the loss of the value

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<sup>2</sup>Empirical results have tended to reject the pure rent maximization model, showing that the outcome does reflect unions placing some weight on the wage rent but also more weight on employment than would be implied from a pure maximization model (MaCurdy and Pencavel(1986), Martinello(1989)).

<sup>3</sup>Doiron(1992) estimates a structural model of union wages and employment using data from the BC wood products industry. A key part of her analysis is an estimation of the relative bargaining powers of the union and the employers' association, with those bargaining powers written as functions of observable variables such as interest rates and unemployment. She finds that firms capture, on average, 84% of the rents in her data.

of the marginal product of that worker. In a unionized firm, the threat the union makes is to remove all the workers from working which costs the firm its total output. Unions are then assumed to divide what they bargain for evenly among all their members. In that case, skilled workers (who have a high personal value of marginal product) will vote against the union at the outset of the match and unskilled workers will vote for it. Firms that face a high cost of unionization will open more vacancies for high skilled workers in order to try to attract a workforce that will vote against a union. In this model, unions do not generate the initial surplus (though their actions will lead to a reduction in employment) but rather organize workers in order to have more bargaining power in the division of the existing surplus. This idea that unions work to capture existing rents is related to findings that union wages are higher in regulated and resource sectors (e.g., Rose(1987), Hirsch(1993), and Hirsch and MacPherson(2000)). As in the search and bargaining models, there is a continuum of bad, good, and better jobs which, in this case, correspond to the relative bargaining power of the union.

## 2.4 Implications from Theory

My brief discussion of Good Jobs in the context of theories of the labour market points to several immediate implications. The first is for the definition of what constitutes a good job. In essence, a good job must be one on which there is a surplus at the margin, with the worker sharing in that surplus to some extent. Competitive models may generate a surplus for infra-marginal workers but by my definition, a job is only viewed as Good if there are workers outside the match who would strictly prefer to be in it. Without that, there is no reason to think about expanding the number of Good Job firms through policy. Thus, we can define a Good Job as a job in the feasible set for a set of skill-homogeneous workers that at least one of the workers in the set would strictly prefer to her current situation because it has associated with it a surplus for the marginal worker in the firm that the worker would share. As before, I would add the addendum that that all the workers in the set have access to credit markets at the standard market rate of interest in order to fund human capital investments so that it is clear that what is being discussed is something other than human capital related issues.

The second implication from our discussion is that there are numerous models in which Good Jobs are a natural part of the equilibrium in the economy. It is not hard to find models which point to the desirability of subsidizing certain jobs - Good Jobs.

Third, those Good Jobs arise when there are imperfections in the market. In the

Shapiro-Stiglitz model without bond posting, workers are simply assumed not to be able to equalize their marginal utility across different states and the labour market is in an inefficient equilibrium. With bond posting, this is no longer the case. Indeed, with bond posting plus constant returns to scale and/or free entry of firms, there is no surplus at all. In the Beaudry(1994) model, the imperfection relates to an information asymmetry. In Akerlof and Yellen(1990), there is a restriction on preferences that implies that the labour market will not clear. In the adverse selection model, the imperfection is again about information and, in this case, has a direct embodiment in the imperfection of the screening mechanism. In the DMP models, search frictions are key while in wage posting models, we again need to assume away the posting of bonds to conclude that there are Good Jobs. This point that Good Jobs and market imperfections go together will be important when we consider policy implications of Good Jobs in the last section. But my immediate point is that while the gut reaction of economists is to reach for the competitive model and conclude that there is no such thing as Good Jobs, in fact we need to be in a rarified world without market imperfections for that to be the case.

To the extent that market imperfections are important, we would expect their effects to show up in more direct manifestations as well. Rents created in regulated industries, for example, can be the basis of Good Jobs to the extent that workers are able to capture a share of those rents. As an example, Rose(1987) examines the deregulation of the heavily unionized trucking sector in the US and concludes that deregulation resulted in a substantial drop in the union wage premium in that sector. She argues that this fits with a model of union rent sharing. Similarly, resource rents could be the source of Good Jobs; again, to the extent that unionization or simply search frictions allow workers to extract part of the rent. From this it is clear that the policy implications of Good Jobs will depend on the source of the underlying rent.

Fourth, it follows from the third implication that whether Good Jobs exist is an empirical question. The question of whether Good Jobs exist in the models I have considered comes down to the empirical questions of whether workers pay for jobs, what is the nature of information asymmetries in the real world, and whether wage posting or wage bargaining is a better way to see the wage determination process. This list of questions suggests that answering them is not easy. For example, one could (as many authors have) point to the lack of explicit examples of workers directly paying for jobs or posting bonds at the outset of jobs as evidence in favour of models with good jobs. But others have argued that job ladders with positive wage gradients are the effective embodiment of such payments: workers take lower pay at the outset and rising wages

with time in the firm as a way of paying up front for the job. Trying to identify worker and firm information sets or which mechanism written down to describe wage setting in the economy does a better job of it is even less likely to be successful. Alternatively, one might consider looking for evidence for these types of jobs by looking for variation in wages while holding worker productivity constant. But as Carmichael(1990) points out, wages and productivity are positively correlated in efficiency wage models just as they are in standard neoclassical models (though for opposite reasons). The end result is that there appears to be little hope to directly test whether Good Jobs exist when considering the world through the lens of these models. I will argue in the next section, though, that we can work with indirect implications to determine the existence of Good Jobs.

Fifth, a perhaps less obvious implication from the models with Good Jobs is that there are spillovers in wages across jobs. In Acemoglu(2001)'s model, for example, an increase in wages in the Good Jobs sector and/or a shift in composition toward having a larger proportion of jobs in the Good Jobs sector implies a higher value to being unemployed. This arises because unemployed workers search randomly across jobs and as the expected value of that search increases then so must the value of unemployment. The implication of this is that even the wages bargained in Bad Jobs must rise. This is a general implication of DMP models with multiple sectors (Beaudry et al(2012)). The same kind of logic holds in Shapiro-Stiglitz type models where wage improvements in one sector would raise the value of unemployment and force an increase in the no-shirking inducing wage in all sectors. In the fairness based efficiency wage models, we get the same result but much more directly: if wages increase for a job in the relevant comparison group for job x then wages in job x must increase to re-establish perceptions of the fairness of the job. We will return to this point as part of trying to test for the existence of good jobs in the next section.

Sixth, the models we have been considering reduce the qualities of a job simply to its wage. But the Good Jobs described in Ton(2014), and likely in the public consciousness, entail much more than a good wage. They are jobs where workers feel respected, have predictable hours, finding meaning in their work, and have opportunities for advancement. In addition, they are likely jobs on which workers feel they have a voice about workplace characteristics and an mechanism through which they can effect change. In this sense, there is scope for learning from the union literature on policies related to worker voice on the job.

### 3 Do Good Jobs Exist?

Interest in whether there are really such things as Good Jobs has led to a large set of empirical investigations. While various approaches have been used, the main body of investigations can best be described using the following regression:

$$w_{ijt} = x_{ijt}\beta_j + \theta_j + u_{ijt} \quad (1)$$

where,  $i$  indexes individuals,  $t$  indexes time, and  $j$  indexes sectors defined either as industries, occupations, firms, or union status;  $x_{ijt}$  is a vector of characteristics of the sector and the individual which could include individual fixed effects;  $\beta_j$  is a potentially sector specific parameter vector; and  $u_{ijt}$  is an error term.

As pointed out effectively in Gibbons et al(2005), the method for obtaining consistent estimates of the  $\theta$ 's depends on assumptions about the observability of the  $x$ 's, on the nature of how abilities and preferences vary by sector, and on the underlying sector selection model. In the simplest case, the  $x$  vector contains all the factors that could affect the wage in a competitive model: individual productive characteristics and characteristics such as the level of safety on the job that determine compensating differentials. In addition,  $\beta_j = \beta$ , so that abilities are equally valued across sectors, and  $u_{ijt}$  is independent of all right hand side variables (including the sector dummy variables), implying that there is no selection on unobservables across sectors. If all of these assumptions hold then we can get consistent estimates of the  $\theta$ 's and  $\beta$ 's by OLS. In that context, if we find that there are still systematic differences in wages across sectors even after controlling for the  $x$  vector then we can say that there are Good Jobs in a wage sense, that is, jobs with the same features as other jobs and held by workers with identical productive characteristics that pay higher wages.

Many papers estimate this type of regression by OLS for various definitions of sectors, typically finding that controlling for individual characteristics such as education and experience reduces differences in average wages across sectors considerably. For example, Gibbons et al(2005) find a standard deviation of average log wages across industries in the US of 0.15 when not controlling for any covariates and a standard deviation of 0.11 in an OLS regression in which they also control for gender, union status, year, occupation and a skill index related to education and experience. Similarly, using data from the November 2014 Canadian Labour Force Survey, the raw difference in log wages between workers covered by a union agreement and nonunion workers is 0.24 log points while the difference once we control for a complete interaction of detailed age and education categories,

province and gender, the differential is reduced to 0.18 log points. The inclusion of more extensive sets of controls does not tend to eliminate these sectoral differences (e.g., Gera and Grenier(1994) for industry differences in Canada, Krueger and Summers(1988) for industry differences in the US).

The fact that controlling for worker characteristics does reduce the spread of sectoral differentials implies that workers sort across sectors. If the same sorting occurs in terms of unobservable (to the researcher) productive characteristics then the assumption that  $u_{ijt}$  is uncorrelated with the right hand side variables in 1 will be violated and OLS will provide inconsistent estimates. In essence, we will not know whether the estimated sector effects reflect Good Jobs or just a collection of good workers. We can address this issue using fixed effect or first difference estimators if we assume that the unobserved productive characteristics can vary across people but are time invariant and are equally valuable in all sectors. This ultimately involves estimating the  $\theta$ 's based on the wage changes observed when workers move between sectors. This approach has been used to estimate industry effects (e.g., Gera and Grenier(1994), Krueger and Summers(1988)). Gibbons et al(2005) find that this approach reduces the spreads of either occupation or industry differences by at least 50%. Similarly, Lemieux(1993) shows that fixed effects estimates of union effects on wages in Canada are substantially smaller than OLS estimates. More recently, this logic has been the basis of attempts to estimate separate worker and firm fixed effects from matched worker and firm data. Using French data, Abowd et al(1999) find that worker specific effects explain more of the total variation in wages across workers than firm effects but that firm effects are still important. Interestingly, they find that they can fully account for variation in average wages across industries with individual effects. In other words, the evidence that others have presented for the existence of Good Jobs (that industries pay different amounts for workers with the same observable characteristics) does not stand up, at least in French data. On the other hand, the fact that there are firm effects - i.e., that when workers move to certain firms their wages increase even while controlling for persistent worker characteristics - is potentially evidence in favour of the existence of Good Jobs.

The fixed effect estimates of the  $\theta$ 's, however, face two main challenges. First, in terms of the firm effects estimates, Postel-Vinay and Robin(2002) argue that we need theory to interpret what the fixed effect estimates are actually estimating and that once one takes account of on-the-job search the Abowd et al(1999) approach over-emphasizes the importance of individual effects. Postel-Vinay and Robin(2002) find that firm effects account for approximately 40% of wage variation for low skilled occupation workers and

about 20% for high skilled workers. This, again, suggests the existence of Good Job firms. But theory can speak in different ways, and Eeckhout and Kircher(2011) argue that in a matching model, there is not necessarily such a thing as a good firm - only good matches. That, essentially, our current techniques do not take account of the notion that productivity could be non-linear in firm or worker skill characteristics. A firm that requires high amounts of skill in its tasks may be a low productivity place to work for a middle skilled worker but a high productivity workplace for a high skilled worker.

This latter point raises the second main concern with the firm fixed effects estimates. Namely, that both the Abowd et al(1999) approach and the Postel-Vinay and Robin(2002) estimates rely on an assumption that workers are exogenously sorted across firms. Once we allow for a more realistic model of sector selection - along the lines of a Roy model, for example - identifying firm or sector effects becomes much more complicated. In a rich version of the Roy model, workers possess a vector of abilities corresponding to each sector. Equilibrium will correspond to a vector of ability prices that result in the workers being sorted across sectors in such a way that no worker wants to move. Observed average wages in a firm or industry will reflect both the average sector-specific ability of the workers employed there and the relevant ability price. In this situation, as discussed in Gibbons et al(2005) in the context of a specific (though relatively flexible) ability specification, standard estimators for addressing selection biases are of limited usefulness. Since workers move to their optimal sector when they move, one cannot maintain the exogenous sorting assumption needed in fixed effect methods. Because of heterogeneity in ability, writing out the error term in full reveals that it includes the sectoral dummy variables, so instrumenting for dummy variables is also not a viable approach. Gibbons et al(2005) propose and implement a non-linear IV strategy that addresses these issues and continue to find evidence of industry effects (though less evidence of occupation effects).<sup>4</sup> The difficulty, though, is how to interpret those effects. As Gibbons et al(2005) state, they could still reflect compensating differentials or other kinds of rents. Just as importantly, the estimated sector effects in any successful approach to addressing selection in a wage equation will capture the wage differential for a randomly selected worker. But the question of whether there are such things as Good Jobs - that is, of whether there is a surplus for the marginal worker - is not about the differential for a randomly selected worker. In a famous example, Adam Smith argues that executioners need to be paid a higher wage to compensate for the shame of their occupation. But suppose there are sadists who would actually pay to do the job such that

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<sup>4</sup>Lemieux(1998) takes a similar approach to estimating union effects and finds positive wage effects.

the observed average (equilibrium) wage differential between executioners and workers with the same productive characteristics in another occupation is negative. A successful implementation of a selection correction would recover a positive wage differential for a typical citizen but that does not tell us whether there is a surplus at the margin - whether being an executioner is a Good Job.

In a recent important paper, Card et al(2013) implement the Abowd et al(1999) methodology using German data. Perhaps of most interest for this discussion is a series of tests they implement to examine the potential importance of match specific effects, i.e., to test whether the Abowd et al(1999) approach can provide consistent estimates of firm effects. They find some evidence of match specific effects but interpret those effects as explaining about 1/3 of the variation captured by firm specific effects. This implies that there are potentially such things as Good Jobs rather than just good matches. They find that both firm and worker effects are important for explaining overall wage variation, with worker effects showing somewhat larger variation. In addition, the importance of both types of effects and their covariance has grown with time and that growth plays a significant role in explaining increases in German inequality. The interesting question is whether these results would also hold in a labour market like Canada's where there is not a large scale apprenticeship system and educational streaming through which workers are matched to sectors. One could imagine that with those systems, factors that confound attempts to identify firm effects in their framework (including learning about ability and searching out matches) could be less important than they might be in Canada.<sup>5</sup>

One could, in principle, estimate a complete model of wage equations and sector selection equations. With the parameters from such a model, we could construct counterfactual wages for each worker, i.e., the wages they would receive in each sector they did not actually enter. From those, we could then see if there are sectors that everyone would prefer but only some enter. The main problem with this approach is the very

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<sup>5</sup>In addition, there is some reason for caution in rushing to the conclusion that their test results imply little in the way of good specific matches. Their test consists of comparing the sum of squared residuals from a specification with additively separable worker and firm effects (i.e., one without good specific matches) with the sum of squared residuals from a fully-saturated specification which includes a complete set of dummies for each worker-firm match in the data. They interpret the fact that the first sum of squared residuals is close to the second as evidence that good matches are not an important component of wage determination. But this argument is similar to running a regression with and without a specific variable and concluding that variable is not of economic importance if the  $R^2$  does not change much. One can say that the fit to the data does not improve with the extra flexibility but if the omitted variable is correlated with the included variables then a conclusion that the omitted variable is not structurally important may not be warranted. In this case, the conclusion that the estimated firm effects in the more restricted regression are true firm effects and do not partly reflect good matches does not necessarily follow.

substantial difficulty of finding enough exclusion restrictions to credibly identify many sectoral wage equations and sectoral selection processes. In addition, one would want to build such a model allowing for the possibility of rents at the margin rather than simply assuming selection is determined by a standard Roy model. Taber and Vejlin(2015) is the only example of trying to do this of which I am aware.

An alternative possible approach is to take advantage of plant closings (Krueger and Summers(1988)). When we use typical sectoral transitions in longitudinal datasets, our concern is that the people who move are not random and so what happens to their wage does not reveal the firm or sector "type". But if a plant is suddenly closed and all its workers thrown out of work then the resulting wage changes could be seen as plausibly exogenous relative to the surplus in the initial sector. If sectoral sorting were truly described by a Roy model then for the marginal worker, his or her next best alternative will be only marginally worse than in the plant that's closing. If we see his or her wage fall significantly then this would suggest a surplus on the closing job. The difficulty is that we can't identify the marginal worker and, so, rely on average wage changes. If there is heterogeneity in sectoral ability then all the workers other than the marginal worker will be getting a surplus in the closing job and we will see the average wage of laid-off workers fall. But this does not necessarily imply the closing job is a Good Job in the sense that there are workers who would prefer to get it but can't. Moreover, a decline in the average wage for the laid off workers could reflect a compensating differential for some characteristic of the closing job. <sup>6</sup> On the other hand, Kuhn and Sweetman(1998)'s finding that wage losses are larger for workers laid off from a union job does seem suggestive of the existence of union related rents.

Still another possibility is to examine wages in relation to features that we view as reflecting the presence of rents for a sector. The results in Rose(1987) and Card(1987), for example, indicate that de-regulation of an industry is associated with a decline in wages for workers. This implies, at the very least, that workers can capture part of rents when they exist. The movement of wages in Alberta and Saskatchewan above those for workers with similar education and experience in Ontario during the recent resource

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<sup>6</sup>Sorkin(2015) uses wage changes from mass layoffs to identify wage options for workers and then argues that moves that involve wage declines reflect compensating differentials. Using this in the context of a model, he identifies the proportion of industry differentials that reflect compensating differentials compared to search related frictions and finds that both are important but compensating differentials explain more of the cross-industry variation. Taber and Vejlin(2015) uses a similar assumption on wage declines to help identify a model that incorporates human capital, search frictions, compensating differentials, and Roy model type selection. He finds that wage variation associated with Roy model heterogeneity is the largest contributor to overall wage inequality for the US.

boom is also suggestive of workers capturing rents - resource rents in this case.

Where does that leave us? Findings that workers moving to some firms enjoy wage increases relative to their typical wage while workers moving to others suffer wage losses is certainly suggestive of there being Good Jobs and the size of wage declines following large plant closings may suggest the same. Common sense suggests that workers moving to the high wage firms are getting Good Jobs and results related to deregulation and resource booms indicate that workers do capture rents when they are available. More importantly, the findings in Card et al(2013) imply that the firm effects may not just be good matches in disguise; at least, in German data. But the tests in Card et al(2013) are not necessarily the last word and, in addition, whether firms identified as having large firm effects in worker-firm data estimation are Good Job firms depends on the source of the effects. If they reflect compensating differentials for unobserved characteristics of firms or are effectively transferred back to firms or unions through workers paying to get the high wage jobs then high wage firms are not necessarily Good Job firms. In the next section, I discuss an approach for obtaining corroborating evidence on whether there are Good Jobs.

### **3.1 Testable Implications of Good Jobs**

In this section, I consider the empirical implications of a key feature of models with Good Jobs: that wages on a job depend on the wages of other jobs the worker could potentially access and, as a result, on the sectoral composition of other jobs in the economy. This arises because wages play a role in dividing up the surplus that we have said helps define a Good Job. As an example, consider construction workers in Edmonton and Moncton in the late 2000's. In bargaining with their employers, the construction worker in Edmonton could more plausibly have used the good wages he could have received in the oil patch as an important outside option while the worker in Moncton may have had work in Call Centres as his main alternative. In this situation, we would expect the worker in Edmonton to have been able to bargain a higher wage if oil jobs are Good Jobs. But if the higher wage in the oil fields was just a compensating differential for dangerous work then it could not have been the source of Edmonton construction workers bargaining higher wages since the net benefit to the worker of being in an oil job would not have been higher than on his current job. Thus, if we see effects of the composition of employment on wages within all sectors in an economy then it must imply that some of the differences in wages across sectors comes from some of them being Good Jobs sectors. I will derive

this argument explicitly in the context of a model with surpluses arising out of search frictions and then discuss it more generally in other Good Jobs models. The discussion here relies heavily on our presentation in Beaudry et al(2012).

Consider a standard DMP type search model with multiple sectors, indexed by  $i$ , and multiple local economies, indexed by  $c$ . I will proceed assuming there is a fixed number of workers,  $L$ , in each city and that they are not mobile across cities. In Beaudry et al(2014), we consider the implications of allowing for worker mobility in detail. The main points raised here are not changed by allowing for such mobility as long as workers cannot move costlessly across locations. The use of cross-city variation is important. What we are interested in are general equilibrium effects and using multiple cities allows us to see different equilibria. Workers are homogeneous in terms of their productivity and preferences so that any variation in wages that arises can be seen as a matter of luck for any given worker, i.e., can be seen as reflecting good and less good jobs.

Firms in the economy have one job each and when that job is filled, produce a certain number of units of an intermediate good which is sold in a national market. The value of the output of the firm is written as the sum of a national level component,  $p_i$ , and a local idiosyncratic component,  $\epsilon_{ic}$ . The fact that the goods are tradeable highlights that we are not focusing on effects through demand for local goods. The workers in the economy can potentially become entrepreneurs and are heterogeneous in their costs of opening a firm in each possible industry in their city. They decide on whether to open a firm by comparing that cost to the value of a vacancy in industry  $i$  and city  $c$ , with entrepreneurs with costs below that value opening a vacancy. This insures that the model does not generate a counterfactual perfect concentration of each industry in one city since even in cities with particularly large values of  $\epsilon_{ic}$  in a specific industry there will be people whose costs of setting up a firm in that industry are too high for them to do so while their costs in some other industry are low. Workers and firms meet according to a matching technology that is a function of the number of unfilled vacancies and the number of unemployed workers in the city as a whole. Unemployed workers engage in a random search across sectors with the probability of them running into a vacancy from a particular industry being a function of the proportion of workers employed in that industry in that city. There is no on-the-job search. Once workers and firms meet, they bargain a wage to divide the match specific surplus. Given that all features of firms vary only at the industry level and workers are homogeneous, there will be one wage in each industry-city cell.

As is typical in these types of models, much of what is important in the model

is encapsulated in the Bellman equations. In particular, for us, the most interesting components correspond to the value functions for workers when they are employed and unemployed. For employed workers, the relevant equation is:

$$\rho U_{ic}^e = w_{ic} + \delta(U_c^u - U_{ic}^e) \quad (2)$$

where,  $\rho$  is the discount rate (common to workers and firms),  $U_{ic}^e$  is the discounted value of being employed in industry  $i$  in city  $c$ ,  $w_{ic}$  is the wage in industry  $i$  in city  $c$ ,  $\delta$  is the exogenous probability that a match ends, and  $U_c^u$  is the value of being unemployed in city  $c$  (the worker's outside option when bargaining). This equation is very standard. It says that the return on the asset of being employed in that industry and city cell can be written as the flow value (the wage) plus a term reflecting the change in the value for a worker if the match ends times the probability it ends.

The comparable equation for the unemployed state, on the other hand, is less standard:

$$\rho U_c^u = b + \psi_c \left( \sum_j \eta_{jc} U_{jc}^e - U_c^u \right) \quad (3)$$

where  $b$  is the flow value of being unemployed,  $\psi_c$  is the probability that a worker meets a vacancy, and  $\eta_{jc}$  is the proportion of city  $c$  workers (and, in equilibrium, of vacancies) who are in industry  $j$ . The probability  $\psi_c$  is a reflection of the search frictions in the market as workers don't meet new vacancies with probability 1 in any instant. The value of being unemployed equals the flow value of unemployment plus the value of the option of finding a job. The worker finds some job with probability  $\psi_c$  and the expected value of that job is a weighted average across the values of jobs in the various sectors with the weights being the proportions of employment in the sectors. Given that 2 shows that the value of employment in a sector depends on its wage, the value of being unemployed is higher in cities with an industrial composition that puts more weight on high wage industries and/or in cities where other industries pay higher wages.

Using 2 and 3, the Bellman equations corresponding to filled and unfilled vacancies, the entry condition for entrepreneurs, and a Nash bargaining set-up for wage determination, we show in Beaudry et al(2012) that the wage in a given industry-city cell can be written as:

$$w_{ic} = \gamma_{c0} + \gamma_{c1} p_i + \gamma_{c2} \sum_j \eta_{jc} w_{jc} + \gamma_{c1} \epsilon_{ic} \quad (4)$$

where, the  $\gamma$ 's are parameters that can be written as functions of fundamental parameters such as the discount rate and the relative bargaining power but also of the probabilities

an unemployed worker meets a vacancy and an unfilled vacancy meets an unemployed worker. Equation 4 says that wages are determined by the value of marginal product ( $p_i + \epsilon_{ic}$ ) but also by the average wage in the rest of the city. Increases in the average wage, as we have seen, increase the value of unemployment for workers in  $c$  which, in turn, implies that the bargained wage within any industry is higher. This is the logic underlying our earlier example with construction workers in Edmonton and Moncton: the construction worker in Edmonton could credibly demand a higher wage because his outside option was to quit his construction job and start an unemployed search that had a reasonably good chance of resulting in a high paid oil sector job. The  $\gamma_{c2}$  parameter reflects the immediate impact of a shift in the composition of employment in the city but this is only the first round of effects. The resulting increase in the wage in industry  $i$  will imply better outside options for workers in other industries as well, which will push up their wages, which will in turn reflect back on industry  $i$ 's wage, and so on. One can show that  $0 < \gamma_{c2} < 1$ , so the resulting process will converge to a total impact given by  $\frac{\gamma_{c2}}{1-\gamma_{c2}}$ .

As it stands, equation (4) has two issues that complicate estimation. The first is that this equation contains a basic reflection problem in that the wage in an industry,  $i$ , in city  $c$  is a function of the average wage across all industries in the city and the wages in those other industries are, in part, a function of the wage in industry  $i$ . One way we respond to that problem is by showing that one can work within the context of the model to replace  $\sum_j \eta_{jc} w_{jc}$  with  $R_c = \sum_j \eta_{jc} \nu_j$ , where  $\nu_j$  is the wage premium in industry  $j$  at the national level.  $R_c$  is not a function of local wages, which helps reduce the endogeneity problem. We call  $R_c$  the average rent in city  $c$  since the wage premia are obtained after controlling for observable characteristics and so are intended to capture rents by industry. Whether they do is the focus of our empirical tests. Returning to our example, Edmonton is a higher rent city than Moncton because its employment structure includes more weight on the high-wage premium oil sector.

The second econometric issue with (4) is that the  $\gamma$ 's are functions of the probabilities of vacancies and workers meeting which, in equilibrium, can be written as functions of the city employment rate. We want to make that relationship explicit and, so, take a linear approximation to (4) around a point where all cities have the same industrial composition. Finally, we think about the problem in terms of differences in steady states over time and work with a first differenced wage equation in order to eliminate industry  $x$  city specific persistent factors. That is, we control for the possibility that Edmonton is perennially less productive in the construction industry because of its winters. From

all this, we arrive at an estimating specification<sup>7</sup>:

$$\Delta w_{ic} = \Delta d_i + \left(\frac{\gamma_2}{1 - \gamma_2}\right) \Delta R_c + \gamma_3 \Delta ER_c + \Delta \xi_{ic} \quad (5)$$

where  $\Delta$  is the difference operator,  $\Delta d_i = \gamma_1 \frac{\gamma_2}{1 - \gamma_2} \Delta p_1 + \gamma_1 \Delta p_i$ ,  $\Delta \xi_{ic} = \gamma_1 \Delta \epsilon_{ic} + \gamma_1 \frac{\gamma_2}{1 - \gamma_2} \sum_j \frac{1}{I} \Delta \epsilon_{jc}$ ,  $ER_c$  is the employment rate in city  $c$ , the  $\gamma$ 's are versions of the  $\gamma_c$  parameters from (4) evaluated at the average employment rate across all cities, and  $\gamma_3$  is predicted to be positive since worker outside options improve and firm outside options decline in a tighter labour market. In Beaudry et al(2012), the first difference corresponds to a change across a decade - between US Census dates - and the  $c$ 's refer to US cities.

There are several features of (5) that I would like to highlight. First, when we implement this specification, we can capture the  $\Delta d_i$  term with a complete set of industry dummy variables. This will imply that the specification allows for a time trend to pick up general changes within each industry over the decade. It also means that the variation used to identify the remaining parameters is across-cities, within industries. That is, our example of comparing construction worker wages in different cities is exactly the thought experiment underlying the estimates. Second, because we control for changes in the employment rate, the  $\Delta R_c$  variable effect is identified by changes in industrial composition. As an example, between 2001 and 2011, the employment rate in Ottawa-Gatineau was virtually unchanged at approximately 66 but the percentage of workers in goods production fell from 13% to 10% and the percentage in public administration rose from 19% to 22%. Since public service jobs are on average much better paid than production jobs, (5) implies that the wages in all sectors in the region should have increased.

One of the main features of the specification in (5) is that it is derived from theory. The theory tells us, in particular, what to include as controls on the right hand side and, since we derive them as functions of deeper parameters, how to interpret the coefficients on those controls. In this case, theory tells us that we want to control for industry effects and that we want to control for the employment rate while estimating the effects of the rent variable - something that will be important when trying to delineate among models. But just as importantly, the theory gives us insight into what is in the error term which, in turn, allows us to understand potential endogeneity issues and the nature of solutions to them. Finally, as we will see, the theory will imply testable over-identifying restrictions and the results from testing those restrictions will determine whether we want to rely on this model for interpreting the data.

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<sup>7</sup>See Beaudry et al(2012) for the precise steps

We refer to this approach as Structural Instrumental Variables. In it, we take the structure of the model very seriously in terms of its implications for covariates, coefficients, and the error term but we do not impose the structure directly on the data since we work with a linearization of the key equation. That means we can use standard IV techniques and appeal to micro-econometric arguments about the sources of identification. The goal is to combine the best features of structural estimation (allowing for meaningful interpretation of results and getting a clear idea of the relationships between observables and unobservables) with the best features of the econometric instrumental variable literature (especially, transparency in terms of sources of identification).

In our case, the error term is a function of the growth in productivity in the industry-city cell and of the growth in average productivity for the city. Our concern, as always, is over whether our right hand side variables,  $\Delta R_c$  and  $\Delta ER_c$ , are correlated with the error term. To see the nature of the potential concerns with  $\Delta R_c$ , note that we can decompose changes in the city rent variable as follows:

$$\Delta \sum_j \eta_{jct} \nu_{jt} = \sum_j \Delta \eta_{jc} \nu_{jct+1} + \sum_j \Delta \nu_j \eta_{jct} \quad (6)$$

where I have introduced a t subscript with t being the year at the start of a decade and t+1 being the year at the end. The decomposition says that changes in the average rent in a city can occur because the composition of employment changes ( $\sum_j \Delta \eta_{jc} \nu_{jct+1}$ ), shifting either toward or away from high paying industries, or because the wage premiums paid by industries change, particularly in industries where the city has some concentration ( $\sum_j \Delta \nu_j \eta_{jct}$ ). Potential difficulties arise because the change in the  $\eta$ 's in the first part of the decomposition will reflect changes in their productivity shocks (the  $\epsilon$ 's) and those changes are in the error term. In that case, changes in the average rent measure for a city will partly pick up general productivity changes but what we are trying to measure is bargaining effects - the effects of changes in relative bargaining power holding the productivity in the job constant.

The decomposition immediately suggests a potential instrument in the second component of the decomposition. Recalling that we are using cross-city, within industry variation, the  $\Delta \nu_j$  terms are not a source of concern because they are common across all cities and so can't be correlated with the city specific productivity growth in the error term. If we assume that start of period industrial composition (the vector of  $\eta_j$ 's) is uncorrelated with factors affecting general city productivity growth such as changes in roads and other infrastructure then the second component of the decomposition will

be uncorrelated with the error term and, thus, presents itself as a potential instrument. Since it is part of a decomposition of the potentially endogenous right hand side variable, the first stage is likely to be good as well. In Beaudry et al(2012), we also propose a second instrument that corresponds to the first component of the decomposition but where we replace the actual changes in industrial composition for a city with predicted changes based on a combination of the start of period composition of employment and national level growth in employment in each industry. That is, the instrument can be written as,

$$IV1 = \sum_j \eta_{jct} \cdot (g_j - 1) \cdot \nu_{jt} \quad (7)$$

where,  $g_j$  corresponds to growth in employment in industry  $j$  at the national level over the decade. This instrument, too, varies across cities according to the start of period composition of employment (the  $\eta_{jct}$ 's) and so relies on the same assumption that this initial composition is uncorrelated with general city growth. In using this instrument we are essentially asking, do wages in a particular industry grow more in cities where the start of period industrial composition was concentrated in high wage industries that turned out to grow strongly at the national level. That is, did it pay to be in a city where we would predict relative growth in high paid sectors, regardless of the sector in which the worker herself was located.

Both of these instruments are versions of what have come to be called Bartik instruments (Bartik(1991)) and, as such, their condition for validity is exactly the same as for that set of instruments.<sup>8</sup> In our case, the assumption that initial industrial composition is uncorrelated with general growth in a local economy may or may not appear likely to be valid. Fortunately, in our case, we have a strong over-identifying restriction. The two instruments correspond to different ways a worker's outside option could change: a construction worker in Hamilton in recent decades could lose bargaining power because of a reduction in the proportion of jobs in the high paying steel sector or because the wage premium in the steel sector has declined. From the point of view of bargaining with his employer, it doesn't matter which of these happen: what is relevant is the change in the average value of wages the worker could access outside the current job not the route through which that change occurred. That means that theoretically, the two instruments should provide the same estimated effects. Importantly, both instruments rely on the same assumption for validity (the lack of correlation of the  $\eta_{jct}$ 's with general city growth)

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<sup>8</sup>Bartik instruments have been used to examine the impact of regional demand shocks (Blanchard and Katz(1992)) but also in other areas such as the impact of immigration on a local economy (Card(2001)).

but to the extent that correlation is non-zero, the instruments weight it very differently. In IV1 it is weighted by industrial growth at the national level interacted with the levels of the wage premia. In the other instrument (which, to match with Beaudry et al(2012), we will call IV2), it is weighted by changes in national level wage premia. In the US data for the 1980s, 1990s and 2000s used in Beaudry et al(2012) the two instruments turn out to have a correlation of only 0.18 after controlling for year effects. Thus, if the basic identification assumption is violated, we would expect them to generate quite different estimates. Notice that this over-identification condition comes out of the bargaining element of the model: it arises because worker outside options matter in determining the bargained wage and those outside options can change for different reasons.

We also need to be concerned about the correlation of  $\Delta ER_c$  with the error term since we would expect the employment rate to move with general local productivity shocks. To address this, we use the actual Bartik instrument: the predicted change in the local employment rate based on the start of period industrial composition and the growth rates of employment in each industry at the national level. This instrument is yet another weighting of the start of period industrial composition and is also not strongly correlated with the other instruments in the US data. Its validity depends on the same identifying assumption as for  $IV_1$  and  $IV_2$  and so the over-identification test is also relevant for its use.

### 3.1.1 Implementation with Canadian Data

In Beaudry et al(2012), we implement this specification with instrumental variables using US data. Here, I replicate that exercise using data from the Canadian Census.<sup>9</sup> Recall that the key identifying variation is within industries, across cities. In the U.S., with many medium and large sized cities, there is a relatively large amount of that variation. For Canada, there is clearly much less. In fact, the number of CMA's available in the public use version of the Census varies considerably over time from a low of 9 in 1986 to a high of 33 in in 2006. I will present results from the 1981, 1986, 1991, 1996, 2001, and 2006 Censuses, working with the 9 CMAs present in all years. Results when I use all the cities available in each year are similar.<sup>10</sup> I don't use the 2011 NHS because response issues make its comparability with the earlier Censuses problematic. The small number of Canadian cities is partly offset by having Censuses every 5 years instead of every 10 as

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<sup>9</sup>I thank Iain Snoddy for help with this implementation.

<sup>10</sup>In Beaudry et al(2012), we were careful to keep the geographic definition of cities defined in terms of counties constant over time. Since I am using public use Census data for this exercise for Canada, I have not been able to insure the geographic extent of the cities in the sample is constant.

in the US. For industries, I use the 14 industries available in all the Censuses. Dropping industry by city cells with fewer than 20 observations and keeping in mind that the regression is run in differences, the result is 571 industry by city by year observations.

As discussed earlier, in order to highlight the notion of good jobs, I want to work with homogeneous workers. To do this, I first estimate a log wage regression at the national level for each Census separately. Included in the regression as covariates are: a complete set of education dummy variables (corresponding to the categories in the 2006 Census); a complete set of age dummy variables (again, corresponding to categories in the 2006 Census); gender; immigrant status; province; and a complete set of interactions among the education, age, gender, and immigrant status variables. Estimating this separately by Census allows for potential changes in returns to education, etc. over time. In addition to these variables, in one specification I include dummy variables corresponding to every non-empty industry-city cell. The coefficients on those dummies are the average log wages in each cell controlling for the other characteristics. I use those coefficients as the dependent variable in the second stage. In a second specification, I re-estimate the log wage regressions but only include dummy variables for the industries. The result is the set of  $\nu$ 's from the model: that is, industry differentials after controlling for other characteristics. In essence, this implies defining Good Job industries that pay a premium for workers in all observable skill groups. Importantly, a Good Job industry is not necessarily a high education industry. This can be seen in Table 1 which contains the industry premia estimated from this regression for 1980 and 2005, with the base group being agriculture. The largest industrial premium in both years was in the primary sector which fits with the notion that wages are set partly to capture rents. Similarly, the second industry in both years is Utilities and Communications, where regulation likely establishes rents. Neither of these are high education industries. At the low end, the worse paying industries are sales and service. As seen in Green and Sand(forthcoming), those industries have fallen behind the others in terms of wages in recent years.

Table 2 contains the estimation results from our specification estimated by OLS and then with various combinations of the instruments (IV3 in the table refers to the standard Bartik instrument that is introduced to address endogeneity in the  $ER_c$  variable). The first stage for the  $\Delta ER_c$  variable is not strong with the first two instrument sets (with a p-value in the Angrist-Pischke test of .23) but is in the final column specification. The first stages for the  $\Delta R_c$  are strong. The estimated effect for  $\Delta ER_c$  is negative in all cases, which is not the sign predicted from theory, but the estimated coefficients for this variable are also all much smaller than their associated standard errors. In Beaudry et

Table 1: Wage Premia by Industry at the National Level: Canada

Industry	1980	2005
Primary	.51	.67
Utilities	.41	.33
Construction	.32	.19
Public Administration	.31	.31
Finance, Real Estate, Insurance	.30	.27
Transportation	.28	.14
Manufacturing	.26	.20
Education	.21	.025
Health	.19	.083
Business Management and Personal Service	.18	.29
Retail and Wholesale Trade	.11	.010
Other Service	.082	-.093
Accommodation and Food Services	-.13	-.32

al(2012), where we have nearly 34,000 cityxindustryxyear observations, the coefficient on this variable is positive but is also far from statistically significant. The conclusion in both cases is that the effects of labour market tightness on wage outcomes is small. In contrast, the effects of the city Rent variable is nearly always significant at the 5% level. More interestingly, its value varies little across specifications, i.e., with whether we use IV1, IV2, or both. As a result, we cannot reject the over-identifying restriction (the p-value associated with the test statistic is 0.86), indicating that our main identifying assumption is also not rejected and giving us some faith in discussing wage setting within the framework of this model. We found the same result in the US data and, in fact, obtained remarkably similar estimates, with the coefficient on  $\Delta R_c$  with that data being approximately 2.9.

While we derived the wage equation within the context of a particular theory, it is useful to think about our estimates relative to competing theories. The main alternative from our discussion is a neoclassical model where the observable industrial wage variation can be justified in the context of a Roy Model. In those models, the wage equals the value of marginal product. With homogeneous workers, in the derivation just presented, the value of marginal product corresponds to  $p_i + \epsilon_{ic}$ . Returning to our initial wage equation, (4), the wage equals this sum multiplied by a proportionality factor plus  $\gamma_{c2} \sum_j \eta_{jc} w_{jc}$ . Thus, if the neoclassical model underlay this data then the city rent variable should not enter the regression. Of course, it is possible that this variable is capturing otherwise omitted features of the local economy that would affect wages in a neoclassical model.

Table 2: Estimation Results for Wage Equation with Local Average Rents: Canada

	OLS	IV		
		1	2	3
$\Delta R_c$	2.76* (0.72)	2.68 (2.40)	2.34* (0.99)	2.28* (0.98)
$\Delta ER_c$	-0.15 (0.51)	-0.41 (2.48)	-0.46 (2.20)	-0.72 (0.97)
Year x Ind.	Yes	Yes	Yes	Yes
Observations	571	571	571	571
Instrument Set		IV1,IV3	IV2,IV3	IV1,IV2,IV3
Angrist-Pischke p-value:				
$\Delta R_c$		0.00	0.00	0.00
$\Delta ER_c$		0.23	0.24	0.04
Over-id test				0.86

Standard errors, in parentheses, are clustered at the city-year level.

\* indicates statistical significance at the 5% level.

For example, changes in wages in an industry with a high proportion of workers in a city could change demand for other goods in the city through income effects. Further, there could be production linkages across industries. If, for example, there was a reduction in the size of the auto-industry in a city, we would expect a corresponding reduction in demand for the output (and therefore the labour) in other sectors that service the auto industry. Since the auto industry pays relatively high wages, the result would be a decline in our rent measure and a drop in wages in other industries but that drop would reflect simple supply and demand, not bargaining.

In Beaudry et al(2012), we address these concerns, arguing against these mechanisms determining our results in four ways. First, the strong over-identification test results fit naturally with a model incorporating bargaining over rents but are much harder to generate in a standard neoclassical model. Second, income and production linkage effects would cause changes in both employment and wages in each sector in a neoclassical model while we estimate effects of the change in composition while holding changes in employment constant. Third, we find that the estimated effects are very similar when we focus just on tradeable goods industries where local demand spillover is less likely to be important. Fourth, we include measures of indirect demand shifts based on linkages in input-output tables and continue to find the same size effects. We also allow for the possibility that higher wages for some workers drive up housing prices in a city and workers in other industries are able to bargain higher wages to compensate for this

increased cost of living. We view this as a channel through which the general equilibrium effects we have measured occur and when we allow for this with the inclusion of housing price changes in the regression we find that about 75% of our total estimated effect happens through direct bargaining effects and about 25% through an indirect channel through housing prices. We do not argue that these findings can fully prove that our results do not fit with a neoclassical model - with enough unobservables, those models can be adjusted in some way to fit virtually any pattern - but in our view the contortions required to justify the significance of the Rent variable in our wage regressions in the context of a neoclassical model are likely to be much less believable than the simple direct story that the estimated coefficient reflects bargaining forces.

Another potential approach to clarifying the role of the average rent versus productivity effects is to work with specifications that allow for more flexible controls for productivity trends. Tschopp(2015) implements a similar search and bargaining model but includes occupations as well as industries. This allows her to include industry by occupation time effects and industry by city time effects. That is, she is able to control for different productivity trends for each industry in different cities. In our example, this means allowing for construction workers in Edmonton to become more productive than those in Moncton over the period of the oil boom. Even with this level of flexibility, she finds similar sized average rent effects to those presented here working with German data.<sup>11</sup>

The relationship of our results to other models with rents, such as efficiency wage models is somewhat less clear. This can best be seen in the context of union bargaining models. MacDonald and Solow(1981) and Pencavel and MaCurdy(1986) discuss wage and employment setting in two models. In the first, unions and firms bargain over wages but firms then set employment on the labour demand curve. In this case, the wage will be a function of the workers' outside options and so will be a function of the local industrial composition. Thus, this model seemingly fits with our results. But with employment set as in a standard neoclassical model, any resulting wage increases will necessarily imply employment declines. That is, as in the neoclassical model, we shouldn't see wage effects of local rents while holding employment constant. In the second model, with firms bargaining points on the efficient schedule along which firms and workers jointly choose

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<sup>11</sup>In another paper (Tschopp(2014)), she also allows for stronger impacts of wage changes in industryx occupation cells where workers in a given cell are observed to be more likely to move. That is, while the estimation here assumes that changes in construction wages affect the wages in the financial sector, she gets more refined estimates by weighting down such connections. Again, she finds significant spillover effects that fit with bargaining.

employment and wages, there is a possibility of considering an industry in two cities with the same employment rate changes but different composition changes having different wage changes in the cities.

The same arguments apply in the various efficiency wage models. Many of them are written down with employment determination being on the labour demand curve, but they could be written in other ways. The key point is that in all of them, changes in the value of outside options will lead to a different wage in all industries. And, as in the search and bargaining model, whether that outside option changes because high paying industries leave town or because the wage premia in the high paying industries decline is not important. So, our over-identifying test cannot test between the search and bargaining model and other models where outside options affect worker wages. Nor can we test against a model where there are rents from resources and workers capture part of those rents.

What we can say is that this evidence rejects the notion that workers fully pay for higher wages in some way. If they did then the values of all jobs to workers would be driven down to the equivalent of the value of home production and there would be no avenue for changes in local industrial composition to affect wages. Similarly, if there were rents in industries from whatever source but all the bargaining power rested with employers (for example, as we saw in some wage posting models with homogeneous workers) then industry differentials would reflect differences in the value of home production of workers in different industries and could not be the basis for bargaining higher wages in other industries. In addition, if wage differentials across industries were simply compensating differentials then shifts in industrial composition would not affect wages. That is, if wages in another industry are high because workers there have to work with asbestos, you cannot use growth in that industry as a basis for bargaining a higher wage from your firm. Thus, our results point to the existence of Good Jobs: jobs where there are rents and workers capture at least some of those rents.

### **3.1.2 Interpreting the Size of the Spillover Effect**

Interpreting the size of the coefficient on the city rent variable can best be done in the context of a standard shift-share analysis of movements in average wages.<sup>12</sup> To see this, start with the standard decomposition of the change in the average wage in a city into

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<sup>12</sup>The following analysis on decomposition effects was part of an earlier version of Beaudry et al(2012) that was not included in the final published version and was written in conjunction with Paul Beaudry and Benjamin Sand.

between industry and within industry components:<sup>13</sup>

$$\Delta \bar{w}_{ct} = \underbrace{\sum_i w_{ict}(\eta_{ict+1} - \eta_{ict})}_{\text{Between}} + \underbrace{\sum_i (w_{ict+1} - w_{ict})\eta_{ict}}_{\text{Within}}.$$

The first summation on the right hand side is called the Between effect and shows the direct effect of a change in industrial composition. The second term is called the Within effect and refers to changes in wages within industries over time. This decomposition is commonly used in evaluating the impacts of changes in aggregate demand and policies that would be expected to work through altering industrial composition. For example, the impact of trade on wages is often examined by first estimating the effects of changes in import penetration on employment by industry and then using the implied change in the Between effect as the measure of trade induced wage changes.

The use of the Between effect from the decomposition in this way rests on the assumption that the Between and Within Effects are uncorrelated. The estimation results presented in the previous subsection question that conclusion since they imply that changes in the Between component could drive changes in the Within component (changes in wages within all industries). As a simple representation of this, in Figure 1 I plot changes in the Within component of wage changes in each city for each decade (roughly, the 1980s, 1990s and 2000s) in the US data from Beaudry et al(2012) against changes in the Between component. To make the results comparable to our estimates, I replace the Between component with:

$$A_{ct} = \sum_i \nu_{it}(\eta_{ict+1} - \eta_{ict}),$$

which is one of the components of changes in our measure of city rents,  $\Delta R_c$ , that uses national level instead of local level wage premia. The cloud of points in the figure shows a clear positive correlation, with the coefficient on the regression line through the cloud equalling 2.66 (s.e. = 0.23). This is compelling evidence for questioning the key assumption underlying the shift-share analysis that the Between and Within components are uncorrelated. Moreover, the relationship is not driven by outliers. That is, the relationship does not just correspond to, for example, cities like Detroit and Pittsburgh that experienced substantial losses of high-paying industries. It is worth keeping in mind that the wage premium measures used in forming  $A_{ct}$  were constructed controlling for

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<sup>13</sup>Here we are neglecting the second order term  $\sum_i \Delta \eta_{ict} \Delta w_{ict}$ .

observable skills so the shifts toward and away from high-premia industries captured in the movements in  $A_{ct}$  are not related to skill premia.

The plotted pattern in Figure 1 is, in fact, the variation used in our main regression except that in the regression we show that the estimated relationship is robust to controlling for changes in the employment rate. Our main question of interest is then, if the standard decomposition fails in providing an estimate of the effects of changes in industrial composition on wages because of a failure of its key orthogonality assumption, how big are industrial composition effects? In other words, how large is  $\frac{\partial \Delta \bar{w}_{ct}}{\partial A_{ct}} \cdot A_{ct}$ ?

Note, first, that this derivative equals  $(1 + \sum_i \frac{\partial \Delta w_{ict}}{\partial A_{ct}} \eta_{ict}) \cdot A_{ct}$  in the presence of general equilibrium effects. Using our estimated wage equation, we can evaluate  $\frac{\partial \Delta w_{ict}}{\partial A_{ct}}$ . To see how to do this, note, first, that  $A_{ct} = \Delta R_{ct}$ .<sup>14</sup> Then, from our baseline wage equation, we have estimated that if  $A_{ct}$  is driven by changes in aggregate demand patterns then  $\frac{\partial \Delta w_{ict}}{\partial A_{ct}}$  is given by<sup>15</sup>

$$\frac{\partial \Delta w_{ict}}{\partial A_{ct}} = \frac{\gamma_2}{(1 - \gamma_2)} + \gamma_3 \frac{\partial \frac{E_c}{L_c}}{\partial A_{ct}}.$$

In principle, we need to evaluate  $\frac{\partial \frac{E_c}{L_c}}{\partial A_{ct}}$  and incorporate it into our calculation. However, our IV estimates of  $\gamma_3$  are consistently found to be small and insignificant. In other words, we found that wages are very insensitive to changes in aggregate labour market conditions other than those captured by our measure of industrial composition,  $R_{ct}$ . This leads us to infer that using either U.S. or Canadian data  $\frac{\partial \Delta \bar{w}_{ct}}{\partial A_{ct}}$  is estimated to be  $1 + \frac{\gamma_2}{(1 - \gamma_2)}$ , which is on the order of 3.5.

Working from this conclusion, our estimates imply that the total effect on average wages of a shift in composition toward higher paying industries is approximately three and a half times what is reflected in a standard accounting measure. This total effect may initially sound overly large but it is worth recalling that the accounting measure effects tend to be quite small. In an interesting application of this methodology, Fortin and Lemieux (forthcoming) examine the effect of the resource boom of the 2000's on the wages in what they call the Extractive Resource intensive provinces (Alberta, Saskatchewan and

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<sup>14</sup>We can decompose  $\Delta R_{ct}$  as,

$$\Delta R_{ct} = \sum_i \nu_{it} (\eta_{ict+1} - \eta_{ict}) + \sum_i (\nu_{it+1} - \nu_{it}) \eta_{ict+1} = A_{ct} + \sum_i (\nu_{it+1} - \nu_{it}) \eta_{ict+1}.$$

Thus, in the case where the  $\nu_{it}$ s are not varying over time, the change in  $R_{ct}$  is exactly the amount the accounting approach attributes to changes in industrial composition.

<sup>15</sup>Here we are taking national level wage premia as given when varying  $A_{ct}$ .

Newfoundland) relative to the other provinces. They calculate that the average wage in these ER provinces grew approximately 23 percentage points more than the average wage in Ontario between 1999 and 2013. They also show that the ER sector paid a positive 27 log point differential relative to average wages even after controlling for observable worker characteristics (i.e., it is a Good Job sector) and employment in the ER sector in Alberta grew from making up 8.2% of employment in 1999 to 11.9% in 2013. On the face of it, this is a large positive shift in wages and employment. But to find its impact on the average wage, we need to multiply the two proportions together. That is, the effect of the growth in the resource sector on the average wage in Alberta obtained from the standard Between component equals 0.27 times .037, or about 1 percentage point. Thus, one is forced to conclude that general wage increases in the ER provinces relative to Ontario were not a result of the resource boom. But when they estimate our specification allowing for spillover effects on other industries, they find that over half the difference in wage growth for the ER provinces relative to Ontario can be accounted for by the shifts associated with the resource boom. While Fortin and Lemieux(forthcoming) note the need for some caution in relying on the precise magnitude of their estimates due to econometric issues, the result fits with the notion that even workers not in the resource sector can benefit from increased rents obtained by the workers in those sectors.

The patterns uncovered by Fortin and Lemieux are not unique. Any change in industrial composition will tend to induce small changes in the Between component because it involves multiplying together two proportions. This is a direct reflection of an underlying assumption in the standard decomposition that the arrival of a high paying firm will only benefit those workers who are directly employed by that firm, ignoring any general equilibrium induced wage spillovers. Given this quality of the decomposition approach, it is not surprising that it has been common to find that forces like trade - where changes in import penetration are assumed to affect the wage distribution by shifting the industrial composition of employment - have limited impacts on wages. Indeed, it seems possible that the decline in discussion of what was broadly called industrial policy in the economics literature since the 1980s could be attributed to a general consensus that shifting the industrial composition could only have limited effects that itself follows from the (correct) conclusion that standard decompositions of wage changes imply that only small portions of those changes can be attributed to industrial composition changes. Our results suggest there is a need to rethink those conclusions.

### 3.1.3 Summarizing the Empirical Results

It is worth summarizing what we have learned from our empirical investigation. First, Good Jobs exist. The pattern of wage responses to changes in industrial composition and wages in the rest of the economy fit with the existence of rents on jobs and an ability of workers to capture part of those rents. In essence, for the wages of a worker in industry A to be affected by changes in industries B and C while holding employment in A constant, she must not be indifferent to the jobs in those industries. That is she must either see them as Good Jobs relative to her job (i.e., as a job she would prefer if only she could get it) or her job as good relative to them. Second, wages in an industry fit with models with bargaining over rents. This is revealed, in particular, in our over-identification test. Third, standard decomposition analysis of factors that have their effects through changing industrial composition such as trade will understate the full effects of those factors on the wage structure because they do not take account of those bargaining channel effects. Our estimates imply that the full effects are on the order of 3.5 times what is implied by a standard decomposition.

## 4 Good Jobs and Theories of Justice

In the next section, I will consider the implications of the existence of Good Jobs and their form for broad policy considerations. Before embarking on that discussion, in this section I argue that it is useful to couch such discussions in terms of theories of justice. John Rawls, in his classic book *A Theory of Justice* describes justice as the "prime virtue" of institutions and discusses a notion of political economy that involves comparing institutions to principles in theories of justice (Rawls(1999)). His famous veil of ignorance is a device for determining the principles underlying that exercise. In this section, I will discuss the potential existence of Good Jobs in the context of such a Rawlsian Political Economy exercise, asking how labour market institutions that do or do not generate Good Jobs match against some prominent theories of justice.

Many economists have contributed both theoretically and empirically to these types of discussions (e.g., Duclos(2009)) but the notion that we would ask questions related to the justice of institutions is still somewhat out of the norm for most economists - particularly empirical economists. That, I believe, is because of a vague, implicit reliance on the Welfare Theorems. In Chuck Blackorby's 1990 Innis Lecture, he argues that through referring to the Welfare Theorems we see ourselves as the mechanics who make

sure the bus runs well; where the bus is going or how fast is a decision made by the bus driver and riders through other means. But Chuck goes on to argue that the assumptions underlying the Welfare Theorems are unlikely to hold in the real world and that, in turn, implies that efficiency and equity are not so easily separated (Blackorby(1990)). To return to his analogy, the separation of roles works well when the bus is efficiently made and the roads are smooth but it is incumbent on us to warn the driver that while the road to the right may be the fastest, with the way the bus is constructed and the bumpiness of the road, the people at the back of the bus will be banged around.

How luck affects wages and the distribution of jobs is a key example of the intermingling of practical questions about how labour markets operate with questions of justice. As I have discussed, the existence of Good Jobs is associated with luck playing a role in labour market allocations. I also argued that Good Jobs involve rents that are ultimately related to market imperfections. Those imperfections take us out of the world of the Welfare Theorems since they violate the underlying assumptions of those theorems.

Not surprisingly, luck is also a concept that is central to deliberations in many theories of justice. Rawls describes his theory as "justice as fairness", with Wolff(1999) defining fairness as "the demand that no one should be advantaged or disadvantaged by arbitrary factors" such as being born to wealthy parents. Rawls's veil of ignorance is exactly intended to uncover the set of principles underlying a just society by eliminating arbitrary personal advantage from the discussion. In his construct, a set of rational individuals determine the core principles of a society of which they will be members but without knowing either their abilities or their preferences within that society. Rawls argues that these people will put forward two key principles on which the institutions of a just society would be built. The first is that all people have the right to basic liberties commensurate with similar liberties for others. The second is:

"Social and economic inequalities are to satisfy two conditions. First, they must be attached to offices and positions open to all under conditions of fair equality of opportunity; and second, they must be to the greatest benefit of the least advantaged members of society." (Rawls(1993), p.29))

The second of these two conditions is called the Difference Principle: inequalities in what Rawls calls social primary goods are allowable only to the extent they are to the benefit of the least well-off. It is exactly at this point that the existence of Good Jobs become relevant. The opposite of having Good Jobs is that wage variation reflects

compensating differentials related to characteristics of the job and/or differences in the productivity of different workers. If institutions that generate remuneration in proportion to productivity are needed for the efficiency of an economy - increasing the size of the pie - and that efficiency is needed to improve the lot of the worst off then those institutions could fit with the Difference Principle. In contrast, Good Jobs, since they are about dividing up rents, are by definition not a part of making a bigger pie, though they, too, could be rescued through the Difference Principle because of the spillovers to other wages we have identified. Further, wages and positions allocated according to productivity would potentially fit with notions of fairness as long as they are "open to all under conditions of fair equality of opportunity." But Good Jobs are allocated according to luck, and it is precisely this type of luck related advantage that Rawls' citizens behind the veil seek to avoid. Taken together, these points seem to indicate a need to address and possibly eliminate Good Jobs under Rawls' criteria. I will return to this point in the next section.

A main criticism often levelled against Rawls' scheme is that it implies the worker assumes no responsibility for her or his choices. In Kymlicka(1990)'s version of the story there are two equally talented people one of whom chooses to be a gardener and produce food while the other chooses to play tennis. Under Rawls' scheme, society's institutions should be built on the notion that the tennis player should be guaranteed the same level of primary social goods as the gardener, which would, in turn, imply transfers from the gardener to the tennis player. Perhaps the main response to this issue is found in the work of Ronald Dworkin. In a series of influential articles (including Dworkin(1981a, 1981b), Dworkin set out an alternative scheme for thinking about the principles of distributive justice. In his scheme, individuals on an island are given equal numbers of shells to bid on society's resources in order to fulfil their goals. Importantly, the individuals know their preferences and are morally responsible for the choices made based on them. They also know their abilities but, in a twist that appeals to the hearts of economists, they do not know how their abilities will be valued in the equilibrium that will emerge in the real world. That means that the person who chooses to be a tennis player might conceive of worlds in which his playing is highly remunerated but he takes responsibility for his outcomes if those worlds do not emerge. He has no claim in justice for help from society if being a tennis player turns out not to pay well.

A key feature of this theory and related theories developed by others is the separation of luck into brute luck and option luck. Brute luck refers to outcomes over which the individual does not have control and for which she is not morally responsible as a conse-

quence. Option luck relates to outcomes determined by choices made by the individual. According to Dworkin, rational agents on his island will choose to set up an insurance scheme before the actual equilibrium payments are determined in which they can purchase insurance against brute luck but not option luck. The redistributive system can be seen as a real world embodiment of that insurance scheme. Importantly, individuals can sometimes convert brute luck into option luck by buying insurance. Thus, having your house struck by lightning and burning down seems like brute luck, implying that a just society would come to your aid. But if there is fire insurance available and you did not purchase it then the loss of the house is actually a reflection of your choices, that is, it is option luck, the outcomes from which confer no claims in justice.

If there are no such things as Good Jobs and wages equal the value of marginal product then just redistribution under the luck theories will involve unpacking the effects of innate ability (which is an element of brute luck) from those of effort (which relates to option luck). Roemer, for example, puts emphasis on equalizing opportunity (Roemer(1996)). When there are Good Jobs, however, one might reasonably see them as reflecting brute luck and, therefore, requiring redistribution. Pushing deeper, though, this conclusion might be over-turned to the extent that workers get Good Jobs by putting more effort into job search than others. Indeed, if the cost of the search effort exhausts the value of the rents on Good Jobs then, in reality, Good Jobs do not exist. There may be jobs with high wages relative to what is paid on other jobs for similarly talented workers but the marginal worker is indifferent about those jobs because of the associated costs of search.<sup>16</sup> In that case, there is no reason for redistribution. Thus, our conclusion that Good Jobs do exist points to a rationale for redistribution under this theory.

The role of luck in redistributive justice is, to say the least, a contentious point in philosophy and my descriptions only begin to scratch the surface of what is a complex discussion. Nozick(1972), for example, challenges Rawls exactly on the point that simply because a distribution arises through luck does not necessarily imply a reason in justice to redistribute. For Nozick, as long as the Lockean proviso is met (i.e., that obtaining your share of luck does not interfere with my rights to pursue my ends) and transfers of resources are just there is no reason for redistribution.<sup>17</sup> Sen and Nussbaum's theory

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<sup>16</sup>For search to exhaust the benefits of Good Jobs would require some type of directed search. With random search, the average rent on jobs will just balance the costs of search for the marginal worker to the labour force but he will still get a rent from meeting with a high productivity firm.

<sup>17</sup>Varian(1971) argues that while free exchange in markets fit with this notion of just transfers, Nozick's theory is incomplete in that it provides no story for where initial endowments that underlie the fair exchanges come from. In that sense, luck as defined by others is sidestepped as an issue. This point could be extended once one considers multiple equilibria. In Acemoglu(2001), for example, there can

is similar insofar as luck does not play any central role in considerations of distributive justice. For them what matters is whether a person has access to what is required for their share in an equal distribution of capabilities.<sup>18</sup> Since capabilities include core characteristics such as respect, this does not require full material equality nor is there any reason to undo the effects of luck in and of themselves. Instead, as Arneson(2001) argues also for Dworkin and potentially for Rawls, obtaining resources through brute luck does not imply a failure in distributive justice in itself but it does mean that those resources are available for redistribution if needed to obtain a fair final distribution. In Dworkin, that means that it is the outcome of this luck that is the focus of the insurance system and its real world tax and transfer realization.

## 5 Implications

### 5.1 Bad Jobs

Before focusing on issues related to Good Jobs, I want to spend a moment thinking about their opposite: Bad Jobs. I have presented the discussion as if there is a kind of symmetry between Good and Bad Jobs, that is, if we can show the existence and nature of Good Jobs then we must also be showing the existence and nature of Bad Jobs in mirror image. Or, we could describe truly Bad Jobs as at the opposite end of a continuum from Good Jobs. But this does not have to be the case. In Bulow and Summers version of an efficiency wage model or Acemoglu's version of a search and bargaining model, the lower paid jobs are called Secondary Sector or Bad Jobs but it is not entirely clear why that is true. There is nothing in the models to say that the market outcomes in the lower wage sectors have other bad features or even pay wages that would imply that the workers receiving them are poor. Similarly, our empirical work demonstrates that there

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be equilibria with a predominance of Bad Jobs and others with a predominance of Good Jobs. For a given equilibrium, workers enter freely into exchanges and so the outcomes would be considered as just under a straightforward reading of Nozick(1972). The question is whether we should consider a broader notion of freedom that includes choice across equilibria but would involve societal intervention to realize. Following from Varian's point, what is missing is an account of how the forces that imply the realization of one equilibrium versus another are to be seen in terms of justice.

<sup>18</sup>In the theory of distributive justice developed primarily by Amartya Sen and Martha Nussbaum, the key building blocks in considerations of justice are functionings: "the various things a person may value doing or being." (Sen(1999), p. 75). Those functionings, for Sen, include basic ones such as "being adequately nourished and being free from avoidable disease," but also include higher order characteristics "such as being able to take part in the life of the community and having self-respect."(Sen(1999), p. 75). The collection of functionings a person can actually access are called capabilities and it is the equalization of capabilities that is the goal of social justice in this line of thinking.

are rents on jobs and that workers are able to capture part of them. This does not have to imply that the lowest rent jobs are Bad Jobs. The most I think we can say is that it seems conceivable to construct models with Bad Jobs in equilibrium and that, if we came up with a clear definition of them, we might well find evidence of being in such an equilibrium.

On the other hand, from the points of view of common descriptions of Bad Jobs and many theories of justice, we could condemn Bad Jobs as unjust. As I discussed in the introduction, features of Bad Jobs including erratic scheduling of hours, lack of common courtesy from the boss, and lack of opportunity for self realization imply that they are killers of self-respect.<sup>19</sup> Given the primacy of respect in the theories of Rawls, Sen, Nussbaum and Wolff among many others, this would point to a desire to institute policies that eliminate Bad Jobs.

It is important, at this point, to highlight that the evidence from economists described in the previous section has almost entirely to do only with wages. Years ago, while working for the Fraser Institute, Walter Block developed the argument that the government didn't need to intervene in cases of sexual harassment at work because the market would insure that the harassees were already getting paid a compensating differential for what they faced.(Block(2012)) I think what makes even economists shake their heads at this argument is not just the implicit naivete about what markets on their own can and cannot do but the fundamental notion that monetary compensation could truly make up for what harassment does to a person's notion of security and self-respect. And the same can be said of other elements of Bad Jobs. The implication is that our evidence on wages does not necessarily carry over to important elements of what people describe as Good and Bad Jobs. I believe there is the potential for a fruitful interaction between philosophers and economists in thinking about justice in this context and in trying to understand the implications of lack of dignity and respect as embodied in Bad Jobs in both economic theory and empirics. <sup>20</sup>

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<sup>19</sup>Jonathan Wolff, in his discussion of respect and fairness in recent theories of distributive justice argues, from the other side, that certain types of treatment undermine self-respect and make us feel that other do not respect us. Key among these are: not being treated with common courtesy (being kept waiting, or being "ignored, patronized, or shouted at,"(Wolff(1998), p. 108)); being treated with a palpable lack of trust; and being forced to doing things or reveal things about yourself that you would view as shameful.(Wolff(1998))

<sup>20</sup>Craig Riddell pointed out to me that the union literature on voice versus exit does pay attention to features of jobs other than wages and to policies that affect worker abilities to address arbitrary treatment by firms.

## 5.2 Are Good Jobs Just?

So, I will largely ignore Bad Jobs for the remainder of the discussion and focus on Good Jobs as defined in section 3. Perhaps the clearest question we can ask is whether Good Jobs would be part of a just wage structure. Or, put in terms of the Rawlsian Political Economy exercise, how do institutions that imply Good Jobs match theories of justice?

One conclusion from the earlier theoretical discussion was that what I have defined as Good Jobs are ultimately based on market imperfections. One might then recast the question as asking whether a world without this set of imperfections is more just. Such a question seems potentially too fanciful to be useful. Sen(2009) argues for a distinction between what he calls "transcendental institutionalism" theories of justice and a "realization-focused comparison" approach. The former includes theories such as those of Rawls and Dworkin that involve the search for the most just set of institutions. It is not entirely clear how to see comparisons to the real world in relation to this set of theories since to any statement that the world works in a specific way and therefore requires certain actions to attain justice could always be answered that the world would not have that fault when truly just institutions are in place. In contrast, the "realization-focused comparison" approach seeks to try to identify the direction to proceed from the point at which we find ourselves now, taking into account the fact that people will not agree on one set of principles of justice even in seemingly straightforward situations. I will continue the discussion following the latter approach. Imperfections such as frictions in the labour market are features of the real world that we are stuck with. That implies that we should pursue a set of more realistic questions, and I will try to set those out in the ensuing subsections.

### 5.2.1 Would Generating More Good Jobs Be a Step Toward a More Just Wage Structure?

A more reality-based question is whether a more just economy than what we have now would involve more Good Jobs. At first glance, the answer to this question seems obvious: aren't Good Jobs good, after all? But looking back at the accounts of luck in theories of justice, the answer becomes less clear. Good Jobs are reflections of luck in the labour market and, as such, in both Rawls and the luck theorists are prime candidates for the attention of redistributive schemes. To the extent that Good Jobs are distributed randomly - perhaps through the sheer blind luck of an unemployed worker running into a Good Job vacancy - their current distribution might be seen as fair. However, it

seems clear that under the principles derived by Rawls' highly risk averse citizens behind the veil, even that lottery would not be seen as part of a just society. Dworkin would reach a similar conclusion, though toned down by the fact that the response would be operationalized through an insurance scheme in which participants would likely not fully insure against the risk of getting a Bad Job to the point of equality. The key point here is that differences in wages over a lifetime from getting a Good Job versus even an average job are substantial. As discussed earlier, it is not that most theories of justice see advantages arising from luck as inherently unethical but those advantages are based on arbitrary factors and, as such, are eligible as a source of revenue to help those who have had arbitrary bad luck of various kinds. The implication is that there would be no call to increase the number of Good Jobs if their proceeds are just going to be redistributed in any case.

Our results showing significant spillovers from Good Jobs to wages in other jobs, however, can alter this conclusion. One of the interesting conclusions from the empirical results discussed here, including the strength of the over-identification test, is that the benefits of Good Jobs get distributed to workers in other jobs by altering bargaining outcomes. Indeed, those benefits appear to be distributed quite widely since workers in all other sectors can use the example of one Good Job sector in their bargaining. That conclusion is directly reflected in the fact that we estimate that the impact of a change in the composition of jobs in a local economy has an effect on the average wage that is three and a half times what one would conclude from a simple decomposition. Under Rawls, such spillovers point to an application of the Difference Principle, that is, the wage advantages in Good Jobs are potentially defensible to the extent that they raise the position of the least well-off in society. Similarly for Dworkin, the wage spillovers could be seen as a manifestation of the attempt to insure against low wage outcomes when the real world equilibrium is revealed.

Following from these points, we can consider two redistributive schemes. In the first, the rents associated with Good Jobs are taxed away and distributed to people with Bad Jobs. Doing this would, of course, eliminate Good Jobs in the sense that I have defined them and, along with them, eliminate the bargaining advantages for workers in other jobs. In the second scheme, the rents are not taxed away and redistribution occurs through the mechanism of greater bargaining power for workers. Here, increasing redistribution would occur either through increasing the proportion of Good Jobs or through mechanisms that increase workers' abilities to take advantage of outside options in bargaining. At this point, the importance of self-respect and dignity become relevant.

It seems clear that a redistributive mechanism that is associated with dignity-enhancing work is better for self-respect than one based on simple transfers. Indeed, Anderson(1999) and Wolff(1998) argue that a key problem with the redistributive schemes that emerge from the luck theories of justice is that they involve demeaning public admissions of being of low ability in order to receive transfers. To the extent that Good Jobs in terms of wages tend also to be Good Jobs in terms of features of jobs such being treated with courtesy, opportunities for advancement, etc. the second approach also enhances self-respect in this way.<sup>21</sup>

Whether enhancing Good Jobs is a preferred approach to improving justice depends on the answers to several other questions. First, what is the source of the rents that define the Good Jobs? If the rents arise from regulations or other barriers restricting output markets then increasing them would imply a shrinking of the pie. I don't know of direct answers to the question of whether the effect of that shrinking on the least well off (under Rawls) or the fair distribution of capabilities (under Sen and Nussbaum) would be more than offset by the redistributive effect of workers bargaining higher wages. My guess is that in certain circumstances such as the creation of artificial monopolies, it would not be. But there may be some restrictions - for example, to free trade - where the question might be more open.

The other main source of rents we have discussed arise from labour market frictions. The size of those rents can then vary with the productivity levels of different firms. Syverson(2011) surveys and discusses a growing literature on firm productivity differentials, stating that the available empirical evidence shows that even among firms in the same 4 digit manufacturing sector in the U.S., the 90th percentile firm has twice the productivity of the 10th percentile firm. Further, as described earlier, Acemoglu(2001) argues in the context of his modified DMP model that there is reason to think that an unfettered

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<sup>21</sup>There is another, somewhat more subtle way in which the allocation of wages and employment in an economy affects the justice of a society. Rawls argues that institutions in a just society will be self-perpetuating in the sense that they help citizens see and commit to the core principles of justice as fairness. To the extent they do that, the society will be able to maintain and even deepen the justice of its institutions. In a somewhat similar vein, Adam Smith in *The Theory of Moral Sentiments* argues people are ultimately social in that they have an innate concern for others and that a society built on that core principle of fellow-feeling will flourish. He goes on to state that societies can be based on pure self-interest and function, much as markets do, but those societies are "less happy and agreeable." (Smith[1790] , p. 109) Good Jobs can be a source of self-respect, dignity and self-realization as well as monetary reward. As such, increasing their proportion could enhance perceptions that we live in a fundamentally just society and strengthen the fellow-feeling that underlies more generous sentiments in supporting specific institutions in society. However, the source of the rents underlying Good Jobs will matter here as well. If those rents come from artificial restrictions then their allocation might, instead, challenge people's notions of the fairness of their society.

economy will produce an inefficiently small number of Good Jobs because firms do not take account of the advantage of these jobs for workers. Together, these imply that it would be advantageous to pursue policies that push toward an equilibrium with more Good Job firms.

The second question is who gets the Good Jobs. While the higher wages on Good Jobs spill over to other workers through bargaining, one would still expect that the greatest advantage from the existence of Good Jobs goes to those who hold them. If Good Jobs are distributed through discriminatory means then enhancing the number of them would not improve justice. There is some interesting theoretical and empirical work on this point. Card et al(2015) investigate male-female wage differentials in the context of matched worker-firm data from Portugal. They find that women are less likely to be employed at firms that pay higher premiums to either gender and that women capture less of the firm specific surplus in bargaining. Bidner and Sand(2012) provide a potential route through which the latter effect arises, showing that women in the US bargain lower wages than men because the industries in which they typically work (and therefore their outside options in the context of the model set out in the previous section) are lower rent sectors. Increasing the proportion of Good Jobs without addressing these issues of access would challenge any claim to be improving justice.

Holding aside direct discrimination, the distribution of the direct and spillover benefits of Good Jobs is important for evaluating their contribution to justice in the wage structure. Evaluations of the direct impact of unions on inequality indicate mixed results because the lowest paid workers do not tend to be unionized and so increasing the size of the union sector along the lines of historical patterns does not help them directly (Card, Lemieux and Riddell(2004)). However, spillover effects from bargaining might imply more positive results for low wage workers. On the other side, Card et al(2013) argue that German data shows evidence that the best workers match with the highest paying firms. In that case, more Good Jobs could just imply that the rich get richer. The question of how direct and bargaining effects of Good Jobs are distributed across the wage distribution is one on which more work needs to be done.

## 6 Policy Implications

The discussion of Good Jobs and theories of justice indicates, I think, that one cannot argue for or against policies related to Good Jobs without being specific about the policies themselves and the labour market context in which they will be implemented. I see

the related policies as divided into those aimed at improving the bargaining power of workers and those aimed at altering the sectoral composition of the economy, shifting it toward Good Job sectors. In the former group, I would put minimum wages (which are a direct intervention into bargaining outcomes) and unionisation (where pro-union laws constitute a more indirect intervention). These policies, of course, also have general equilibrium effects that can alter the sectoral composition in the economy and I will discuss minimum wages in that context below. I provide a more extensive discussion of the effects of minimum wages in the context of theories of justice in Green(2014).

Policies related to unions are the probably the first to come to mind when considering whether and how to increase the ability of workers to capture a larger portion of the surplus. As I discussed earlier, I think a key input needed in this discussion is a measure of the extent of the spillover of union wages to other jobs and, more specifically, of where in the wage distribution any spillover benefit resides. While there has certainly been work in the past on union spillovers, there is a need for more work using more modern identification strategies. In addition, a bargaining framework opens up questions about the role of Social Assistance and Unemployment Insurance in affecting wages through increasing the value of non-work. To the extent these policies allow workers to bargain better wages, they could both serve to trim lower productivity firms from the distribution and increase worker wages. Of course, the question of the trade-off in terms of employment levels is crucial. The balance among these forces I see as an issue of ongoing interest rather than one where I see convincing evidence on one side or the other.

In terms of altering the sectoral composition of Canadian firms, one key channel is trade policy. Here, the theoretical implications are not entirely clear. On one side is the traditional view that increased exposure to import competition increases competitive pressures that destroy rents in previously protected sectors. This channel leads to decrease in the proportion of Good Jobs in the economy. On the other side are arguments most strongly associated with Melitz that increased import competition and export trade opportunities tend to result in the elimination of the weakest firms in newly exposed industries. That would have the effect of reshaping the firm productivity distribution toward one with more Good Jobs. The net impact is an empirical issue.

The literature on the impact of freer trade on wages is diverse but has tended to reach the common conclusion that the overall impact is not large. Gaston and Trefler(1997) and Beaulieu(2000) both find that the impact of the Canada-US Free Trade Agreement on wages in Canada was negligible. Townsend(1997) reassesses this evidence allowing for

changes in the composition of workers and changing returns to characteristics such as education. When he does so he finds large negative effects on wages from tariff reductions for both union and nonunion workers in the industries where tariffs were dropped the most. But because these industries made up a small proportion of total employment, the impact on the overall average wage was small. This fits with my argument that the importance of changes in industrial composition (and of factors that work through that composition such as trade) has been dismissed largely based on this type of decomposition exercise. The spillover results I discussed earlier indicate that trade effects could be substantially larger than previously recognized. To the extent this is true, it does not necessarily imply that free trade is a bad policy but it does indicate that these types of labour market effects should be weighed more heavily than they seem to have been in past calculations by economists.

Another possibility for reshaping the distribution of job types in an economy is through the minimum wage. In Acemoglu(2001)'s analysis, high and low paying firms can co-exist because of market frictions and because they face different types of costs (wage costs versus turnover related costs). A minimum wage acts to price the low wage model out of the market by eliminating its main advantage. A piece of evidence that may fit with that conclusion is that layoff rates decline when minimum wages increase (Brochu and Green(2012)). Such a policy has the benefit of not requiring information revelation from anyone and not requiring the government to try to assess which firms are Bad Job firms.

Finally, as exemplified by the pursuit of the film industry by British Columbia, governments may seek to affect the sectoral composition of the economy by subsidizing Good Job firms or sectors. While these types of policies have often been disparaged by economists, some recent evidence suggests they may warrant a closer look. Greenstone and Moretti(2004) examine sets of US cities on the shortlist of competitions for large factories, comparing the cities that won the competitions and got the plants with the ones that were runners-up. After showing that the winners and runners-up in the competition looked very similar in the period before the awarding of the plants, they demonstrate that the winning cities had increased relative labour earnings and increased relative land prices compared to the runners-up. They discuss these earnings effects in terms of direct and indirect demand effects but our estimates suggest that they could, to some extent, reflect bargaining spillover effects. In either case, these results reinforce our conclusion that industrial policy can have an effect on the wage distribution.

## 7 Conclusion

In this paper, I have examined the existence and importance of Good Jobs. I started by arguing that one can define Good Jobs as ones that involve a surplus captured partly by workers. Put another way, the acquisition of these jobs involves luck of some type since the very fact that they involve a rent means their high wages are not being allocated based on productive or job characteristics by definition. Both the existence of rents and the association with luck play an important role in the remaining discussion.

In economics, Good Jobs have typically been defined, empirically, as jobs that pay more than one would predict based on observed worker and firm characteristics. This definition was at the heart of empirical approaches to identifying good job industries in the efficiency wage debates in the 1980s and 1990s and have re-emerged in more recent discussions of the existence of good job firms. In the more sophisticated approaches, worker and firm characteristics are controlled for using worker and firm fixed effects as well as observable time varying worker and firm characteristics. As witnessed in the debates over efficiency wages, though, one can always argue that any remaining firm fixed effects after controlling for worker fixed effects and observable characteristics are really just compensating differentials or returns on investments in unobservable worker skills. Thus, while the evidence in these literatures seems strongly suggestive of the existence of Good Jobs, it cannot be conclusive. Yet, we would like be able to say definitively whether Good Jobs exist in order to decide on the value of potential policy responses.

It is at this point that the definition of Good Jobs becomes important. Paul Beaudry, Ben Sand and I have shown that in models with surpluses to job matches and multiple sectors, wage bargaining in one sector will depend on the composition of employment in the rest of the economy. In particular, if a high paying industry (say, the steel industry) is replaced with a lower paying industry (say, call centres) then workers in the rest of the economy cannot bargain as high wages because they can no longer threaten to quit and go get a better paying job in a steel mill. Alternatively, if steel mills only pay higher wages as compensation for more dangerous work (i.e., if steel mill jobs are not actually Good Jobs by my definition) the other workers cannot use the high steel wages in their bargaining since their employers will know that those higher wages do not bring higher utility to the worker. Thus, a test of whether wages within one sector vary across cities according to the composition of the industrial structure in the rest of the city is a test of whether Good Jobs exist. Using Canadian data, I echo the US results in Beaudry et al(2012) showing that this evidence does indicate the existence of Good Jobs.

I argue that economists are often sceptical about the existence of Good Jobs, in part, because standard decompositions show that the effects of industrial shifts on average wages in an economy are small. I also argue that this is almost a necessary conclusion from the standard decomposition methods, involving as they do the multiplication of two proportions. But once one takes account of bargaining spillover effects, the implied impact of a shift in the industrial composition of an economy on the average wage is approximately 3.5 times what is indicated from a standard decomposition. Thus, Good Jobs not only exist but their effects on the overall wage structure are substantial.

The implications of the conclusion that Good Jobs exist and have a potentially significant impact on the wage structure are, I think, best discussed in the context of the current policy paradigm in Canada and other developed countries. In that paradigm, any job is a good job. The re-design of social assistance and, to some extent, employment insurance and the introduction of the WITB policy in the last few decades point to a strong emphasis on having a job as being the primary policy focus. I see this policy as fundamentally rooted in the neoclassical view of the labour market. The market is efficient (or at least relatively efficient) in matching worker abilities to job requirements and interfering to try to steer it will only lead to mismatch and reduced employment. To the extent that the level of wages and the extent of wage inequality are issues of concern, those can be addressed in two main ways. The first is through human capital investment, bringing all workers to a higher skill level and, hence, competing down skill differentials. The second is through wage subsidies to low skilled workers.

I see two reasons to question this paradigm. The first is an argument that Kelly Foley and I make in a chapter in a soon to be released IRPP/CLSRN volume on inequality in Canada that human capital policy, at least as we currently do it, is far from a silver bullet for inequality and may even exacerbate inequality rather than reduce it (Foley and Green(forthcoming)). The second is found in the results presented here. In the estimates for both the US and Canada, the impact of changes in the employment rate on wages is near zero while the impact of the composition of employment is substantial. In other words, it is not true that any job added is a good job, at least in terms of wages. This suggests that we should carefully consider policies that affect the sectoral composition of the economy as alternatives to human capital, social insurance, and tax and transfer policies for affecting the wage and income distribution. One advantage of policies that work on the wage distribution rather than redistributing earnings is that income improvements obtained through earnings are likely both more strongly associated with self respect and politically harder to take away.

I examine the importance of these findings and usefulness of various policies within the context of some salient theories of justice, arguing for the relevance of a Rawlsian Political Economy exercise. In such an exercise, the institutions in a society or economy are judged in light of the principles in theories of justice. I argue that empirical economists have an important role to play in helping to think about whether changes in institutions would improve the justice of a society. The types of institutions that result in the creation of Good Jobs is a case in point. The fact that the allocation of Good Jobs is, by definition, determined by luck, generates a direct link to theories of justice. Examining those links leads to the conclusion that we need more empirical investigation of elements of Good Jobs in order to be sure whether we want to pursue policies that would increase their prevalence. Most importantly, there seems to me to be much relevant work to be done on how Good Jobs are distributed.

Finally, the discussion here has been almost entirely in terms of wages. I have focused on wages partly because it permits a level of precision and a link to earlier literatures that is less possible when discussing other job characteristics. It is also clearly one of the most important characteristics of a job. But other characteristics that come to mind when we discuss Good Jobs such as feeling respected are certainly also very important. Indeed, a variety of theories of justice indicate that characteristics such as respect are, if anything, more important than wages when considering how to move toward a more just economy. But what we know about those characteristics is limited, especially since it is not at all clear that we can think in terms of simply monetizing their value. This is an area where a Rawlsian Political Economy exercise indicates that there is much work yet to be done.

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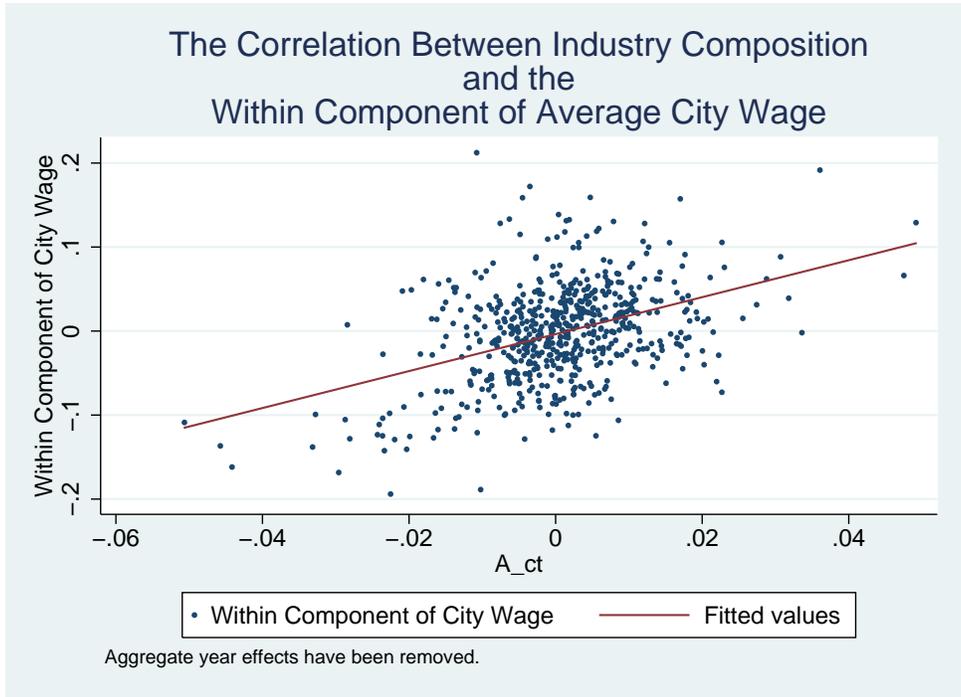


Figure 1: Within component of average city wages and  $A_{ct}$ . Aggregate year effects have been removed.