Place Based Policies and Unemployment

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1 Introduction

Unemployment rates vary enormously across cities and regions. In the US, the variation in unemployment rates across labor markets at a moment in time rivals that of variation over the business cycle. Column 1 in Table 1 reports unemployment rates in US metropolitan areas with the highest and lowest unemployment rates in 2008 according to the American Community Survey. In that year, the unemployment rate in Flint—the city at the top of the list—was almost 15 percent, while the unemployment rate in Iowa City—located less than 500 miles from Flint—was only 2.6 percent. The difference between these two cities– 12 percentage points– is more than double the difference in national unemployment rates observed over the most recent business cycle and even larger compared to the typical cycle.[1]

Of course, unemployment rates are known to vary significantly based on worker skills and demographics, and metropolitan areas can be quite different in terms of the education and demographics of their labor force. But spatial differences in unemployment rates are not simply an artifact of differences in the average characteristics of residents. Estimates of city-specific unemployment rates that condition on individual characteristics also exhibit a remarkable degree of variability. Column 2 in Table 1 shows metropolitan area-specific conditional unemployment rates. They are obtained from an individual level linear probability regression of an indicator for unemployment on metropolitan area indicators and indicators for education, age, gender and race. A comparison of column 1 and 2 indicates that controlling for individual characteristics reduces spatial variation in unemployment rates only marginally. For example, it reduces the gap in the probability of unemployment between Flint and Iowa City from 12.0 to 10.8 percentage points.

Perhaps even more surprising is the fact that these staggering geographical differences are not transitory, but last decades. Figure 1 shows unemployment rates in 1990 and 2008 across 239 metropolitan areas. The figure shows a remarkable degree of persistence, with a regression coefficient of 0.509 (.045). In this respect, the US is not unique. European labor markets also exhibit marked and long lasting differences in regional unemployment rates (Overman and Puga, 2002; Elhorst, 2003). If anything, differences in Europe can be even more long lasting. For example, for the past three decades, the unemployment rate in Southern Italy has been three to four times higher than the unemployment rate in Northern Italy. In 2008, the unemployment rate in Sicily was above 16 percent, while the rate in Veneto (in the Italian North-East) was only 4 percent. Similar regional differences, albeit somewhat smaller, are observed in Spain, France and Germany.

[1] The national rate at the peak of the Great Recession was only 4.7 points higher than the rate in 2006, at the bottom of the cycle.

Given the persistence of these vast cross-sectional differences in unemployment rates, it is not surprising that an increasing number of countries have adopted place based policies transferring resources towards particular geographical areas. Such policies are typically targeted towards areas with weak demand for labor and high unemployment rates, often with the explicit goal of reducing unemployment. For example, the European Union Regional Development Fund explicitly targets regions with high unemployment and low (nominal) income for generous business subsidies and public investment. Since the 1970's, the main business support scheme in the UK —the Regional Selective Assistance—provides discretionary grants to firms in disadvantaged regions, defined as regions with high unemployment and low levels of per capita GDP (Crisculo et al. 2012). Italy has long provided regional transfers that single out high unemployment regions, especially in the South, for special infrastructural investment and, more recently, for hiring incentives and other labor market subsidies (See for example Deidda et al, 2012). Sweden, France and Germany have similar programs (Marx, 2005). European Union legislation generally prohibits state aid, but makes explicit exceptions for place based policies that target "deprived" regions as defined by low per capita GDP and high unemployment. In the US, the federal urban Empowerment Zone (EZ) program was explicitly designed to benefit neighborhoods with high unemployment rates (Busso, Gregory, and Kline, 2012).

Economists have long pointed out two important limitations with such policies. First, standard spatial equilibrium models (e.g. Roback, 1982) suggest that it may be difficult for place-based policies to improve the utility levels of area residents, as increases in labor demand in a region may be offset by increases in local costs of living. Second, standard equilibrium models suggest that place based policies may be inefficient. Under full information, perfect competition with static market clearing, the absence of agglomeration and crowding effects, and the absence of prior distortions due to taxes, place based policies may yield large deadweight losses by creating incentives to invest, work, and live in less productive or hospitable areas.[2]

Recently, a variety of authors have sought to relax some of these assumptions. For example, Glaeser and Gottleib (2008), Kline (2010), and Kline and Moretti (2012) study the implications of agglomeration externalities for the efficiency of place based policies from the point of view of local and national governments. In a different vein, Albouy (2009) indicates that the federal tax code already distorts locational incentives, which may provide a rationale for offsetting policies.

[2]Indeed, in standard models, such as that of Busso, Gregory, and Kline (2012), successful job creation resulting from targeted incentives is actually a sign of inefficiency. The ideal place based subsidy would simply raise wages (or change other prices) in a way that raises the real income of the targeted group without changing behavior.

Thus far, however, not much work has been devoted to studying the implications of labor market frictions for the efficiency of place based policies. Given the large geographical differences in the prevalence of unemployment observed in the real world, understanding spatial equilibrium when the labor market does not clear would appear to be of primary importance.[3] The absence of a theoretical framework to understand efficiency of place based policies in the presence of unemployment is particularly notable in light of the fact that most such programs usually state job creation as a primary goal, often with an explicit emphasis on reducing local unemployment.

In this paper, we develop a stylized model of frictional local labor markets with the goal of studying the efficiency of unemployment differences across areas and the potential for place based policies to correct local market failures. Our model builds on the heavily studied Diamond (1982) - Mortensen (1982) - Pissarides (1985) framework, adapted to a local labor market setting with a competitive housing market. The result is a simple search analogue of the classic Roback (1982) model that provides a tractable environment for studying the effects of local job creation efforts.

In the model, workers are perfectly mobile and the productivity of a worker-firm match may vary across metropolitan areas. In equilibrium, higher local productivity results in higher nominal wages, higher housing costs, and lower unemployment rates. Although workers can move freely to arbitrage away differences in expected utility across metropolitan areas, in equilibrium spatial differences in unemployment rates are not driven to zero. In addition to search frictions, we allow for the existence of hiring costs.[4] We show that if hiring costs are excessive, firms may post too few vacancies. This problem may be offset via hiring subsidies of the sort found in many place based policies. The optimal hiring subsidy is city specific in the sense that it depends upon the local productivity level.

Thus, in our simple setting, excessive hiring costs provide a theoretical rationale for place

[3] Beaudry, Green, and Sand (2012) develop and estimate a multi-sector model of frictional local labor markets where industrial policies can have complex equilibrium effects on wages and population. However, they do not study the welfare properties of their model. A recent paper by Lutgena and Van der Linden (2012) makes progress in developing a tractable search-matching equilibrium in which searching for a job in another region is possible without migrating. Wrede (2012) uses a search-matching framework to understand the equilibrium relationship between local amenities, wages, rents and unemployment. See also earlier work by Francis (2009), Molho (2001), and Epifani and Gancia (2005). Boadway et al. (2004) study policies that should be implemented to restore efficiency when there is an inefficient distribution of firms.

[4] Unlike the costs of maintaining an unfilled vacancy, hiring costs are not sunk at the time a match is formed, and can therefore influence the wage bargain. There are several other possible sources of inefficiency in frictional labor markets, many of which can yield a role for policy. Gibbons and Katz (1991), for example, propose a simple model of equilibrium unemployment that arises due to adverse selection in the labor market. Acemoglu (2001) develops a two-sector search model with holdup where too few "good" capital intensive jobs are provided in equilibrium, while Acemoglu and Shimer (1999) discuss implications of holdup for efficiency of the mix of jobs.

based hiring subsidies even when workers are perfectly mobile. These subsidies ought to be targeted to less productive areas with lower wages. Relative to a neoclassical environment, the underlying motivation for such subsidies is that workers are not perfectly mobile between unemployment and employment. Search frictions yield rents, which, if split incorrectly, yield inefficient job creation behavior.

We stress that our discussion is meant to stimulate further work on efficiency considerations in the local labor market literature rather than to assess the desirability of any particular policy. We note, for example, that local hiring subsidies are likely to face significant implementation problems as authorities cannot easily infer which matches are new.

2 Model Setup

Consider a small representative city to which workers may freely migrate and search for a job. Jobs are filled probabilistically via a constant returns to scale matching function $M(U,V)$ which takes the number of unemployed workers U and job vacancies V as arguments. Letting $\theta \equiv \frac{V}{U}$ denote market tightness, our constant returns to scale assumption implies we can write the job filling rate as $q(\theta) \equiv \frac{M(U,V)}{V} = M(\theta, 1)$ which we assume obeys $q'(\theta) < 0$, $\lim_{\theta \to 0} q(\theta) = \infty$, and $\lim_{\theta \to \infty} q(\theta) = 0$. Likewise, the job finding rate is $\theta q(\theta) = \frac{M(U,V)}{U}$ which obeys $\lim_{\theta \to 0} \theta q(\theta) = 0$, and $\lim_{\theta \to \infty} \theta q(\theta) = \infty$.

Whether searching or employed, workers inelastically demand a unit of housing which they rent at rate c. Housing is supplied competitively on a spot market according to marginal cost so that:

$$c = g'(N) \tag{1}$$

where the function $g(.)$ represents the total cost of producing housing for the local workforce of size N and is assumed to be twice differentiable and convex.

The steady state value of searching for a job is given by:

$$rJ^U = b + A - c + \theta q(\theta)\left(J^E - J^U\right) \tag{2}$$

where r is the interest rate. The flow utility of unemployment b captures the generosity of the local safety net and the value of leisure. The term A gives the consumption value of the local mix of amenities in the city. The term J^E gives the (steady state) value of employment which obeys the recursion:

$$rJ^E = w + A - c + s\left(J^U - J^E\right) \tag{3}$$

with w representing the wage and s an exogenous separation probability.

We depart from the standard general equilibrium assumption of a fixed workforce by assuming that workers may freely exit the city and obtain flow utility z. Thus we have the restriction that in an interior equilibrium:

$$rJ^U = z. \tag{4}$$

This condition is analogous to the standard free-mobility assumption of Roback (1982) who requires that agents everywhere have equal utility. Here they need only have equal values of *search* across communities. The value of employment may vary across communities if it is offset by differences in the local cost of living or the probability of finding a job. Condition (4) in conjunction with the housing supply function (1) will pin down a unique steady state city size N.

Firms may post vacancies which entail flow cost k. Following Pissarides (1999, 2007) we assume the firm must pay a fixed hiring cost H before hiring a worker with whom it is matched.[5] Note that k and H are distinguished by the fact that the vacancy costs are already sunk by the time the firm is matched with the worker, while the hiring costs are not. The value J^V of posting an unfilled vacancy is given by:

$$rJ^V = -k + q(\theta)\left(J^F - J^V - H\right) \tag{5}$$

The value J^F of a filled vacancy obeys:

$$rJ^F = p - w + s\left(J^V - J^F\right) \tag{6}$$

where p is the productivity of the match which we assume is city specific and common to all matches in the city. This parameter is important because it governs the strength of the local labor market. We are interested in understanding how the optimal policy depends on p.

Free entry of firms drives the value of an unfilled vacancy to zero:

$$rJ^V = 0. \tag{7}$$

In a steady state, there will be no migration and the local unemployment rate $u \equiv \frac{U}{N}$ will

[5] See Hamermesh (1989), Caballero, Engel, and Haltiwanger (1997), and Bloom (2009) for evidence on hiring costs.

be determined by the usual function of inflow and outflow rates:

$$u = \frac{s}{s + \theta q(\theta)}. \tag{8}$$

Finally, we assume wages are set via Nash bargaining over the match surplus, so that:

$$(1-\beta)\left(J^E - J^U\right) = \beta\left(J^F - J^V - H\right) \tag{9}$$

where the parameter β gives the worker's share of the match surplus. Note that the surplus being bargained over is net of the hiring cost. A model with holdup would bargain over the surplus ignoring some portion of the hiring cost.[6]

3 Equilibrium

We show in the appendix that the eight equations of our model can be reduced to the following three relationships which characterize the behavior of the endogenous variables θ, c, and w:

$$\frac{r+s}{q(\theta)} = \frac{1-\beta}{k}\left(p - b - (r+s)H\right) - \beta\theta \tag{10}$$

$$c = p + A - z - (r+s)H - \frac{k}{1-\beta}\frac{r+s}{q(\theta)} \tag{11}$$

$$w = \beta\left(p - (r+s)H\right) + (1-\beta)(c + z - A) \tag{12}$$

Condition (10) is standard and can be graphed as the intersection of a modified job creation curve and a Beveridge curve (Pissarides, 1999). Not surprisingly, equilibrium market tightness is an increasing function of local productivity p and a decreasing function of hiring costs H. It is also straightforward to verify that equilibrium market tightness is a decreasing function of worker's bargaining power β, and the costs k of posting a vacancy. An interesting feature of this equation is that it does not depend on the local amenity level A or the outside option z. This is an artifact of our somewhat artificial assumption that firms do not use land to produce goods, which conveniently blocks one channel of feedback from the housing market to the labor market.

[6]Note that this equation pins down the worker's *entry* wage which is key to the job creation decisions of firms. As Pissarides (1999) notes, workers may try to force a renegotiation of the wage after the firm has already paid the hiring cost. This could lead to a different "inside" wage. We ignore this possibility in what follows. Evidence on the importance of such holdup problems is mixed (see Card, Devicienti, and Maida, 2010).

The local cost of living c is an increasing function of market tightness and match productivity p. It varies one for one with the amenity level A and the outside option z (which can be thought of as the amenity value of the outside world) in order to keep workers indifferent. Finally, the wage is a bargaining power weighted average of output net of hiring costs and the cash flow required for workers to obtain utility level z which is z plus the local cost of living c. Because firms do not use land, wages are invariant to the local amenity level A. Relaxing this restriction, would make wages a decreasing function of the amenity level as in Roback (1982). The remaining key endogenous variables: population (N) and equilibrium unemployment (u) can be inferred directly from (1) and (8).

4 Efficiency

The social planner seeks to maximize the total surplus in the economy relative to the outside option which is given by:

$$S = \left[(p - sH)(1-u) + (b - k\theta) u + A - z \right] N - g(N).$$

Total surplus S consists of the output of productive matches net of the steady state costs of hiring replacements plus the leisure associated with unemployment minus the flow cost of maintaining unfilled vacancies. This must then be netted out relative to the outside option which offers workers utility level z. The planner also deducts from the surplus the real costs of housing the local workforce.

Because we are not concerned with transitional dynamics, we now limit our analysis to the case where agents have discount rates of zero which allows us to study steady states rather than convergent paths between steady states. The static planner's problem is to simply:

$$\max_{\theta, N} S \text{ s.t. } u = \frac{s}{s + \theta q(\theta)}.$$

This problem can be thought of as choosing the equilibrium the agent faces before entering the economy. The first order conditions of this problem are:

$$g'(N) = (p - sH)(1-u) + (b - k\theta) u + A - z \tag{13}$$

$$(p - b - sH) \frac{\partial u}{\partial \theta} + ku + k\theta \frac{\partial u}{\partial \theta} = 0 \tag{14}$$

where $\alpha \equiv -\frac{q'(\theta)}{\theta}$ is the (negative) elasticity of the matching function. The first condition determines optimal city size and, given our competitive housing market assumption, can be

restated as:

$$c = (p - sH)(1-u) + (b - k\theta)u + A - z.$$

For this to coincide with (11) when agents have discount rates of zero, we need the following to hold:

$$(p - sH)(1-u) + (b - k\theta)u + A - z = p + A - z - sH - \frac{k}{1-\beta}\frac{s}{q(\theta)}.$$

This can be restated as:

$$\frac{s}{q(\theta)} = \frac{1-\beta}{k}(p - b - sH) - \beta\theta,$$

which coincides with (10) when $r = 0$. Thus, city size is always efficient. This is unsurprising since workers are free to move and we have assumed a perfectly competitive housing market.

The planner's second condition, given in (14), governs efficiency of the job creation process which determines the local unemployment rate. Note that:

$$\frac{\partial u}{\partial \theta} = -\frac{1-\alpha}{s} q(\theta) u^2$$

where $\alpha \equiv -\frac{q'(\theta)}{q(\theta)}$ is the (negative) elasticity of the job filling rate. With this convention, (14) can be rewritten:

$$\frac{s}{q(\theta)} = (p - b)\frac{1-\alpha}{k} - \alpha\theta$$

For this to coincide with (10), we need

$$\frac{1-\beta}{k}(p - b - sH) - \beta\theta = (p - b)\frac{1-\alpha}{k} - \alpha\theta. \tag{15}$$

Note that in the absence of hiring costs ($H = 0$) this condition is satisfied whenever $\alpha = \beta$, which is often referred to as the Hosios (1990) condition. There, in general, no reason to expect this condition to be satisfied. Rearranging (15), we have that the optimal hiring cost obeys:

$$H^* = \frac{\alpha - \beta}{s(1-\beta)}(p - b + k\theta).$$

when $\beta < \alpha$, the optimal hiring cost is positive while when $\beta > \alpha$ the optimal cost is negative (i.e. a hiring subsidy). It is possible to derive an alternative expression for the optimal hiring cost in terms of observed prices by noting that (10) and (11) imply:

$$k\theta = \frac{1-\beta}{\beta}(c - b + z - A).$$

Thus,

$$
\begin{aligned}
H^* &= \frac{\alpha-\beta}{s}\left(\frac{p}{1-\beta}+\frac{c+z-A}{\beta}-\frac{b}{\beta\,(1-\beta)}\right) \\
&= \frac{1}{s\beta}\frac{\alpha-\beta}{1-\alpha}\,(w-b)
\end{aligned}
\tag{16}
$$

We have then that the ideal hiring cost is proportional to the local wage level w net of the value of the leisure b. Presumably, b does not vary substantially across communities (at least relative to w). From (12) the wage is higher in more productive areas.

5 Place based hiring subsidies

The policy implications of condition (16) depend on the relative magnitude of the parameters β and α. When $\beta > \alpha$, equilibrium unemployment is too *high* relative to its social optimum. This occurs because high bargaining power on the part of workers leads to excessive wages and therefore too little job creation, with workers searches inefficiently crowding each other out. Efficiency can be restored in such cases by imposing a hiring subsidy.

By contrast, when $\beta < \alpha$, equilibrium unemployment is too *low* relative to its social optimum. In this case, low bargaining power on the part of workers leads to low wages and excessive job creation, with vacancies inefficiently crowding each other out. Efficiency can be restored in such cases via hiring costs, which, if too low can be bolstered by hiring taxes.

Most estimates of α place it at or above one half, with Shimer (2005) settling on a value of $\alpha = 0.72$. By contrast, labor economists examining the wage impact of shocks to firm profitability have repeatedly found estimates of β well below one half. Abowd and Lemieux (1993), for example, find in a sample of unionized plants in Canada that β is no greater than 0.4. Unsurprisingly, researchers studying environments where workers are less formally organized typically find much lower bargaining shares (Barth et al., 2011; Card, Devicienti, and Maida, 2010; Carlsson, Messina, and Skans, 2011; Guiso, Pistaferri, and Schivardi, 2005).

The empirical finding that $\beta < \alpha$ has the rather counter-intuitive implication that positive hiring costs are optimal. This does not imply however that existing hiring costs are too low or that hiring should be taxed. Although a calibration is beyond the scope of this paper, a variety of empirical estimates suggest that actual hiring costs are in fact very large (Bloom, 2009). One justification for place based policies then could be that hiring costs are too high – that is, that hiring costs take the value $\overline{H} > H^*$. In such cases efficiency can be restored via an offsetting hiring subsidy.

The optimal subsidy B^* takes the form:[7]

$$B^* = \overline{H} - \frac{1}{s\beta}\frac{\alpha-\beta}{1-\alpha}(w-b).$$

This subsidy is decreasing in w, providing a rationale for intervening more heavily in areas with lower wages. Indirectly, this suggests subsidizing areas with lower productivity.[8] Of course, $\overline{H}$ and b may themselves vary across cities due to differences in regulations and variation in the generosity of the social safety net. Areas with greater hiring costs require a larger subsidy for obvious reasons. Interestingly, areas with a more generous safety net also require a larger hiring subsidy.

6 Conclusion

In this paper, we study the efficiency of the spatial equilibrium when the labor market does not clear. We consider this exercise a first step in trying to understand under what conditions policies that alter the spatial equilibrium may be efficient.

We present a simple analogue of the standard Roback (1982) model where search frictions cause local unemployment. Although workers are perfectly mobile, equilibrium unemployment rates can vary across locations as a function of the productivity of the typical worker-firm match. We find that, depending on the magnitude of hiring costs, firms may post too few vacancies, especially in cities where the productivity of a match is low. In principle, this problem may be offset via place based policies that take the form of hiring subsidies for employers located in low productivity areas.

Hiring costs are not the only example of frictions that may plausibly depress local job creation. Another example is the presence of firing costs (Lazear, 1990; Bertola, 1990; Kugler and Saint-Paul, 2004; Hafstead, 2012). Although firing costs can be substantial in many European and developing countries, they have been understudied empirically. Their implications for place based policies are an important area for future research.

We stress that the goal of our exercise is not to propose a specific policy but to stimulate further research on the welfare implications of cross-market variation in local unemployment rates. An important limitation of our steady state analysis is that it neglects trends in productivity which may be important for understanding empirical differences between declining Rust Belt cities and growing labor markets in the South. We also caution that hiring subsi-

[7] Of course B^* is optimal only if one ignores the costs of raising the funds to pay for this subsidy. Raising the funds with taxes on labor will induce additional distortions.

[8] In a more general model where firms use land, wages would also depend negatively on the local amenity level. In such a case, areas with a more attractive mix of amenities ought to receive larger hiring subsidies.

dies may be prone to manipulation since officials cannot easily ensure that subsidies are not claimed on inframarginal workers whose hiring costs are already sunk from the perspective of the firm. Additional evidence on implementation of hiring subsidies and on the relation between hiring costs and local job creation rates is an important area for future work.

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Appendix

From (5) and (7)

$$J^F = \frac{k}{q(\theta)} + H$$

While from (6), we have that

$$J^F = \frac{p-w}{r+s}$$

Thus, the job creation side of the model requires

$$\frac{p-w}{r+s} = \frac{k}{q(\theta)} + H$$

which we rewrite:

$$q(\theta) = \frac{k(r+s)}{p-w-(r+s)H}. \tag{17}$$

Free mobility of workers and (2) imply that:

$$J^U = \frac{b+A-c+\theta q(\theta) J^E}{r+\theta q(\theta)} = \frac{z}{r}.$$

While solving (3) yields,

$$J^E = \frac{\frac{s}{r}z + w + A - c}{r+s}.$$

Thus, workers require that

$$b+A-c+\theta q(\theta)\left(\frac{\frac{s}{r}z+w+A-c}{r+s}\right) = \frac{z}{r}\left(r+\theta q(\theta)\right).$$

Which we rewrite:

$$\theta = \frac{z+c-b-A}{q(\theta)\left(\frac{w+A-c-z}{r+s}\right)}. \tag{18}$$

From (9), we have:

$$(1-\beta)\left(\frac{w+A-c-z}{r+s}\right) = \beta\frac{p-w}{r+s} - \beta H$$

which can be directly rearranged to yield equation (12) in the text.

Plugging (17) into (18) and using (12) we have:

$$\begin{aligned}\theta &= \frac{p-w-(r+s)\,H}{k}\frac{z+c-b-A}{w+A-c-z} \\ &= \frac{1-\beta}{\beta}\frac{p+A-c-z-(r+s)\,H}{k}\frac{z+c-b-A}{p+A-c-z-(r+s)\,H} \\ &= \frac{1-\beta}{\beta}\frac{z+c-b-A}{k} \qquad (19)\end{aligned}$$

We also have from (18) that

$$\theta q(\theta) = \frac{r+s}{\beta}\frac{z+c-b-A}{p+A-c-z-(r+s)\,H} \qquad (20)$$

Plugging this into (19), we get:

$$\frac{1-\beta}{\beta}\frac{z+c-b-A}{k}q(\theta) = \frac{r+s}{\beta}\frac{z+c-b-A}{p+A-c-z-(r+s)\,H}$$

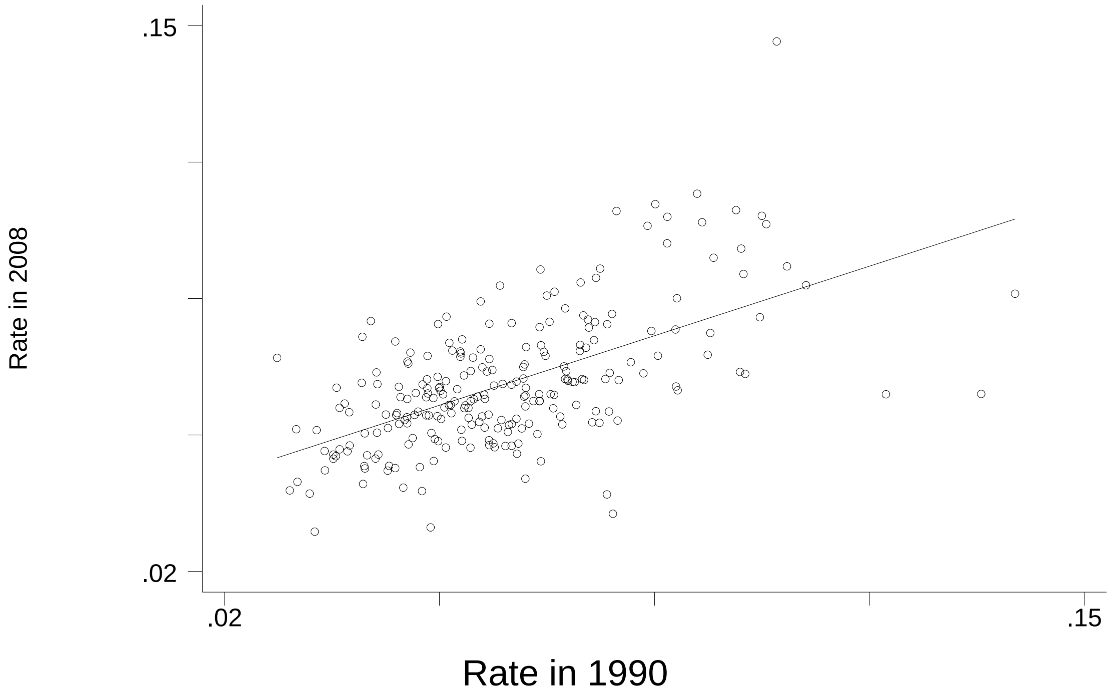
which can be rearranged to yield equation (11) of the text. Finally, plugging (11) into (20) and rearranging yields (10).

Table 1: Metropolitan Areas with the Highest and Lowest Unemployment Rate in 2008

Rank	Metropolitan Area	Unemployment Rate (1)	Conditional Unemployment Rate (2)
	Areas with the Highest Rate		
1.	Flint, MI	.1462	.1399
2.	Yuba City, CA	.1099	.1072
3.	Anniston, AL	.1074	.0899
4.	Merced, CA	.1060	.0948
5.	Toledo, OH/MI	.1058	.1064
6.	Yakima, WA	.1047	.0970
7.	Detroit, MI	.1044	.1082
8.	Chico, CA	.1031	.1092
9.	Modesto, CA	.1027	.1021
10.	Waterbury, CT	.1023	.0918
	Areas with the Lowest Rate		
276.	Provo-Orem, UT	.0391	.0369
277.	Madison, WI	.0389	.0511
278.	Odessa, TX	.0383	.0307
279.	Fargo-Morehead, ND/MN	.0362	.0467
280.	Charlottesville, VA	.0348	.0362
281.	Houma-Thibodoux, LA	.0337	.0107
282.	Billings, MT	.0304	.0324
283.	Rochester, MN	.0297	.0392
284.	Sioux Falls, SD	.0285	.0342
285.	Iowa City, IA	.0265	.0327

Notes: Data are from the 2008 American Community Survey. The sample includes all individuals in the labor force between the age of 14 and 70.
Conditional unemployment rates are obtained from an individual level linear probability model rehressing of an indicator for unemployment on metropolitan area indicators and indicators for education, age, gender and race.

Figure 1: Unemployment Rate in 1990 and 2008, by Metropolitan Area



Notes: Data are from the 1990 Census of Population and the 2008 American Community Survey. The sample includes all individuals in the labor force between the age of 14 and 70.