

A Theory of Slack

How Economic Slack Shapes Markets, Business Cycles, and Policies

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CHAPTER 12.

A unified treatment of labor-market policies

In the previous chapter we introduced the slackish labor market model. The model provides a unified theory of unemployment, involving both rationing unemployment—as in older models from the Keynesian tradition—and frictional unemployment—as in the modern DMP model.

As Diamond (2013, p. 37) observed, however, the decomposition of unemployment into rationing and frictional unemployment is here to clarify the mechanisms at play in the slackish model, but does not have direct policy implications:

This division [between rationing and frictional unemployment] sharpens awareness of the implications of the critical new modeling assumptions employed in [Michaillat (2012)]. It comes from comparing two notions of equilibrium, with and without a recruiting cost, which is used to capture the role of frictions.... The model has the property that ... the effect of unemployment benefits varies systematically with the tightness of the labor market ... While a comparison with the hypothetical frictionless alternative is a way of highlighting the workings of this effect, it is the direct estimate of the change in equilibrium from a policy change that we are really interested in.

Diamond's observation is entirely correct. In this chapter, we examine the direct effects of various policies on tightness, employment, and unemployment. These results describe how policies operate in tight and slack conditions in the slackish model—which can be directly used to design appropriate labor market policies.

We have seen, for instance in figure 11.7D, that rationing unemployment appears only when the labor market is slack enough; otherwise all unemployment is frictional. This dichotomy might make people think that the model's behavior is itself dichotomous—for instance that policies operate as in a DMP model when unemployment is frictional and differently when some unemployment comes from job rationing. But as we show in this chapter, this is not the case.

To illustrate how policies operate in the slackish labor market model, we consider three policies that operate on the labor market through three different channels: labor demand, labor supply, and Beveridge curve. The three policies are also present on many real-world labor markets: public employment, migration, and unemployment insurance. We will analyze all these policies using our tightness-employment diagram, and we will find that the effects of policies change smoothly with market tightness, and are not affected by the presence or absence of rationing unemployment. In fact, the effects of all the policies are governed by a single object in any state: the ratio of the labor supply and labor demand elasticities.

12.1. A labor-demand policy: public employment

In this section, we begin by describing the effects of a policy stimulating labor demand. Specifically, we look at the effect of public employment on the labor market. We characterize the public-employment multiplier, which is a typical statistic to describe the effects of this type of policy. The multiplier measures the number of workers added to the workforce when one worker is added to the public sector.

12.1.1. Modeling public employment

We make the public sector as similar to the private sector as possible to simplify the analysis. Essentially, we assume that the government behaves just like a private firm. If the government wants to hire a worker, it needs to post vacancies exactly like a private firm. The government also pays the same wage as private firms, and faces the same job separation rate. Because private and public jobs are the same, people indiscriminately apply for jobs in the public and private sectors.¹

¹These simplifying assumptions are not entirely accurate. In practice, in the United States, public jobs tend to differ from private jobs. A first difference concerns wages: during the New Deal, hourly wages were substantially lower in relief jobs than in private jobs (Neumann, Fishback, and Kantor 2010); and on average, public wages are higher and more rigid than private wages (Quadrini and Trigari 2007). A second difference concerns separation rates: public jobs have substantially lower separation rates than private jobs, and therefore last substantially longer (BLS 2025). Of course, if jobs differ in the two sectors, job seekers might direct their search toward a specific sector.

12.1.2. Solution of the model with public employment

The labor supply $l^s(\theta)$ is not affected by public employment: it remains given by (11.1). The only underlying difference is that the number of job vacancies used to compute labor market tightness now includes both private and public vacancies. Because we assumed that public and private jobs are the same, from workers' perspective, the fact that the government is an employer does not change anything. Public employment changes the number of vacancies, but for a given labor market tightness, whether the labor market is rich with private jobs or with public jobs does not matter.

The aggregate labor demand is composed of two elements: the labor demand from private firms and the labor demand from the government. We assume that the government employs a certain number of workers, g , so the public labor demand is simply g . The private labor demand $l^d(\theta)$ remains given by (11.9), because for a given labor market tightness, nothing has changed for private firms. Indeed, the presence of the government affects firms only through tightness. The aggregate labor demand amounts to $l^d(\theta) + g$.

Hence, with public employment, labor market tightness is determined by

$$(12.1) \quad l^d(\theta) + g = l^s(\theta).$$

Through the supply-equals-demand condition, public employment affects labor market tightness, and then total employment, given by $l^s(\theta)$, private employment, given by $l^d(\theta)$, and the unemployment rate $u(\theta)$, which remains given by (11.2).

The easiest way to see the impact of public employment is to turn to our tightness-employment diagram (figure 12.1A). The private labor demand corresponds to the labor demand without public employment, and the labor supply is the same as without public employment. The aggregate labor demand is the private labor demand plus public employment, g . The solution of the model is at the intersection of the labor supply and aggregate labor demand.

We immediately see the impact of adding public jobs to the labor market. Adding public jobs boosts labor market tightness and aggregate employment. As a result, it reduces unemployment.

What happens to private employment with the introduction of public jobs? Since tightness rises, private employment, given the private labor demand curve $l^d(\theta)$, falls. Indeed, when tightness is higher, firms are less prone to hiring because it is harder to recruit and thus less profitable to hire. Essentially as the government starts hiring workers, there are fewer unemployed workers to recruit and more vacancies. This added competition discourages private firms from recruiting: there is crowding out of private jobs by public jobs. As a result of crowding out, the increase in total employment is not as large as the initial increase in public employment.

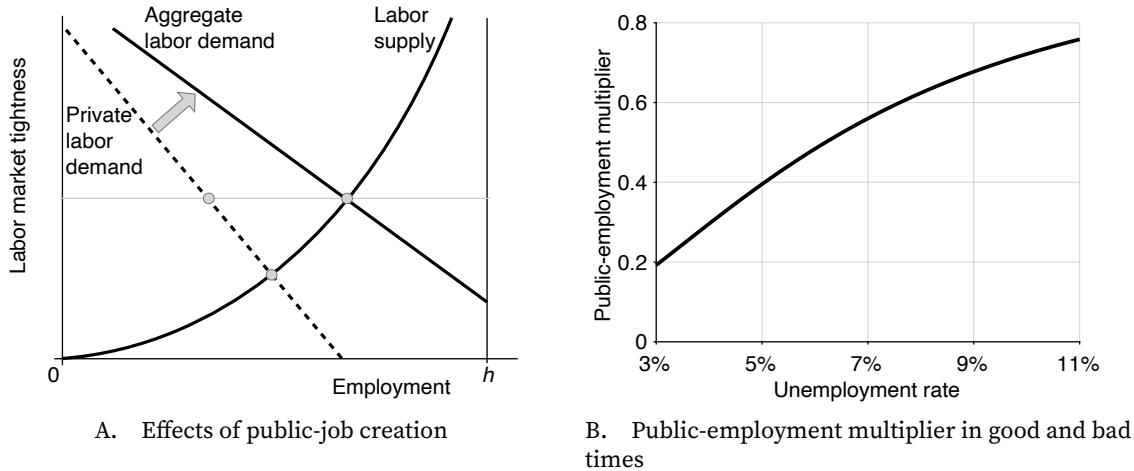


FIGURE 12.1. Public employment in the slackish labor market model

In panel A, the labor supply is given by (11.1), the private labor demand is given by (11.9), and the aggregate labor demand is just the private labor demand plus public employment, g . In panel B, the public-employment multiplier is given by (12.2) under the calibration in table 11.2.

What are the distributional effects of public employment? Workers benefit, since the employment rate improves and wages remain the same. Private firms, on the other hand, are hurt: firm profits fall after public jobs are created. Indeed, there are fewer workers in private firms, and a higher tightness, so fewer producers and hence less private output. But the firm profit share is just α , so firm profits are proportional to output: as output falls, so do firm profits. Overall, public employment is a policy that benefits workers but costs firm owners.

12.1.3. Public-employment multiplier

To quantify the effect of public employment on total employment, we compute the public-employment multiplier. The public-employment multiplier is the extra number of workers with a job when one extra worker is hired in the public sector:

$$\frac{dl}{dg}$$

A multiplier of 1 means that public jobs do not crowd out private jobs at all. A multiplier of 0 means that public jobs crowd out private jobs one-for-one, so total employment does not increase with public employment.

For simplicity and transparency, we evaluate the public-employment multiplier at the point where public employment is $g = 0$. So we compute the effect of the first worker employed in a public job on total employment.

To compute the multiplier, we differentiate the supply-equals-demand condition (12.1),

which implicitly defines tightness as a function of public employment:

$$\frac{dl^d}{d\theta} \cdot \frac{d\theta}{dg} + 1 = \frac{dl^s}{d\theta} \cdot \frac{d\theta}{dg}.$$

This expression gives the change in tightness generated by a change in public employment:

$$\frac{d\theta}{dg} = \frac{1}{\frac{dl^s}{d\theta} - \frac{dl^d}{d\theta}}.$$

Since the change in total employment generated by a change in public employment is obtained by measuring the movement along the labor supply curve, we get

$$\frac{dl}{dg} = \frac{dl^s}{d\theta} \cdot \frac{d\theta}{dg} = \frac{\frac{dl^s}{d\theta}}{\frac{dl^s}{d\theta} - \frac{dl^d}{d\theta}} = \frac{1}{1 - \frac{dl^d/d\theta}{dl^s/d\theta}}.$$

Since we evaluate the multiplier at $g = 0$, we have $l^s(\theta) = l^d(\theta) = l$. So we can multiply the two derivatives in the denominator of the multiplier expression by θ/l and transform them into elasticities. Accordingly, the public-employment multiplier is given by

$$(12.2) \quad \frac{dl}{dg} = \frac{1}{1 - \epsilon_{\theta}^d / \epsilon_{\theta}^s},$$

where ϵ_{θ}^d is the elasticity of private labor demand with respect to labor market tightness, given by (7.13), and ϵ_{θ}^s is the elasticity of labor supply with respect to labor market tightness, given by (9.14).

Hence, the properties of the public-employment multiplier are determined by the positive ratio between the tightness elasticity of labor demand and the tightness elasticity of labor supply. With our Cobb-Douglas matching function, the positive elasticity ratio is

$$(12.3) \quad -\frac{\epsilon_{\theta}^d}{\epsilon_{\theta}^s} = \frac{1 - \alpha}{\alpha} \cdot \frac{\sigma}{1 - \sigma} \cdot \frac{\tau(\theta)}{u(\theta)}.$$

As its name indicates, the positive elasticity ratio is strictly positive; it is also strictly increasing in tightness. As we discussed in chapter 9, the elasticity ratio determines the effects of demand and supply shocks in the slackish market model. In the slackish labor market model, it determines all the properties of the public-employment multiplier. This simply means that the public-employment multiplier is determined by the slope of private labor demand relative to labor supply.

From equations (12.2) and (12.3), we see that the public-employment multiplier is strictly positive, strictly less than 1, and strictly decreasing with tightness. This means

that creating public jobs increases total employment and reduces unemployment, but it reduces private employment—as illustrated in figure 12.1A. Furthermore, when tightness is lower, the multiplier is higher: public employment crowds out private employment less and reduces unemployment more. When tightness is higher, the multiplier is lower: public employment crowds out private employment more and reduces unemployment less. Since in the United States tightness is high in booms and low in slumps, we infer that public employment is more effective at reducing unemployment in slumps and less effective in booms—because then it crowds out private employment more.

The geometric intuition for the slack dependence of the multiplier is that relative to the labor demand curve, the labor supply curve is much flatter in a slack market than a tight market, as we saw in figures 9.2A and 9.2B. Hence, when the aggregate labor demand shifts, it boosts mostly employment and not tightness in a slack market, but it boosts mostly tightness and not employment in a tight market.

The economic intuition for the slack dependence is the following. In a slack market, the pool of unemployed workers is large, so when the government steps in and starts hiring workers out of that pool, it does not make a big difference for private firms. Additionally, the government needs few vacancies to hire public workers because the matching process is congested by jobseekers, so private vacancies do not have to compete with many new public vacancies. Overall, crowding out is low, so the multiplier is closer to one.

In a tight market, it is the opposite. The pool of unemployed workers is small, so if the government starts hiring the few workers who are looking for a job, it becomes much more difficult for firms to hire workers. Furthermore, the government needs many vacancies to hire additional workers because the matching process is congested by vacancies, so private vacancies now face more competition. Because of public hiring, it becomes much harder for firms to find workers, so firms are forced to cut back on hiring. Crowding out is substantial, and the multiplier is closer to zero.

Numerically, the public-employment multiplier takes a value of 0.46 at the average unemployment rate of 5.7% and is sharply slack dependent (figure 12.1B). When the unemployment rate is 3%, the public-employment multiplier is quite low, at 0.19. When the unemployment rate reaches 11%, the multiplier quadruples, and reaches 0.76. This means that when the government creates 10 jobs in the public sector, 8.1 private jobs are lost when unemployment is 3%, 5.4 private jobs are lost when unemployment is 5.7%, and only 2.4 private jobs are lost when unemployment is 11%. Accordingly, there are only 1.9 fewer unemployed workers when the unemployment rate is 3%, 4.6 fewer unemployed workers when the unemployment rate is 5.7%, but 8 fewer unemployed workers when the unemployment rate is 11%. The slack dependence—a form of state dependence—is significant.

A final result is that the public-employment multiplier would be 0 in the DMP model.

Mathematically, the DMP production function is linear, so $\alpha = 0$, which implies that the elasticity ratio $-\epsilon_{\theta}^d/\epsilon_{\theta}^s \rightarrow \infty$, and the multiplier converges to 0. In the generic slackish model, the number of jobs in the private sector is somewhat limited, so creating jobs in the public sector decreases unemployment. But there is no such lack of jobs in the DMP model, so when the government hires workers, it has absolutely no effect on unemployment: it only crowds out private employment one-for-one, leaving the number of unemployed workers unchanged.

12.1.4. Public employment in the United States

The effects of public employment in the model appear to align well with the effects of public employment observed in the United States.

To fight unemployment during the Great Depression, the Roosevelt administration launched the New Deal to employ millions of people who were without a job.² These workers were employed by the federal, state, and local governments as part of various programs, such as the Works Progress Administration, the Civil Works Administration, and the Federal Emergency Relief Administration. These workers were used, among other things, to build civil infrastructure across the country, including roads, schools, and dams. Interestingly, the crowding-out mechanism described in this chapter seems to have been at play at the time, and was certainly a concern for businessmen and policymakers. The government was concerned that the public jobs created by the New Deal might take away job applicants from firms, thus making it difficult to hire workers in the private sector. Neumann, Fishback, and Kantor (2010, p. 196) report that

The government tried to ensure the private industry was not affected by focusing work relief on building public works that had traditionally been the role of government. Moreover, work relief jobs were made less attractive by keeping work relief payments per hour worked well below private wages in most areas. Relief officials also encouraged workers to accept private employment when available. Despite these practices, private employers complained that WPA work relief made it more difficult for them to hire workers... Wallis and Benjamin's unpublished study of employment in an annual state panel suggests that an additional relief job was associated with a reduction of about half of a private job.

Second, we have found that public employment stimulates total employment more effectively when unemployment is high. Given that public employment is a form of public spending and employment translates into output, our result implies that at least in certain situations, public-spending multipliers, measuring the effect of public spending on output,

²See for instance Fleck (1999) and (Fishback 2007, pp. 395–401).

should be slack dependent: higher in a slack economy than in a tight economy. This result is supported by several studies.³

In their study of relief work in the United States during the Great Depression, Benjamin and Matthews (1992, chart 8) confirm both predictions of the theory: crowding out of private jobs by public jobs, and stronger crowding out in tighter markets. They compute the number of private jobs crowded out for each public relief job between 1933 and 1939. In 1933, at the worst of the Great Depression, each public job only crowded out about 0.3 private jobs, implying a public-employment multiplier of 0.7. The number of jobs crowded out increased to 0.4 in 1934, 0.6 in 1935–1936, 0.8 in 1937–1938, and 0.9 in 1939. Accordingly, the public-employment multiplier fell from 0.7 to 0.1 as the US economy recovered from the depression. These multiplier fluctuations are not too far off from those presented in figure 12.1B.

12.2. A labor-supply policy: migration

Next, we describe the effects of a policy stimulating labor supply: migration. We characterize the migration multiplier, which, in broad terms, measures the number of workers added to the workforce when one migrant worker is added to the labor force.

12.2.1. Modeling migration

To simplify the analysis, we assume that migrant workers are as similar as possible to local workers: they have the same productivity, command the same wage, and are hired through the same channels. Because local and migrant workers are the same, firms indiscriminately hire both types of workers.⁴

We also adjust the wage norm for the study of migration. We showed in section 6.4.3 that changes in the size of the labor force through migration do not generate noticeable changes in wages. To capture this fact, we slightly adjust the wage norm (11.8) and make it unresponsive to the labor force:

$$w^n = \omega \cdot a^{1-\gamma}.$$

12.2.2. Solution of the model with migration

The labor demand $l^d(\theta, w)$ is not affected by migration: it remains given by (11.6). The only underlying difference is that the number of job seekers used to compute labor market tightness now includes both local and migrant workers. Because we assumed that local

³See for instance Auerbach and Gorodnichenko (2012), Canelon and Lieb (2013), Fazzari, Morley, and Panovska (2015), and Ghassibe and Zanetti (2022).

⁴While these simplifying assumptions seem reasonable for internal migration, they might not be always accurate for international migration. In the United States, for instance, immigrant workers earn less but find jobs faster than native workers (Albert 2021).

and migrant workers are the same, from firms' perspective, the presence of migrant workers does not change anything. Because we have adjusted the wage norm to study migration, the expression of the labor demand incorporating the wage norm changes from (11.9) to

$$(12.4) \quad l^d(\theta) = \left[\frac{(1-\alpha)a^\gamma}{\omega} \right]^{1/\alpha} \cdot \frac{1}{[1+\tau(\theta)]^{1/\alpha-1}}.$$

The aggregate labor supply is composed of two elements: the labor supply from local workers and the labor supply from migrant workers. We denote the number of migrant workers in the labor force by i . The local labor supply $l^s(\theta)$ remains given by (11.1), because for a given labor market tightness, everything remains the same for local workers. Since local and migrant workers find and lose jobs at the same rate, they all face the same unemployment rate $u(\theta)$ given by (11.2), so the aggregate labor supply amounts to $[1-u(\theta)][h+i]$, which can be rewritten as

$$(12.5) \quad l^s(\theta) \left[1 + \frac{i}{h} \right],$$

where i/h is the number of migrant workers in the labor market as a share of the local labor force.

Hence, with migration, labor market tightness is determined by

$$(12.6) \quad l^d(\theta) = l^s(\theta) \left[1 + \frac{i}{h} \right].$$

Through the supply-equals-demand condition, migration affects labor market tightness, and then total employment, given by $l^d(\theta)$, local employment, given by $l^s(\theta)$, and the unemployment rate $u(\theta)$.

The easiest way to see the impact of migration is to turn to our tightness-employment diagram (figure 12.2A). The local labor supply corresponds to the labor supply without migration, and the labor demand is the same as without migration. The aggregate labor supply is the local labor supply plus the labor supply of migrants, $[1-u(\theta)] \cdot i$. The solution of the model is at the intersection of the labor demand and aggregate labor supply.

We immediately see the impact of migration on the labor market. The arrival of migrant workers depresses labor market tightness but stimulates aggregate employment. Because tightness falls, the unemployment rate—faced by both local and migrant workers—is higher. Since the unemployment rate increases and the size of the labor force increases, the total number of unemployed workers—some local and some migrant—increases sharply.

What exactly happens to local workers when migrant workers enter the labor market? Because tightness drops, local workers' job-finding rate drops. A lower job-finding rate

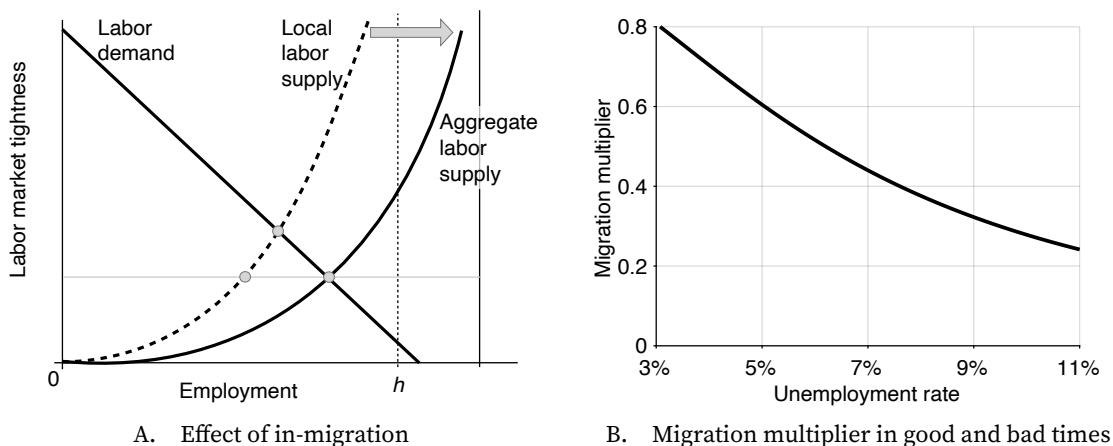


FIGURE 12.2. Migration in the slackish labor market model

In panel A, the labor demand is given by (12.4), the local labor supply is given by (11.1), and the aggregate labor supply is given by (12.5). In panel B, the migration multiplier is given by (12.7) under the calibration in table 11.2.

means a higher unemployment rate, so migration increases the unemployment rate faced by local workers and decreases their employment rate—given by the local labor supply $l^s(\theta)$. The underlying reason is that after an influx of migrant workers into the labor market, there is the same number of jobs but more job seekers, so it becomes harder to find a job. As a result, a larger fraction of local workers remains unemployed, and a smaller fraction is employed.

What are the distributional effects of migration? Local workers are clearly hurt, since the unemployment rate increases and wages remain the same. Local firms, on the other hand, benefit: firm profits increase once migrant workers enter the labor market. Indeed, firms employ more workers, and tightness is lower, so firms have more producers and generate more output. As firm profits are proportional to output, profits increase. Thus, migration is a policy that benefits local firms but hurts local workers—just the opposite of what happens with public employment.

12.2.3. Migration multiplier

To quantify the effect of migration on total employment, we compute the migration multiplier. The migration multiplier is the percentage increase in employment when one percent of the labor force migrates into the labor market:

$$\frac{h}{l} \cdot \frac{dl}{di}$$

A multiplier of 1 means that migrant workers are seamlessly absorbed into the labor market, without affecting local workers. A multiplier of 0 means that employed migrants

displace local workers one-for-one, so total employment does not increase with migration.

For simplicity and transparency, we evaluate the migration multiplier at the point where migration is $i = 0$. So we compute the effect of the first migrant workers entering the labor market.

To compute the multiplier, we differentiate the supply-equals-demand condition (12.6), which implicitly defines tightness as a function of migration:

$$\frac{dl^d}{d\theta} \cdot \frac{d\theta}{di} = \frac{dl^s}{d\theta} \cdot \frac{d\theta}{di} \cdot \left[1 + \frac{i}{h}\right] + l^s(\theta) \cdot \frac{1}{h}.$$

This expression gives the change in tightness generated by a change in migration:

$$\frac{d\theta}{di} = \frac{l^s(\theta)}{h} \cdot \frac{1}{\frac{dl^d}{d\theta} - \frac{dl^s}{d\theta} \cdot \left[1 + \frac{i}{h}\right]}.$$

Since the change in total employment generated by a change in migration is obtained by measuring the movement along the labor demand curve, we get

$$\frac{dl}{di} = \frac{dl^d}{d\theta} \cdot \frac{d\theta}{di} = \frac{l^s(\theta)}{h} \cdot \frac{\frac{dl^d}{d\theta}}{\frac{dl^d}{d\theta} - \frac{dl^s}{d\theta} \cdot \left[1 + \frac{i}{h}\right]} = \frac{l^s(\theta)}{h} \cdot \frac{1}{1 - \frac{dl^s/d\theta}{dl^d/d\theta} \cdot \left[1 + \frac{i}{h}\right]}.$$

Since we evaluate the multiplier at $i = 0$, we have $l^s(\theta) = l^d(\theta) = l$ and $i/h = 0$. So in particular we can multiply the two derivatives in the denominator by θ/l and transform them into elasticities. Accordingly, the migration multiplier is given by

$$(12.7) \quad \frac{h}{l} \cdot \frac{dl}{di} = \frac{1}{1 - \epsilon_{\theta}^s / \epsilon_{\theta}^d},$$

where ϵ_{θ}^d is the elasticity of labor demand with respect to labor market tightness, given by (7.13), and ϵ_{θ}^s is the elasticity of local labor supply with respect to labor market tightness, given by (9.14).

Hence, just like the public-employment multiplier, the properties of the migration multiplier are determined by the positive ratio between the tightness elasticity of labor demand and the tightness elasticity of labor supply, given by (12.3). This again means that the migration multiplier is determined by the slope of labor demand relative to local labor supply.

From equations (12.7) and (12.3), we see that the migration multiplier is strictly positive, strictly less than 1, and strictly increasing with tightness. This means that the arrival of migrant workers increases total employment, but it reduces local employment and raises local unemployment—exactly as illustrated in figure 12.2A. Furthermore, when tightness

is lower, the multiplier is lower: migrant workers displace local workers and increase local unemployment more. When tightness is higher, the multiplier is higher: migrant workers displace local workers and increase local unemployment less. Since in the United States tightness is high in booms and low in slumps, we infer that migration has more adverse effects on local workers in slumps and less adverse effects in booms.

The geometric intuition for the slack dependence of the multiplier is that relative to the labor demand curve, the local labor supply curve is much flatter in a slack market and much steeper in a tight market, as we saw in figures 9.2C and 9.2D. Hence, when the aggregate labor supply shifts, the resulting drop in tightness has a large adverse effect on local employment in a slack market, but a small adverse effect on local employment in a tight market.

The economic intuition for the slack dependence is the following. In a slack market, the pool of unemployed workers is large, so the matching process is congested by job seekers, and it is easy for firms to recruit workers. The arrival of migrant workers only adds to the job-seeker congestion, and does not make it noticeably easier for firms to hire—since they already have no issue recruiting. Since recruiting is not much easier, firms do not create many new jobs and the multiplier is low. This also means that most of the jobs that migrant workers get are obtained at the expense of local workers.

In a tight market, the opposite occurs. The pool of unemployed workers is small, and the matching process is congested by vacancies. The arrival of migrant workers relaxes the vacancy congestion and makes it much easier for firms to recruit. Facing much easier hiring, firms create many new jobs, so the multiplier is larger. As a result, migrant workers fill new jobs and do not displace local workers much.

Numerically, the migration multiplier takes a value of 0.54 at the average unemployment rate of 5.7% and is sharply slack dependent (figure 12.2B). When the unemployment rate is 3%, the migration multiplier is quite high, at 0.80. When the unemployment rate reaches 11%, the multiplier is much smaller, dropping to 0.24. This means that when a wave of migrants amounting to 10% of the labor force arrive in the labor market, broadly, the number of jobs increases by 8% when unemployment is 3%, by 5.4% when unemployment is 5.7%, and only 2.4% when unemployment is 11%. So, roughly, after the wave of migration, the unemployment rate increases by 2pp when the initial unemployment rate is 3%, by 4.6pp when the initial unemployment rate is 5.7%, and by 7.6pp when the initial unemployment rate is 11%. The slack dependence is again significant.

A final result is that the migration multiplier would be 1 in the DMP model. The mathematical argument is the same as in the case of the public-employment multiplier: the DMP production function is linear ($\alpha = 0$), so the ratio $\epsilon_{\theta}^s/\epsilon_{\theta}^d \rightarrow 0$ (as can be seen from (12.3)), and the multiplier converges to 1. In the generic slackish model, the number of jobs is somewhat limited, so the arrival of migrant workers puts upward pressure on

the unemployment rate. But there is no such lack of jobs in the DMP model, so when migrant workers arrive, they are seamlessly absorbed: the unemployment rate remains unchanged, and employment grows in proportion to the number of arrivals. This could be seen in the tightness-employment diagram of figure 11.8A. The labor supply shifts outward with migration, moving the labor market along the horizontal labor demand: tightness does not change and the unemployment rate is unaffected.

12.2.4. Migration in the United States

The slackish labor market model predicts that an influx of new workers into a local labor market raises the unemployment rate among local workers. US evidence collected from domestic migration during the Great Depression and international migration from Cuba supports this prediction.

Boustan, Fishback, and Kantor (2010) study the effect of internal migration in the United States during the Great Depression. Just like native workers protest immigration from abroad, locals in areas where the depression was less severe protested against the arrival of migrants from other less fortunate regions. Locals accused newcomers of taking jobs away from them. For example, Californians tried to scare possible migrants away from the state, highlighting how slack the Californian labor market was. A billboard in Oklahoma carried the message “NO JOBS in California / If YOU are looking for work—KEEP OUT / 6 men for every job / No state relief available for non-residents” (Boustan, Fishback, and Kantor 2010, p. 720).

To assess the impact of internal migrants on local residents, Boustan, Fishback, and Kantor (2010) use variation in the generosity of New Deal programs and extreme weather events to instrument for migrant flows to and from US cities. They find that in-migration prompted some residents to move away from their city and others to lose weeks of work or access to relief jobs. They estimate that for every 100 arrivals, 21 locals were displaced from relief jobs. An additional 19 local workers were forced to shift from full-time to part-time work. And a further 19 residents moved out to other cities. They also find that, just as in-migration diminished the work opportunities of local workers, out-migration improved local opportunities symmetrically.

Perhaps surprisingly, the results from Card (1990)’s famous study on the impact of the Cuban immigrants from the Mariel Boatlift on the Miami labor market in the 1980s are not inconsistent with migration-induced unemployment. Card finds that the unemployment rate for Cuban workers increased drastically after the boatlift: “Unlike the situation for whites and blacks, there was a sizable increase in Cuban unemployment rates in Miami following the Mariel immigration. Cuban unemployment rates were roughly 3 percentage points higher during 1980-81 than would have been expected on the basis of earlier (and later) patterns” (Card 1990, p. 251). The fact that the Cuban workers faced a higher

unemployment rate is evidence that the labor market could not absorb all new arrivals, and that jobs were somewhat rationed. In fact, the boatlift raised the Cuban labor force in Miami by 20% (Card 1990, p. 246). So for each 100 new arrivals into Miami's Cuban labor force, $3/20 \times 100 = 15$ local Cubans were pushed into unemployment.

Relatedly, Anastasopoulos et al. (2021, figure 5) compute the response of labor-market tightness in Miami upon the arrival of Cuban immigrants from the Mariel Boatlift in the 1980s. Relative to the tightness in comparable cities, they find that Miami tightness fell by 40% after the Mariel Boatlift. This implies that it became much harder for local workers to find jobs after the boatlift.

12.2.5. Departure from the academic consensus on migration

This slackish model and empirical evidence presented in this section suggest that in-migration raises local unemployment. Yet, academic economists tend to reject the notion that in-migration negatively affects local workers (Raphael and Ronconi 2007). Federman, Harrington, and Krynski (2006, p. 302) observe for instance:

One of the central questions in the debate over immigration policy is whether immigrants adversely affect labor market outcomes for natives. Some Americans believe they do, worrying that immigrants take jobs away from native workers. Most of the empirical evidence produced by economists, however, does not support these concerns.

The general perception by academic economists that immigration has no adverse effect on local workers might be an indirect consequence of not having models to think about the effect of migration on unemployment—neither the Walrasian model nor the DMP model allows immigration to raise unemployment. If such a phenomenon was present in existing models, researchers might have paid more attention to the empirical findings in existing studies. As Michailat (2025, table 1) shows, experimental evidence from different countries and historical periods, involving both international and domestic migrations, paints a consistent pattern: an influx of new workers into a local labor market raises the unemployment rate among local workers.

Because existing models only allow migration to affect wages, the empirical literature has focused on wages, which do not appear to respond much to immigration. This has created a puzzle: “The depth of public concern over immigration is somewhat puzzling, given that most studies find only small economic impacts on the native population” (Card, Dustmann, and Preston 2012, p. 78). The adverse impact of immigration on unemployment is not emphasized at all in economic research—but it is often there, offering a resolution of the puzzle.

The absence of migration-induced unemployment in existing migration models severely

TABLE 12.1. Popular perceptions about immigration

| | How likely is it? | | | |
|--|-------------------|------|----------|------------|
| | Extremely | Very | Somewhat | Not at all |
| The growing number of these immigrants takes jobs away from people already here. | | | | |
| Hispanics | 20% | 29% | 38% | 13% |
| Asians | 19% | 30% | 37% | 13% |

Source. 1992 American National Election Studies survey. The responses to the question about Hispanic workers (question Q4c) can be accessed at <https://electionstudies.org/data-tools/anes-variable/variable.html?year=1992&variable=V926238>. The responses to the question about Asian workers (question Q5c) can be accessed at <https://electionstudies.org/data-tools/anes-variable/variable.html?year=1992&variable=V926241>.

limits the scope of empirical inquiry about migration. A wonderful example of such limitation appears in a seminal paper by Scheve and Slaughter (2001). The paper documents people’s perceptions about immigration. Scheve and Slaughter (2001, footnote 8) candidly admit that they do not examine people’s perception of job stealing because such perceptions would be inconsistent with the effects of immigration in standard models:

The 1992 National Election Studies survey asked other questions about immigration that we do not analyze. For example, respondents were asked whether they think Asians or Hispanics ‘take jobs away from people already here.’ We do not focus on this question because its responses cannot clearly distinguish among our three competing economic models. All our models assume full employment, so no natives could have jobs ‘taken away’ by immigrants.

The response of respondents in the 1992 National Election Studies is presented in table 12.1. More than 80% of respondents are indeed worried that Hispanic and Asian immigrants take jobs away from them. It is quite possible that the existence of migration-induced unemployment has not received the attention it deserves just because standard models do not feature it.

The public anxieties about migration often focus on the idea that migrant workers "steal jobs" from local workers (as displayed in table 12.1). Given this section’s results, these anxieties are unsurprising. In a slackish model, the job-finding rate and employment rate of local workers both fall when immigrants arrive. So local workers in the model might feel that immigrants steal their jobs: the fraction of local workers who have a job is lower, and the fraction who remain unemployed is higher. The reason is that immigrant workers are now employed in some of the available jobs, relegating local workers to unemployment.

Of course the labor market is not zero-sum: the number of jobs is not fixed, so displacement is not one-for-one. But displacement does exist, and is especially strong in bad times. In that way, the labor market becomes closer to zero-sum in bad times, perhaps

explaining why the pushback against immigration intensifies in depressed labor markets. Hoffman (1974) shows for instance that high unemployment and cut-throat competition for existing jobs during the Great Depression intensified anti-Mexican sentiment, leading to the pressured or forced repatriation of half a million Mexicans from the United States between 1929 and 1939. As Hoffman (1974, p. 2) explains, “With the onset of the depression, pressure mounted to remove aliens from the relief rolls and . . . from the jobs they were said to hold at the expense of American citizens.”

12.3. A Beveridge-curve policy: unemployment insurance

Migration affects the labor supply but not the Beveridge curve, which is invariant to the size of the labor force. We finally look at a policy that affects the labor supply via the Beveridge curve: unemployment insurance.

12.3.1. Modeling unemployment insurance

Unemployment insurance (UI) improves the lot of unemployed workers by providing them with benefits when they have no labor income. However, UI has two possible adverse effects on the labor market.

First, UI might depress labor demand by raising wages. Indeed, UI elevates the outside option of job seekers, so if they bargain with firms, they might be able to obtain higher wages. However, we showed in section 6.4.3 that changes in UI have no observable effects on wages. We therefore omit this channel here and assume that wages are unaffected by UI, and remain given by (11.8).

Second, UI might depress labor supply by reducing job-search effort and therefore keeping workers in unemployment longer. This effect has been well documented (Krueger and Meyer 2002). For instance, using the Continuous Wage and Benefit History dataset, which contains administrative data from 12 US states, Katz and Meyer (1990, p. 45) find that a one-week increase in benefit duration increases the average duration of the unemployment spells of UI recipients by about 0.2 weeks. Accordingly, we assume that UI reduces the job-search effort e of unemployed workers.

We’ve been looking at policies that boost unemployment all along in this chapter. For consistency, here too we consider a policy change that boosts employment: a cut in UI benefits.

12.3.2. Solution of the model with unemployment insurance

The labor demand $l^d(\theta, w)$ is unaffected by UI, and wages are unaffected by UI, so the expression of the labor demand incorporating the wage norm remains (11.9). The labor

supply now incorporates the job-search effort of unemployed workers, which enters the labor supply as shown in (11.25). Hence, with UI, labor market tightness is determined by

$$(12.8) \quad l^d(\theta) = l^s(\theta, e).$$

A UI cut boosts job-search effort e , and then through the supply-equals-demand condition, affects labor market tightness, total employment, given by $l^d(\theta)$, and the unemployment rate, $u = 1 - l^d(\theta)/h$.

The easiest way to see the impact of a cut in UI benefits is to turn to our tightness-employment diagram (figure 12.3A). The UI reduction stimulates labor supply without affecting the labor demand. Hence, it reduces labor market tightness and stimulates employment, as the labor market moves down the labor demand curve. Because employment rises, the unemployment rate is lower: unemployed workers search harder, so they find jobs faster, which shrink the unemployment pool. However, because tightness falls, the increase in employment is not as large as the shift in labor supply: after shifting, the labor market moves down the labor supply to the new intersection with labor demand.

Although that's not visible in the tightness-employment diagram, a cut in UI also improves the location of the Beveridge curve, moving it inward in a vacancy-unemployment diagram (figure 12.3B). Indeed, with job-search effort e , the Beveridge curve is implicitly defined by the balanced-flow condition:

$$(12.9) \quad \lambda(1 - u) = m(e \cdot u, v).$$

As the value of e increases, lower values of u and v are required to satisfy the condition.

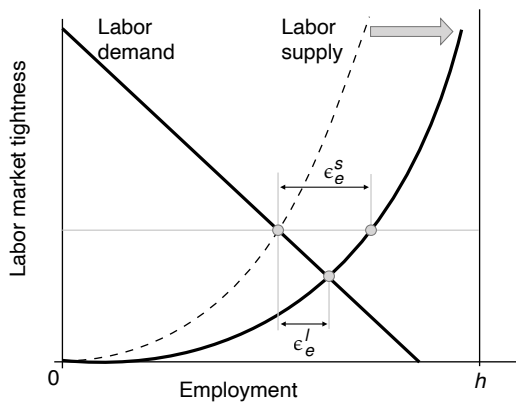
12.3.3. UI multiplier

To quantify the effect of UI on total employment, we compute the UI multiplier. The UI multiplier is the ratio of the elasticity of employment with respect to effort to the elasticity of labor supply with respect to effort:

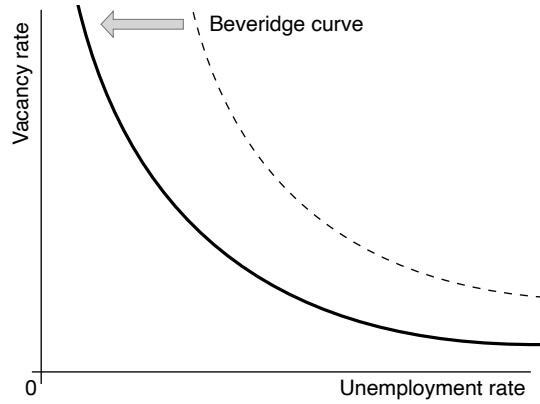
$$\frac{\epsilon_e^l}{\epsilon_e^s}.$$

The UI multiplier has a more complicated definition than the public-employment and migration multipliers because UI operates on the labor market in a slightly more complicated way. A UI multiplier of 1 means that the increase in job-search effort directly translates into an increase in employment: the increase in employment is the same as the shift in labor supply generated by higher effort. A multiplier of 0 means that the increase in job-search effort has no effect on employment.

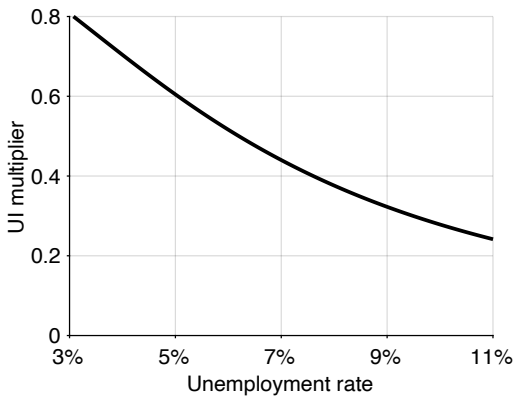
We can rewrite the UI multiplier in an informal way that might nonetheless be useful



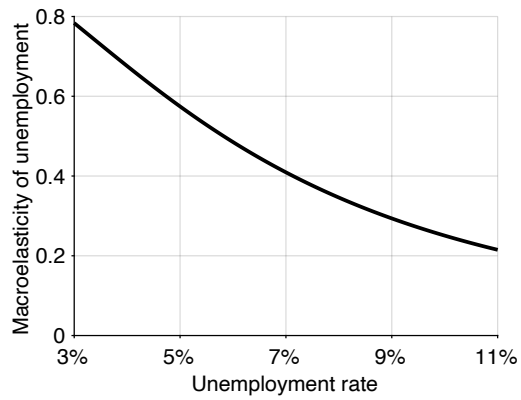
A. Effects of a UI reduction



B. Effects on the Beveridge curve



C. UI multiplier in good and bad times



D. Macroelasticity of unemployment in good and bad times

FIGURE 12.3. UI in the slackish labor market model

In panel A, the labor demand is given by (11.9), and the labor supply is given by (11.25). In panel B, the Beveridge curve is implicitly given by (12.9). In panel C, the UI multiplier is given by (12.10) under the calibration in table 11.2. In panel D, the macroelasticity of unemployment with respect to job-search effort is given by (12.11) under the calibration in table 11.2.

with intuition:

$$\frac{\epsilon_e^l}{\epsilon_e^s} = \frac{\frac{e}{l} \cdot \frac{dl}{de}}{\frac{e}{l^s} \cdot \frac{\partial l^s}{\partial e}} = \frac{dl}{dl^s|_{\theta}},$$

where we simplified the expression using the fact that we take elasticities around the point where $l^s(\theta, e) = l$. In that way, we see that the UI multiplier is the change in employment relative to the shift in labor supply triggered by high search effort.

For simplicity and transparency, we evaluate the UI multiplier at the point where effort is $e = 1$. So we compute the effect of the initial departure of job-search effort from its normal value.

To compute the UI multiplier, we implicitly differentiate the supply-equals-demand condition (12.8) with elasticities (result B.10):

$$\epsilon_{\theta}^d \cdot \epsilon_e^{\theta} = \epsilon_{\theta}^s \cdot \epsilon_e^{\theta} + \epsilon_e^s.$$

This expression gives the elasticity of tightness with respect to job-search effort:

$$\epsilon_e^{\theta} = \frac{\epsilon_e^s}{\epsilon_{\theta}^d - \epsilon_{\theta}^s}.$$

Since the change in employment generated by a change in effort is obtained by measuring the movement along the labor demand curve, we get

$$\epsilon_e^l = \epsilon_{\theta}^d \cdot \epsilon_e^{\theta} = \epsilon_e^s \cdot \frac{\epsilon_{\theta}^d}{\epsilon_{\theta}^d - \epsilon_{\theta}^s} = \epsilon_e^s \cdot \frac{1}{1 - \epsilon_{\theta}^s / \epsilon_{\theta}^d}.$$

Accordingly, the UI multiplier is given by

$$(12.10) \quad \frac{\epsilon_e^l}{\epsilon_e^s} = \frac{1}{1 - \epsilon_{\theta}^s / \epsilon_{\theta}^d},$$

where ϵ_{θ}^d is the elasticity of labor demand with respect to labor market tightness, given by (7.13), and ϵ_{θ}^s is the elasticity of local labor supply with respect to labor market tightness, given by (9.14).

The UI multiplier is exactly the same as the migration multiplier, given by (12.7), so it has the same properties: the UI multiplier is strictly positive, strictly less than 1, and strictly increasing with tightness.

This means that a cut in UI, by stimulating search effort, increases total employment, but not as much as the shift in labor supply would suggest. The increase in employment is less than the supply shift because labor market tightness drops—as displayed in figure 12.3A. Furthermore, when tightness is lower, the multiplier is lower: a cut in

UI stimulates employment and reduces unemployment less. Since the US labor market tightness is high in booms and low in slumps, we infer that a cut in UI is more potent to raise employment in booms and less potent in slumps.

The economic intuition for the slack dependence is the following. In a slack market, the pool of unemployed workers is already large, so the matching process is congested by job seekers, and it is easy for firms to recruit workers. Forcing jobless workers to search harder only adds to the job-seeker congestion, and does not make it noticeably easier for firms to hire—since they already have no issue recruiting. As recruiting is not noticeably easier, firms do not create many new jobs, so employment barely increases despite the higher effort: the multiplier is low. At that point the labor market operates almost like a rat race: by searching harder job seekers improve their position in the queues for jobs, but this improved position only comes at the expense of other job seekers. The number of jobs is almost fixed—almost independent of labor supply.

In a tight market, the opposite occurs. The pool of job seekers is small, and the matching process is congested by vacancies. The increase in job-search effort drastically relaxes the vacancy congestion and makes it much easier for firms to recruit. Facing much easier hiring, firms create many new jobs, so the multiplier is larger. Job seekers fill the new jobs and do not noticeably displace other job seekers in the queues for jobs.

The UI multiplier is the same as the migration multiplier, so it takes the same numerical values (figure 12.3C). Thus, the response of employment to a UI cut is 80% of the response of labor supply when the unemployment rate is 3%, 54% at the average unemployment rate of 5.7%, and only 24% when the unemployment rate reaches 11%. This means that as the unemployment rate increases, less and less of the labor-supply shift produced by the UI cut translates into an increase in employment and a reduction in unemployment.

Landais, Michaillat, and Saez (2018b,a) refer to ϵ_e^l as macroelasticity, including effects of individual search effort and labor market tightness, and ϵ_e^s as a microelasticity, including only effects of individual search effort. This section therefore shows that the macroelasticity is less than the microelasticity, especially in slack labor markets.

There is a macroelasticity that is closely related to the UI multiplier and that we can compute numerically to finalize the results: the macroelasticity of unemployment with respect to job-search effort, which captures the percentage decrease in unemployment when job-search effort increases by 1%:

$$(12.11) \quad -\epsilon_e^u = \frac{1 - u}{1 - \epsilon_\theta^s / \epsilon_\theta^d}.$$

The macroelasticity of unemployment is just $1 - u$ times the UI multiplier, so it is quite close in value to it, and has the same properties: it is strictly positive, strictly less than 1,

and strictly increasing with tightness.⁵ This means that by raising job-search effort, a cut in UI reduces unemployment, and the reduction is especially strong in tight labor markets. In the calibration, the macroelasticity decreases from 0.78 when the unemployment rate is 3%, to 0.51 at the average unemployment rate of 5.7%, and down to only 0.21 when the unemployment rate reaches 11%. This means that a 10% increase in job-search effort reduces the unemployment rate by 7.8%, then 5.1%, and then only 2.1% as the unemployment rate grows from 3% to 11%.

A final result is that the UI multiplier would be 1 in the DMP model—just like the migration multiplier. The reason is again the same: there is no lack of jobs in the DMP model, so when unemployed workers search harder, they are seamlessly absorbed into new jobs: tightness remains unchanged, and employment grows as much as the labor supply shifts. This could be seen in the tightness-employment diagram of figure 11.8A. The labor supply shifts outward with a cut in UI, moving the labor market along the horizontal labor demand: tightness does not change and the employment increase is determined by the labor supply shift. In the DMP model, the macroelasticity of unemployment with respect to job-search effort, given by (12.11), is $-\epsilon_e^u = 1 - u$, so it is always approximately equal to 1.

12.3.4. Unemployment insurance in the United States

The slackish labor market model predicts that reducing UI, by incentivizing job search, raises employment and reduces the unemployment rate. However, the effect on employment is less than the underlying shift in labor supply because labor market tightness drops. US evidence collected during the Great Recession and before appears in line with the prediction.

The most direct evidence comes from the work by Marinescu (2017), who measures how labor market tightness responded to the UI extensions implemented in the United States between 2008 and 2011. As we discussed in section 11.4.7, with varying search effort, labor market tightness is the ratio of job vacancies to aggregate search effort, which is itself individual search effort times number of job seekers. Typically it's difficult to measure such a tightness because job-search effort is unobservable. But Marinescu is able to do it using data from major job board CareerBuilder.com, which contains information on job vacancies posted by firms and job applications sent by job seekers, which serves as a measure of job search effort. With an event-study design, she finds that the UI extensions reduced the number of job applications without affecting the number of vacancies. This means that an increase in UI raised labor market tightness, and that a decrease in UI

⁵We obtain the macroelasticity in three steps. First, given (11.25), we see that $\epsilon_e^s = 1 - l/h = u$. Second, since $u = 1 - l/h$, we know that $\epsilon_e^u = -\epsilon_e^l \cdot (1 - u)/u$. Third, we conclude that $-\epsilon_e^u = (1 - u) \cdot (\epsilon_e^l/\epsilon_e^s)$, which yields (12.11) given that $\epsilon_e^l/\epsilon_e^s$ is given by (12.10).

would lower tightness, as the slackish model predicts.

Another way to measure the effect of UI on tightness is to examine the effect of changing UI on workers who do not receive UI. If there are spillovers between insured and uninsured job seekers, we would know that labor market tightness has changed. For instance, if uninsured job seekers exit unemployment faster when insured job seekers in their market receive more generous UI, we would learn that the increase in UI has raised tightness. Levine (1993) studies such spillovers in various US datasets and finds that when UI increases in certain labor markets, insured job seekers in those markets search less, and uninsured job seekers in the same markets find jobs faster. This implies that uninsured job seekers benefited from a higher job-finding rate, and therefore that labor market tightness increased after UI increased. Conversely, it means that tightness would decrease after UI decreased, as the slackish model says.

Finally, the slackish model predicts that the macroelasticity of unemployment with respect to job-search effort is smaller in slacker markets. This finding reflects this property of the model: when the labor market is slack, an increase in job-search effort cannot lower unemployment much as jobs are rationed. Toohey (2017) obtains evidence supporting this prediction. He exploits variations in job-search requirements in UI programs across US states and over time. He finds that when search requirements are more stringent, UI recipients search more and find jobs faster. But increasing search effort has a smaller effect on the unemployment rate in bad times than in good times, as the slackish model predicts.

12.4. Summary

In this chapter, we study the effects of common labor policies in the slackish labor market model of chapter 11: public employment, migration, and unemployment insurance. The model connects these policies although they operate on the labor market through different channels: labor demand, labor supply, and Beveridge curve. The aim is to understand how these policies might affect unemployment and tightness.

The main finding is that all these policies affect both tightness and unemployment, and are strongly state dependent. Because jobs are somewhat scarce, public employment does not completely crowd out private employment and so reduces unemployment. The reduction is especially large in bad times. For the same reason, in-migration is not completely absorbed in the labor market and so raises unemployment. The rise is especially large in bad times, when jobs are scarcer. Finally, the increase in unemployment caused by a rise in unemployment insurance is not as large as what the reduction in job-search effort would suggest. The increase in unemployment is especially small in bad times, when frictional unemployment is low. Formally, the effects of all the policies are governed by a single statistic: the ratio of the labor supply and labor demand elasticities.

None of these policy properties can be true without the others—they all arise from job rationing. This means that, within the confines of the model, it would not be logical to believe jointly (as a Democrat might) that government spending can stimulate employment and that local workers are unaffected by immigration. It would not be logical either to believe jointly (as a Republican might) that unemployment insurance has a substantial adverse effect on employment and that local workers are adversely affected by immigration.

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