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Wage Compression, Employment Restrictions, and Unemployment: The Case of Mauritius

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Finance Department

**Wage Compression, Employment Restrictions, and Unemployment:
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Abstract

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Governments often intervene in labor markets with the aim of reducing inequality and promoting employment. Such intervention often results in wage compression and restrictions on how firms use their workers. This paper investigates the impact of such interventions on the labor market conditions faced by low-skill workers in Mauritius. It finds that even relatively minor intervention can dramatically increase the fragility of jobs, the length of unemployment spells, as well as the extent of unemployment and labor market churning. With institutions of the type studied here common across many different types of countries, these results have relatively general implications.

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Contents	Page
I. Introduction	3
A. Mauritius's Unemployment Problem	3
B. Mauritius's Labor Market Institutions	5
II. Evolution of Employment in the EPZ (Textiles) Sector	5
III. An Assessment of the Impact of Wage Setting and Redeployment Restrictions	7
A. Model Environment and Equilibrium	8
Wage Determination: Decentralized Bargaining	10
Wage Determination: Exogenous Wage Schedule	11
B. Calibration	13
C. Empirical Results	14
IV. Conclusion	17
References	19
Figures	
1. Decomposition of Annual EPZ Employment Growth, 1983-2002	6
2. Annual EPZ Employment Growth and Reallocation Rates, 1983-2002	6
3. Decomposition of Quarterly EPZ Employment Growth, 1986-2003	7
4. Average Size of New and Closing Firms, 1986-2003	7
5. The Impact of Labor Market Institutions	13
6. Cross-Market Wage Compression: Unemployment and Job Destruction	16
7. Within-Market Wage Compression: Unemployment and Job Destruction	17
8. Worker Redeployment: Unemployment and Job Destruction	17
Tables	
1. Quarterly Job Flow Rates	8
2. Model Output: The Impact of Labor Market Restrictions	15

I. INTRODUCTION

Some government interference in the operation of labor markets is almost universal. This interference is often motivated by a desire to affect the distribution of income, and promote employment. Motivated in this way, many governments implement policies that compress the wages that firms pay, and reduce the flexibility with which employers may use (or redeploy) their employees.² This paper investigates consequences of such policies for the labor market faced by low-skill workers in Mauritius. The results suggest that even relatively minor wage compression and restrictions on the redeployment of workers can have a dramatic impact on the fragility of jobs, the length of unemployment spells, as well as the extent of unemployment and labor market churning. Moreover, restrictions on the flexibility of the labor market are likely to become increasingly important as an economy faces structural challenges, as Mauritius currently does.

Although this paper focuses on the Mauritian labor market, the issues studied in it are relevant for many countries. Both wage compression and restrictions on the redeployment of workers are prevalent in many advanced economies. For example, Bertola and Rogerson (1997) and Organization for Economic Cooperation and Development (OECD, 1994) document considerable wage compression in western Europe, while OECD (1995) suggests that insufficient flexibility inhibits job creation in several advanced economies. Similar institutions, especially over the setting of wages, also appear to be important in many transitional economies (Svejnar, 1999; Haltiwanger and Vodopivec, 2002).

A. Mauritius's Unemployment Problem

Notwithstanding impressive economic growth, Mauritian unemployment has increased in every year since 1991, with the unemployment rate reaching 10.2 percent in 2003. As in many countries, this unemployment is primarily experienced by low-skill workers.³ In response to this growing unemployment problem, the government has begun to address the problem of apparent skills mismatch through far-reaching educational reforms.⁴ However, as shown in this paper, educational reform can only be a partial solution to the unemployment problem.

² Another typical form of labor market intervention relates to termination restrictions, or firing costs. Many paper have studied the impact of these restrictions, including Lazear (1990), Bentolila and Bertola (1990), Hopenhayn and Rogerson (1993), and Garibaldi (1998).

³ The 2000 Census reported that 90 percent of the unemployed have not completed the high school certificate.

⁴ A common measure of mismatch in the labor market—the variance of relative unemployment rates across categories—suggests that mismatch may have actually declined between the 1990 and 2000 censuses. Using labor market data by educational category, the variance of relative unemployment rates has declined from 17 percent to 12 percent. The intuition for this measure
(continued...)

In the face of strong economic growth, such an increase in unemployment suggests that the root of the problem could lie in Mauritius' labor market institutions. These institutions—which compress the wage distribution and limit the ability of employer's to redeploy their workers—may have seriously impaired the functioning of the labor market. While they may not have resulted in significant unemployment in earlier decades, the increasing importance of (high-wage) service sectors in Mauritius, which have increased the impact of cross-market wage compression, as well as the gradual decline in the demand for low-skill workers, has probably exacerbated the impact of these institutions.

The impact of these restrictions will most likely become increasingly detrimental as Mauritius faces significant structural challenges—considerably changing the market for low-skill workers—in coming years. The most significant of these challenges is the eventual loss of preferential arrangements for its sugar and textile exports. While it is still uncertain when the preferential sugar regime will end, Mauritius' quota under the Agreement on Textiles and Clothing is set to lapse by end-2004. Although the preferential access granted under the U.S. African Growth and Opportunity Act may mitigate some of this impact, the Mauritian economy will undoubtedly go through a period of restructuring, as the textile sector adjusts to its new environment. As discussed in Section II, signs of adjustment are already evident in textiles. Changes in the demand for sugar workers have already begun with the government's Sugar Sector Strategy, which has reduced employment by around a quarter. By delaying the reform of its labor market institutions, Mauritius will exacerbate the pain involved in this adjustment, especially for those with few skills.

In light of these challenges, this paper analyzes the market for low-skill workers, who risk being neglected as the government focuses on developing other sectors. With the export processing zone (EPZ) being an important source of low-skill employment, the paper first investigates the evolution of this sector (in Section II). In Section III, a simple stylized model of the job creation and destruction processes is employed (and calibrated) to assess the potential benefits of labor market reform.

As such, this paper complements the work of McDonald and Yao (2003), who looked at the impact of Mauritius' institutions on the prospects for developing new sectors, and the consequent labor market transition. This paper concentrates on how these institutions affect the prospects for low-skill workers by changing the incentives to create and destroy jobs—in both new as well as existing areas—that they are able to perform. With these workers the most likely to suffer from the structural transformation, deregulation could potentially improve the labor market conditions these workers face in a relatively short space of time.

is that the greater the dispersion in unemployment rates, the greater the mismatch in the labor market (Layard, Nickell, and Jackman, 1991, Ch. 6).

B. Mauritius's Labor Market Institutions

The Mauritian labor market is highly regulated, with wages and conditions of employment determined centrally rather than at the firm level. The government establishes a separate set of labor market regulations, called Remuneration Orders (RO), for each industry.⁵ These regulations specify the exact duties of every type of worker in the firm in great detail. With these regulations being aggressively enforced by the Ministry of Labor, worker redeployment is extremely difficult. Therefore, wages and conditions do not reflect the productivity or circumstances of individual firms. Moreover, terminations tend to be costly and time consuming, requiring approval of the Termination of Contracts Services Board, and often leading to delays on the order of four months.

The centralized wage determination process tends to compress the wage distribution.

Basic wages for each occupation are set in the RO, with the annual tripartite wage setting process resulting in a new wage for all categories. In most years, this process results in wage growth indexed to inflation, with lower wages rising by more than higher ones. Once every five years, the Pay Research Bureau establishes a catch-up wage increase for the public sector, which typically puts some additional pressure on private sector wages.

The ability of the economy to adjust in the face of its structural challenges will be inhibited by these regulations (see Section III). With wages being compressed and workers unable to be redeployed as circumstances change, jobs become substantially more fragile. Moreover, the incentive to create new jobs can also be reduced significantly. Therefore, even with the government encouraging the creation of new industries, such as the information, communication and technology (ICT) sector, many of these opportunities, at least for some time, may bypass much of Mauritius' low-skill workforce. Employment opportunities for these workers can be enhanced over the medium term by simply liberalizing the regulations that govern the labor market.

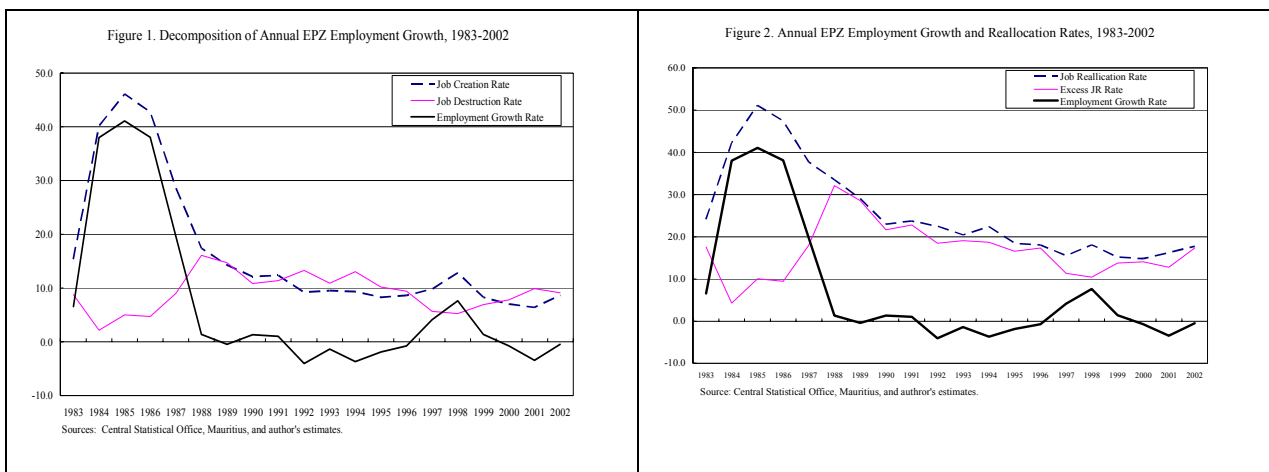
II. EVOLUTION OF EMPLOYMENT IN THE EPZ (TEXTILES) SECTOR⁶

Textile production, especially in the EPZ sector, has contributed significantly to the Mauritian “growth miracle.” Figure 1 shows the decomposition of EPZ employment growth

⁵ For example, the RO for the catering industry defines “assistant barman,” “barman,” and “head barman” as separate occupations with each unable to perform the duties of the other—an “assistant barman” cannot prepare a drink if a “barman” is at the bar. These regulations do not cover the EPZ sector, and are not expected to cover new information, communications, and technology (ICT) activity.

⁶ With textiles accounting for almost 90 percent of EPZ sector employment, textiles and EPZ will be referred to interchangeably in this section.

into its separate components—job creation and job destruction—since 1983.⁷ This figure shows the remarkable transformation that occurred in the early 1980s, before the extent of job creation and destruction stabilized around their longer-term values. This figure also shows that the creation and destruction of jobs is a persistent and continual process of renewal, with sizable job destruction occurring even during periods of high employment growth. This continual creation and destruction suggests substantial “reallocation” of activity across firms within the EPZ sector. Figure 2, which depicts the job reallocation and excess job reallocation rates, shows that the exceptional job reallocation seen initially, reflecting the rapid creation of new EPZ sector jobs during the early 1980s, subsequently declined as the industry matured.⁸ As measured by the excess job reallocation rate, the extent of churning in the labor market also declined as the industry matured.

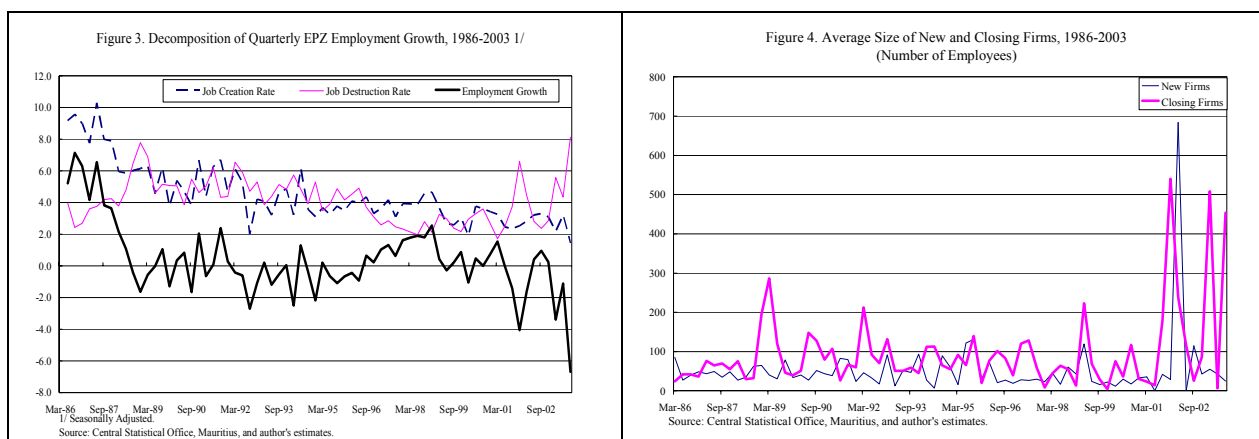


⁷ The job creation, destruction, and employment growth rates used in this section are calculated by dividing the change in employment between two periods by the average employment in those periods. While slightly different from the standard definition of growth rates, it is consistent with the definition typically applied in the job flows literature—see Davis, Haltiwanger and Schuh (1997).

⁸ Following Davis, Haltiwanger and Schuh (1997), the job reallocation rate is defined as the sum of job creation and destruction rates. This definition reflects the fact that reallocation of jobs and workers from one type of activity to another typically requires the creation of jobs at expanding enterprises and destruction of jobs at contracting ones. Defined in this way, job reallocation also equals the maximal reallocation of workers induced by the reshuffling of employment opportunities across enterprises. The excess job reallocation rate is defined as job reallocation in excess of absolute employment growth, indicating the reallocation of jobs above the amount required to accommodate net employment changes, and may be also thought of as a measure of “churning.”

Quarterly job creation and destruction data show signs of a weakening in textiles during 2003. Figure 3 shows the quarterly decomposition of employment growth (from March 1986 to September 2003), and is analogous to Figure 1. This figure also shows the rapid growth in EPZ employment in the mid-1980s, before a moderation in employment growth throughout the 1990s. However, the data for the first three quarters of 2003 show a substantial decline in the rate of job creation (to its lowest level ever), and a rapid increase in the rate of job destruction. In addition, Figure 4 shows a marked increase in the average size of firms closing down in the last two years. Although relatively recent, the dramatic nature of the increase in job destruction and decline in job creation in the last year would be consistent with a rapid structural decline in Mauritian textiles. While the industry is unlikely to—even in the long-run—disappear, it could very well be much smaller in the coming years.

Mauritius' restrictive labor market institutions mean that it shares many characteristics with other highly regulated labor markets, such as those in western Europe. In addition to Mauritius' relatively high unemployment, unemployed workers face exceptionally long spells, with an average (median) unemployment duration of 20 (9) months. Moreover, consistent with the stagnant nature of the unemployment pool, Mauritius has relatively low rates of job flows. Table 1 compares the rates of job creation and destruction in the United States, Portuguese manufacturing, and the Mauritian EPZ sector (which is predominantly textiles). The Mauritian and Portuguese labor markets tend to exhibit much smaller quarterly job flows than seen in the United States, suggesting they are less dynamic than the relatively unregulated U.S. one. That is, flows of workers into and out of unemployment seem less frequent, thereby leaving the unemployed stranded for longer.



III. AN ASSESSMENT OF THE IMPACT OF WAGE SETTING AND REDEPLOYMENT RESTRICTIONS

This section investigates the impact of labor market institutions that compress wages and inhibit the redeployment of workers by using a calibrated equilibrium labor market model. It finds that even relatively small distortions can substantially affect the nature and incidence of unemployment. The model used in this section is specifically chosen to highlight the effect of institutions on the creation and destruction of jobs, and ultimately unemployment.

It is also a fairly standard labor market model, being similar to that developed by Pissarides (2000) and Mortensen and Pissarides (1994). An important advantage of this type of model is that it explicitly captures the frictional nature of labor markets.

Table 1. Quarterly Job Flows Rates

Country	Sector	Job Creation	Job Destruction
United States		1972(2)-1993(4)	
	Manufacturing	5.07	5.47
	Apparel and Textiles	4.58	5.40
Portugal		1991(1)-1995(4)	
	Manufacturing	3.20	3.90
	Portugal/U.S. 1/	0.63	0.71
Mauritius		1989(1)-2003(1)	
	EPZ	3.96	4.02
	Mauritius/U.S. 2/	0.86	0.74

Sources: United States: Davis, *et. al.*, *Job Creation and Job Destruction*, 1997, MIT Press.

Portugal: Blanchard, O. and P. Portugal, "What Hides Behind the Unemployment Rate," *American Economic Review*, March, 2001.

Mauritius: Central Statistical Office, Mauritius and author's estimates.

1/ Compared with U.S. manufacturing sector.

2/ Compared with U.S. apparel and textile sectors.

A. Model Environment and Equilibrium

In the model economy assumed here, a large number of entrepreneurs can create job openings. Once created, the entrepreneur searches for a worker to fill the position which, depending on the extent of frictions in the market, may be very difficult and time consuming. When a worker and an entrepreneur meet, they, if allowed, bargain over the wage and decide whether to work together, thereby creating a job. However, if the government legally imposes the wage to be paid, production only occurs if profitable at that given wage. The profitability of these jobs evolve in a persistent manner, reflecting changes in demand and technology. If, as a result of this evolution, the job becomes unprofitable, the entrepreneur will destroy it and possibly create a new job opening, while the worker becomes unemployed and is able to search again.

Entrepreneurs are assumed to be risk neutral, and value consumption, but suffer disutility of k for each vacancy they post.⁹ That is, assuming they discount the future by a factor $\beta \in (0,1)$, their lifetime preferences may be represented as $\sum_{t=0}^{\infty} \beta^t (c_t - kv_t)$.

⁹ This assumption is made without loss of generality, and can be shown to be equivalent to assuming that there is a resource cost to posting vacancies.

An entrepreneur will attempt to create a job by posting a vacancy whenever it is profitable to do so. This means that the equilibrium number of vacancies posted is determined by a zero profit condition

$$(1) \quad -k + \beta q(\cdot)J(\bar{\varepsilon}) = 0, \text{ whenever } v > 0, \text{ and}$$

where k is the cost of posting the vacancy, $q(\cdot)$ is the (endogenous) rate at which entrepreneurs meet searching workers, and $J(\varepsilon)$ is the value received by the entrepreneur from being matched with a worker. As mentioned above, these jobs are subject to idiosyncratic uncertainty—represented by the job's productivity level ε —which makes its value change from period to period. However, for analytical convenience, and without any real loss of generality, all new matches are assumed to begin with the highest value of $\bar{\varepsilon}$. The value of each match must satisfy the following Bellman equation:

$$(2) \quad J(\varepsilon) = f(\varepsilon) - w(\varepsilon) + \beta(1 - \gamma)J(\varepsilon) + \beta\gamma E \max\{J(\varepsilon'), 0\},$$

where $f(\varepsilon)$ is the output generated by the match, $w(\varepsilon)$ is the negotiated wage, and γ is the probability that the job will be subject to a change in its output. If the value of continuing with the worker in this job falls below zero, the match is destroyed. The shock, ε , is drawn from a distribution, $F(\varepsilon)$.¹⁰

Workers are also assumed to be risk neutral, caring only about their consumption, and discounting the future by the factor $\beta \in (0, 1)$. That is, a worker's life-time utility is represented by $\sum_{t=0}^{\infty} \beta^t c_t$. Therefore, the value of working enjoyed by an employed worker ($V^e(\varepsilon)$) is given by a Bellman equation analogous to (2)

$$V^e(\varepsilon) = w(\varepsilon) + \beta(1 - \gamma)V^e(\varepsilon) + \beta\gamma E \max\{V^e(\varepsilon'), 0\},$$

where $w(\varepsilon)$ is the wage paid to the worker. The $E \max$ operator reflects the fact that the wage bargaining process results in a wage so that worker and entrepreneur will always agree on whether the match should continue or be destroyed. An unemployed worker receives a value equal to the expected discounted value of finding a job with probability $p(\cdot)$, so that

$$V^u = \beta[p(\cdot)V^e(\varepsilon) + (1 - p(\cdot))V^u],$$

where $p(\cdot)$ is the (endogenous) probability that an unemployed worker receives a job offer.

The costly and time consuming matching process is represented in a very stylized way, with the number of jobs formed in any period being a function of the number of vacancies and unemployed workers, $m(u, v)$. As is common in the labor market matching literature, we assume this is a constant returns-to-scale function, meaning the job- and worker-finding rates

¹⁰ Although somewhat non-standard, the process for idiosyncratic productivity defines a persistent stochastic process.

only depend on the tightness of the labor market—the ratio of vacancies to searching workers.

Given this, the finding rates can be represented by: $p\left(\frac{v}{u}\right) = \frac{m(u,v)}{u}$, and $q\left(\frac{v}{u}\right) = \frac{m(u,v)}{v}$.

Finally, steady state unemployment is given by $u^* = \frac{\delta^*}{p(\cdot) + \delta^*}$, where δ^* is the steady state measure of jobs endogenously destroyed.

Having described the basic elements of the model, **we now derive the conditions underlying the steady state equilibrium of the model**: first in the case when firms and workers are free to bargain, and then when the government artificially compresses the wages paid. In this simple model, two decision rules are sufficient to characterize the job creation (determining the extent of labor market tightness, $\frac{v}{u}$) and destruction (determining the threshold idiosyncratic productivity, ε_d) decisions in equilibrium.

Wage Determination: Decentralized Bargaining

In the case where firms and workers are free to bargain, the bargain process is assumed to satisfy the Nash axiomatic solution, which results in wages sufficient to compensate the worker for their value for searching plus a share—equal to their bargaining power, θ —of the “surplus” generated by the match ($S(\varepsilon)$), i.e., $V^e(\varepsilon) = V^u + \theta S(\varepsilon) = V^u + \theta [J(\varepsilon) + V^e(\varepsilon) - V^u]$. It is easy to show that for linear production functions, the equilibrium wage function ($w(\varepsilon)$) will be linear in productivity: $w(\varepsilon) = w_0 + w_1 \varepsilon$ (see Pissarides, 2000, Chap. 2). The endogenous equilibrium creation and destruction decisions can be neatly summarized by two elements: the reservation productivity below which the match is destroyed (ε_d); and the extent of labor market

tightness—defined as the ratio of vacancies to the number of unemployed ($\frac{v}{u}$). In this case, the

equilibrium creation and destruction decision rules ($\frac{v^*}{u}$ and ε_d) satisfy (3) and (4),

$$(3) \quad q\left(\frac{v^*}{u}\right) = \frac{k}{\beta(1-\theta)S(\bar{\varepsilon})}, \text{ and}$$

$$(4) \quad S(\varepsilon_d) = f(\varepsilon_d) + \beta(1-\gamma)S(\varepsilon_d) + \beta\gamma E \max\{S(\varepsilon'), 0\} - \beta p \theta S(\bar{\varepsilon}) = 0, \text{ respectively.}$$

One attractive property of this equilibrium relates to the efficiency of the equilibrium allocation. As shown by Hosios (1990), given the extent of matching frictions, the equilibrium is efficient when the elasticity of the matching function with respect to unemployment equals θ . We will return to this property in the calibration of the model, which will be calibrated so that the decentralized bargaining equilibrium is efficient. Therefore, the resulting impact of labor market institutions will be deviations from the efficient allocation.

Wage Determination: Exogenous Wage Schedule

In the case where the government imposes a (compressed) wage schedule, $\tilde{w}(\varepsilon)$, the value derived by an entrepreneur from being matched, (2), is modified to become

$$(5) \quad \tilde{J}(\varepsilon) = f(\varepsilon) - \tilde{w}(\varepsilon) + \beta(1 - \gamma)\tilde{J}(\varepsilon) + \beta\gamma E \max\{\tilde{J}(\varepsilon'), 0\}.$$

The resulting equilibrium creation and destruction decision rules satisfy the following equations,

$$(6) \quad q\left(\frac{\tilde{v}^*}{u}\right) = \frac{k}{\beta\tilde{J}(\bar{\varepsilon})}, \text{ and}$$

$$(7) \quad \tilde{J}(\varepsilon_d) = f(\varepsilon_d) - \tilde{w}(\varepsilon_d) + \beta(1 - \gamma)\tilde{J}(\varepsilon_d) + \beta\gamma E \max\{\tilde{J}(\varepsilon'), 0\} = 0, \text{ respectively.}$$

The solution of this model with exogenous wages may be represented in a simple diagram. The equilibrium decisions relating to job creation (JC) and destruction (JD) can then be

summarized in Figure 5, which represent feasible combinations of ε_d and $\frac{v}{u}$ that are

consistent with the optimal creation and destruction of jobs. The intuition for the negative relation between the “decision rules” that underlie the JC relation reflects the fact that an increase in the tightness of the labor market leads to an increase in the expected cost of creating a new job—by reducing the chance a vacant position will be filled this period—meaning that existing jobs will be more durable and, therefore, less productive jobs will survive. When the wage is set by the government, the reservation productivity underlying the amount of job destruction is independent of the tightness of the labor market, and hence results in a vertical JD curve.¹¹

The simple nature of this stylized model means that the impact of policies and institutions can easily be studied. For the questions considered in this section, two comparative statics are relevant: (i) the impact of an exogenous compression in the wages relative to the results of bargaining; and (ii) the impact of limits on the ability to redeploy workers. The wage compression assumed in this paper reflects both some cross-market compression, as well as

¹¹ This differs from the solution in the standard Mortensen and Pissarides (1994) model where wages are bargained. In that model, there is a negative relation underlying the JD curve, which reflects that a tighter labor market (higher $\frac{v}{u}$) increases workers’ bargaining power—and hence their wages—meaning that more marginal jobs will become unprofitable and hence will be destroyed.

some within-market compression. More specifically, the nature of wage compression is assumed to be such that, *for a constant distribution of productivity across jobs*, average wages are g percent higher than they would be if bargained, and the slope of the wage schedule becomes flatter by a factor ϕ ($g = 0$ means no cross-market compression, and $\phi = 1$ means no within-market compression).¹² For the second comparative static, we assume that the notion of redeployment restrictions can be captured by lower average per period output from the worker.¹³

The qualitative **impact of wage compression** on the creation and destruction decisions of firms is clearly shown in Figure 5(a). First, raising the average wage paid to low-skill workers, especially the wages of the lowest paid, makes the most “marginal” jobs unprofitable, resulting in their destruction. Therefore, the productivity of the marginal job, ε_d , must rise, increasing the total amount of destruction (the JD curve moves right). There is a slightly offsetting effect on job creation. Since all new jobs are assumed to begin with high productivity in this model, and as relative wage compression reduces the relative wage paid in higher wage jobs, the incentive to create new jobs (at the same time as destroy old jobs) rises slightly (the JC curve moves right). In aggregate, more jobs are destroyed, and fewer jobs are typically created.

The **impact of restrictions on the flexibility of workers** has very intuitive effects, which are shown in Figure 5(b). By reducing the expected output of a worker in any given period, keeping workers in more marginal jobs is no longer profitable (and so the JD curve moves right).¹⁴

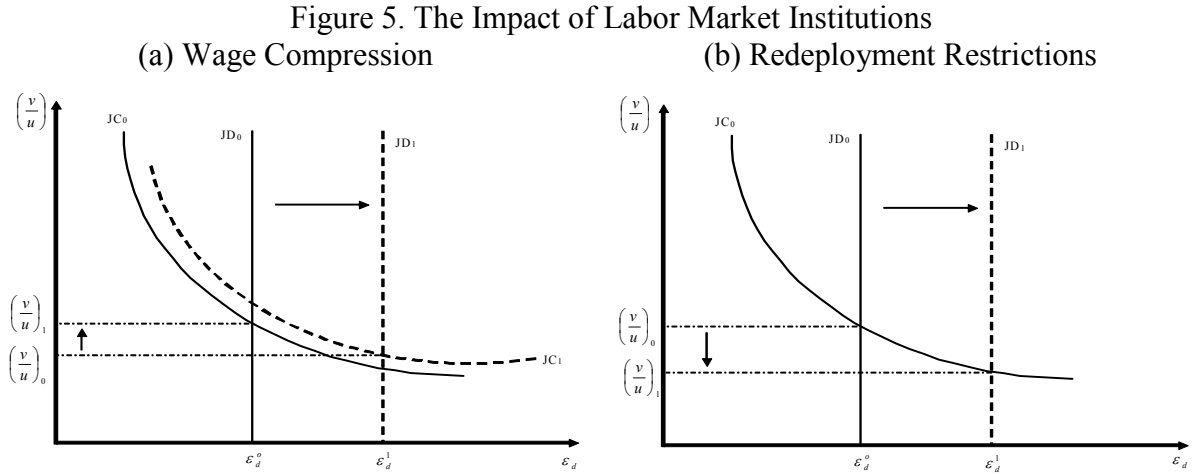
¹² This can be accomplished by a compressed wage schedule of the form $\tilde{w}(\varepsilon) = \tilde{w}_0 + \tilde{w}_1 \varepsilon$, where $\tilde{w}_1 = \phi w_1$ and $\tilde{w}_0(\varepsilon) = w_0(1 + g) + w_1(1 - \phi + g)E(w(\varepsilon))$. Using (6) and (7) one can formally derive that $\left. \frac{\partial \varepsilon_d}{\partial g} \right|_{JD} > 0$, and $\left. \frac{\partial w(\varepsilon_d)}{\partial \phi} \right|_{JD} < 0$, meaning $\left. \frac{\partial \varepsilon_d}{\partial \phi} \right|_{JD} < 0$. Other things equal, $\left. \frac{\partial \varepsilon_d}{\partial \phi} \right|_{JC} > 0$ and $\left. \frac{\partial \varepsilon_d}{\partial g} \right|_{JC} = 0$, although job creation is affected in the latter case though the rise in job destruction.

¹³ Since the ability of firms to redeploy workers reduces the value a firm can expect from a worker in any period, it is modeled as a reduction in the level of output expected in any period. That is, with some probability a worker may need to perform the duties of another occupational category. Since employment restrictions inhibit this re-deployment, the worker is less valuable.

¹⁴ Assuming that $f(\varepsilon) = \hat{\varepsilon} + \varepsilon$, and using (6) and (7), one can derive the following comparative statics for a change in $\hat{\varepsilon}$: $\left. \frac{\partial \varepsilon_d}{\partial \hat{\varepsilon}} \right|_{JD} < 0$, and $\left. \frac{\partial \varepsilon_d}{\partial \hat{\varepsilon}} \right|_{JC} = 0$.

Reflecting the increasing fragility of jobs, the destruction of jobs increases, as does—indirectly—the creation of new jobs.¹⁵

These effects are quite general and apply both beyond the EPZ sector as well as the Mauritian labor market. In particular, even if some sectors are granted a preferential regulatory environment, the opportunities for low-skill workers will still be unnecessarily restricted. Indeed, as the structure of the economy and the demand for low-skill workers changes over the coming years, the differential regulatory treatment could become increasingly detrimental.



B. Calibration

To make this analysis more concrete, this **stylized model of job creation and destruction is calibrated to salient features of the Mauritian economy**. This involves choosing values for all of the model's parameters, and a functional form for the matching function. First, we take a model period to be a quarter, therefore setting the discount factor to $\beta = 0.99$.¹⁶ Following much of the matching and job flows literature, we choose a Cobb-Douglas form for the matching function. Several empirical studies have estimated the elasticity of the matching

¹⁵ In this context, the fragility of a job refers to the likelihood it is destroyed. By *relative wage compression* we mean that—possibly due to centralized wage determination—the wages paid to workers are artificially more similar than they would be if wages were the result of firm-level bargaining (Bertola and Rogerson, 1997). This means that differential wages do not fully reflect differences in productivity or working conditions. More specifically, this could mean that wages in a particular sector are “linked” to wages in a higher paying sector (cross-market compression), and/or that wages within an industry are closer to each other, although the average wage is much the same (within-market compression). Invariably, both of these types of compression occur together.

¹⁶ This is consistent with an annual discount rate of 4 percent.

function with respect to unemployment, α , and found that estimates in the range of 0.4-0.7 (Petrongolo and Pissarides, 2001). For the purposes of this exercise the—relatively conservative—lower estimate of $\alpha = 0.4$ is chosen. In the undistorted equilibrium, where firms and workers bargain over the wage, the bargaining power of the worker is assumed to be consistent with an efficient equilibrium allocation. That is, following Hosios (1990), we set $\theta = \alpha = 0.4$. We also assume that idiosyncratic productivity, ε , is distributed uniformly.

The remaining parameters, k and γ are chosen to match the average EPZ job destruction rate following the establishment of the sector (of 4.02 percent during 1989-2002), and the unemployment rate for low-skill workers recorded in the 2000 census (of 9.6 percent).¹⁷ Finally, the parameter governing the efficiency of the matching process is chosen so that a reasonable degree of labor market tightness—two-thirds—would result in a decentralized bargaining market. The final choice we need to make is the extent of wage compression in the economy. While Mauritius' labor market institutions undoubtedly compress wages, there is unfortunately no concrete measure of the degree of this compression in Mauritius.¹⁸ In the baseline calibration, we—conservatively—assume a small amount of “bleeding” of wages from high-wage sectors to low-wage workers ($g = 0.02$), as well as some moderate compression of wages paid within low skill industries consistent with the cross-market effect ($\phi = 0.5$). The benchmark model results (with matched unemployment and job destruction rates) are reported at the top of Table 2.

C. Empirical Results

Even assuming relatively minimal wage compression, there is a noticeable impact on unemployment, the average length of an unemployment spell, and—although to a lesser extent—unit labor costs. All of the policy experiments are performed relative to an environment where firm-level wage bargaining is the norm. Table 2 reveals a significant increase in unemployment, as well as the average length of unemployment spells. These changes reflect a significant reduction in the creation of new jobs—evidenced by the 20 percent jump in the job finding rate when compression is removed—and an increase in job fragility—seen in the rate of job destruction. Even small amounts of wage compression can, therefore, lead to a significant reduction in the welfare of workers (and employers). A move to firm-level wage bargaining could bring significant benefits to these workers. While wage compression also tends to increase unit labor costs, it has a relatively minor impact because wage compression leads to the closure of the less productive jobs, raising average productivity.

¹⁷ It is implicitly assumed that all low-skill jobs share the job destruction rate of the EPZ sector. In 2000, the overall unemployment rate was 8.8 percent.

¹⁸ For example, Mauritius does not have estimates of traditional measures of wage dispersion, such as the 90-10 wage differential, or the cross-sectional variance of wages paid.

Table 2. Model Output: The Impact of Labor Market Restrictions

	Unemployment Rate	Unemployment Duration (mths)	Job Finding Rate	Job Destruction Rate	Unit Labor Costs	Excess Job Reallocation
Baseline Results						
<i>Benchmark 1/</i>	9.6	11.5	37.8	4.0	0.89	8.0
<i>No Wage Compression</i>	7.4	9.5	45.4	3.6	0.88	7.2
% Difference	-23.2	-16.8	20.2	-10.0	-0.6	-9.9
Wage Compression						
No Cross-Market Comp.	7.7	9.3	46.7	3.9	0.87	7.8
% Difference 2/	4.3	-2.7	2.8	7.7	-1.0	7.7
No Within-Market Comp.	9.5	12.0	36.1	3.8	0.89	7.6
% Difference 2/	28.6	25.7	-20.4	4.7	1.5	4.7
Redeployment Restrictions						
<i>No Wage Compression</i>						
10% lower redeployment rate	7.7	9.9	43.8	3.7	0.88	7.3
% Difference 2/	4.1	3.7	-3.5	0.8	-0.5	0.7
<i>Wage Compression</i>						
10% lower redeployment rate	9.9	11.8	36.7	4.0	0.88	8.1
% Difference 2/	34.2	23.7	-19.2	11.6	0.1	11.6
% Difference No Wage Comp.	29.0	19.4	-16.2	10.7	0.6	10.8

1/ Assumes some cross-market ($g = 0.02$) and within-market ($\phi=0.5$) wage compression.

2/ Difference from “No Wage Compression” simulation.

While both types of wage compression are costly, cross-market compression seems more harmful. Removing the cross-market compression leads to a much larger reduction in unemployment, than removing the within-market compression. Reflecting its immediate effect on profitability, removing the cross-market compression leads to a big increase in the rate of job creation, and a small reduction in the job destruction. Removing the assumed amount of within-market compression has a smaller effect on the creation of new jobs, but leads to a bigger fall in the fragility of existing jobs as it has a bigger impact on the profitability of the most marginal jobs.

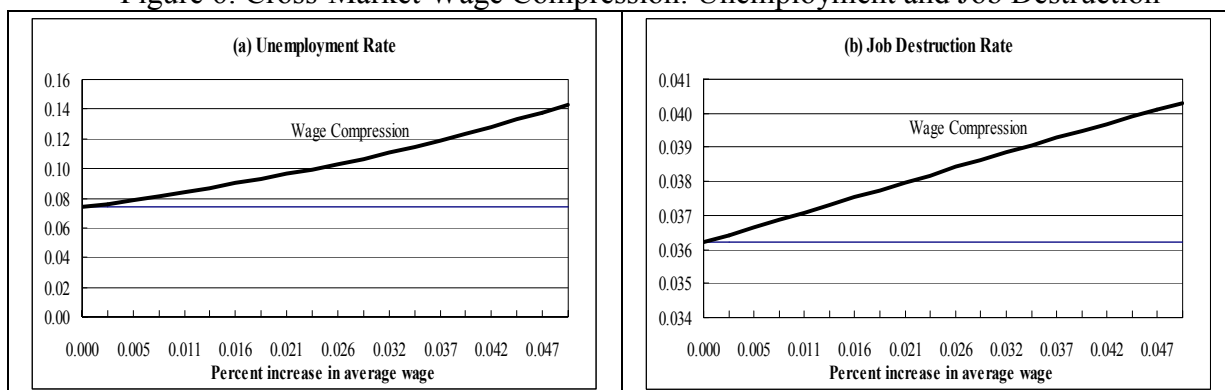
A small reduction in the ability of firms to redeploy workers also leads to an increase in unemployment, and the length of average unemployment spells. In this exercise, it is assumed that such regulations result in a 10 percent reduction in the level of output.¹⁹ The increases in unemployment and unemployment duration reflect increases in the fragility of jobs (an increase in job destruction), as well as a lower job finding rate given the fall in profitability. Table 2 also shows that wage compression significantly worsens the impact of these employment restrictions, with these restrictions resulting in a 4.1 percent rise in unemployment in the absence of wage setting restrictions, and a 34.2 percent rise in unemployment with such restrictions.

¹⁹ As discussed above (in Section III A, and especially footnote 12) the impact of redeployment restrictions is modeled as a reduction in the expected product of a worker in any period.

Figures 6–8 show the **consequences of various degrees of wage compression and employment restrictions for labor market outcomes**, as we move from an undistorted equilibrium in which firms and workers are free to bargain over wages. Figure 6 shows the impact of cross-market compression up to a 5 percent increase in average wages. Figure 7 shows the impact of increasing within-market wage compression so that average wages remain relatively unchanged. Figure 8 shows the effect of reducing the difficulty of redeploying workers, as reflected in an increase in expected output.

- Increases in the extent of *cross-market* wage compression lead to monotonic increases in unemployment and the fragility of jobs. Although not shown, they also increase the length of the average unemployment spell and the extent of inefficient churning.
- Increases in the extent of *within-market* wage compression tend to increase unemployment and the fragility of jobs. There is also an increase in the extent of inefficient churning, and the average duration of each job falls by over 10 percent. For very high amounts of wage compression, there is a slight reduction in unemployment reflecting the fact that—given the assumption that new jobs are created with the highest level of productivity—higher within-market wages tend to increase the job finding rate.
- Increases in *ability to redeploy* workers significantly reduce unemployment and job fragility. Although not shown, the average length of unemployment spells and the extent of inefficient churning also fall. Moreover, all these improvements are greater when wages are not compressed.

Figure 6: Cross-Market Wage Compression: Unemployment and Job Destruction



Wage compression significantly worsens the impact of negative shocks. As can be seen from Table 2, the impact of a 10 percent reduction in the level of output significantly increases the extent of unemployment and the length of unemployment spells. With the main employers of low-skill workers undergoing significant changes in coming years, reform to these wage setting institutions will become increasingly important.

Figure 7: Within-Market Wage Compression: Unemployment and Job Destruction

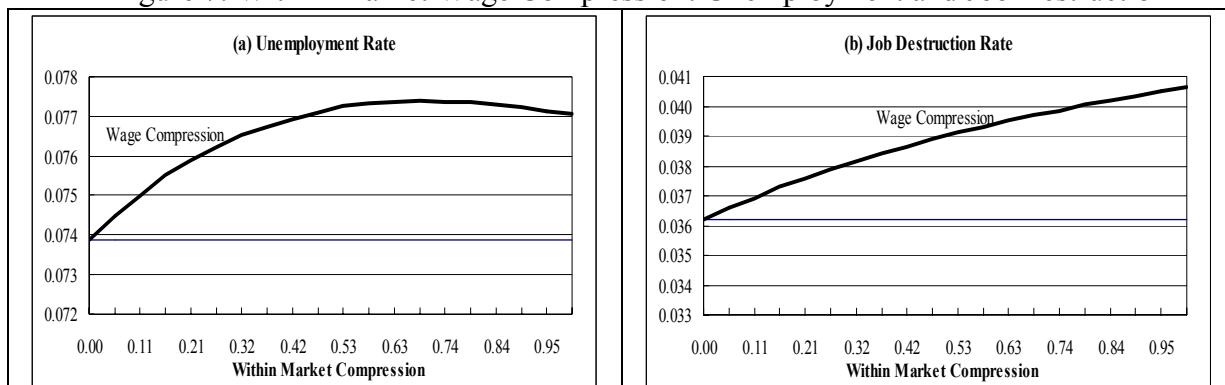
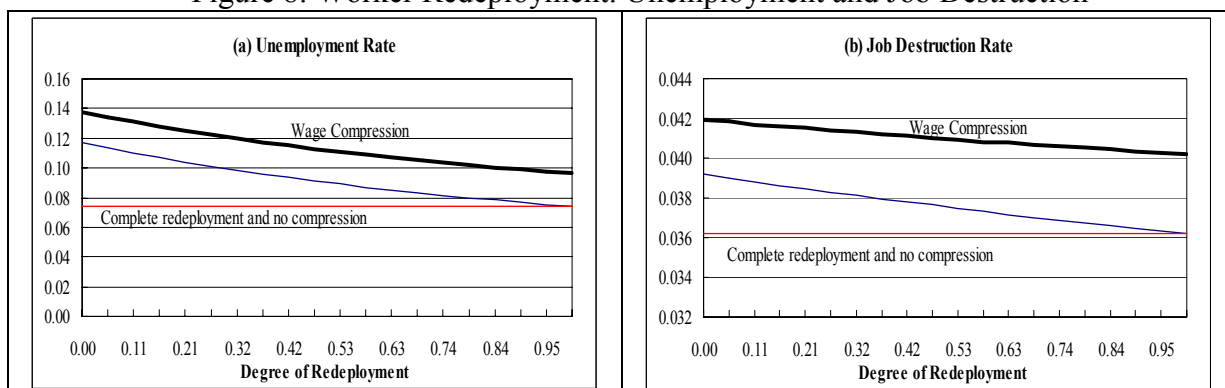


Figure 8: Worker Redeployment: Unemployment and Job Destruction



IV. CONCLUSION

Sectors that intensively employ low-skill workers, such as sugar and EPZ, have contributed significantly to the Mauritian “growth miracle” (Subramanian and Roy, 2001). The rapid economic transformation that resulted from the EPZ sector creation is clearly seen in Figures 1 and 2. However, in the face of impending changes in these markets, low-skill workers will face very different employment prospects in the coming years. Indeed, the evidence presented in Section II suggests these changes, at least for textile workers, have already begun. Therefore, the need for labor market reform is now urgent.

While several factors have contributed to the incidence of unemployment in Mauritius, the results of a simple modeling exercise show that even minimal wage compression and redeployment restrictions reduce the employment of the affected workers and increase the length of the resulting unemployment spells. Moreover, all of these policies result in excessive turnover in the economy, which will ultimately reduce the ability of workers to acquire skills when employed and hasten their atrophy when workers become unemployed. Indeed, the harm resulting from any of these distortions is intensified when other distortions coexist. Moreover, wage compression imposes costs beyond those discussed in this paper. As Haltiwanger and Vodopivec (2002, p. 5) find in their study on Slovenia, “... businesses with

more compressed wages have ... greater excess turnover for high quality workers, ... [and] wage compression creates excessive instability of jobs and imposes additional worker dislocation costs, as well as reduces firms' ability to achieve quality firm-worker matches." As discussed above, institutions that compress wages are found in many countries.

Shielding some sectors from restrictive institutions may ameliorate the effects temporarily, but ultimately these distortions will harm the opportunities for low-skill workers and, more broadly, longer-term growth prospects. By distorting the incentives to reallocate economic activity into new, unimagined, areas, these institutions limit the opportunities for low-skill workers and inhibit the reshaping of the economy. This will become increasingly so, as the economy undergoes an enforced structural transformation in the coming years.

Although education is often seen as a solution to poor labor market outcomes in many countries, ignoring institutions that inhibit the demand for labor can have significant consequences. While the Mauritian government has embarked on a bold and necessary series of educational reforms, general labor market reform remains crucial. These educational reforms will undoubtedly help Mauritius move into other high-tech fields, but will not be able to assist all low-skill workers. First, these educational reforms will take some time to bear fruit. Second, with only 7.3 percent of Mauritians having their higher school certificate, it will take considerable time before these new endeavors can absorb much of Mauritius' low-skill labor force. Therefore, as in many countries, educational reform can, at most, be only a partial solution to unemployment problems.

REFERENCES

- Bentolila, S. and G. Bertola, 1990, "Firing Costs and Labor Demand: How Bad is Eurosclerosis?," *Review of Economic Studies*, Vol. 57, pp. 381-402.
- Bertola, Giuseppe, and Richard Rogerson, 1997, "Institutions and Labor Reallocation," *European Economic Review*, Vol. 41, pp. 1147-71.
- Blanchard, O., and P. Portugal, 2001, "What Lies Behind the Unemployment Rate: Comparing Portuguese and U.S. Labor Markets," *American Economic Review*, Vol. 91 (March), pp. 187-207.
- Davis, Steven J., John C. Haltiwanger, and Scott Schuh, 1997, *Job Creation and Destruction* (Cambridge: MIT Press).
- Garibaldi, Pietro, 1998, "Job Flow Dynamics and Firing Restrictions," *European Economic Review*, Vol. 42, pp. 245-75.
- Haltiwanger, John C., and Milan Vodopivec, 2002, "Worker Flows, Job Flows and Firm Wage Policies: An Analysis of Slovenia," IZA Discussion Paper No. 569 (September).
- Hopenhayn, Hugo and Richard Rogerson, 1993, "Job Turnover and Policy Evaluation: A General Equilibrium Analysis," *Journal of Political Economy*, Vol. 101, pp. 915-938.
- Hosios, Arthur, J., 1990, "On the Efficiency of Matching and Related Models of Search and Unemployment," *Review of Economic Studies*, Vol. 57 (April), pp. 279-98.
- Layard, Richard, Stephen Nickell, and Richard Jackman, 1991, *Unemployment: Macroeconomic Performance and the Labour Market* (New York: Oxford University Press).
- Lazear, Edward, P., 1990, "Job Security Provisions and Employment," *Quarterly Journal of Economics*, Vol. 105, pp. 699-726.
- McDonald, Calvin, and James Yao, 2003, "Mauritius: Unemployment and the Role of Institutions," IMF Working Paper 03/211 (Washington: International Monetary Fund).
- Mortensen, Dale T., and Christopher A. Pissarides, 1994, "Job Creation and Job Destruction in the Theory of Unemployment," *Review of Economic Studies*, Vol. 61 (July), pp. 397-415.
- OECD, 1994, *Employment Outlook 1994* (Paris: OECD).
- OECD, 1995, *The OECD Jobs Study* (Paris: OECD).

- Petrongolo, Barbara, and Christopher A. Pissarides, 2001, "Looking into the Black Box: A Survey of the Matching Function," *Journal of Economic Literature*, Vol. 39 (June), pp. 390-431.
- Pissarides, Christopher A., 2000, *Equilibrium Unemployment Theory* (Cambridge: MIT Press, 2nd ed.).
- Subramanian, Arvind, and Devesh Roy, 2001, "Who Can Explain the Mauritian Miracle: Meade, Romer, Sachs, or Rodrick?," IMF Working Paper 01/116 (Washington: International Monetary Fund).
- Svejnar, Jan, 1999, "Labor Markets in the Transitional Central and East European Economies," in *Handbook of Labor Economics*, Vol. 3B, ed. by Orley Ashenfelter and David Card (Amsterdam: Elsevier).