



# Job-search and foreign capital inflow – A two sector general equilibrium analysis<sup>☆</sup>

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## ABSTRACT

The purpose of this paper is to extend the Fields' (1989) multi sector job-search model by introducing international trade and capital. Two types of capital are considered: fixed capital and mobile capital. The effects of search intensity and the inflow of foreign capital on the volume and the rate of urban unemployment and on the social welfare are also examined in both of the two cases. The main finding is: more efficient on-the-job search from the rural sector raises unemployment rate when capital is mobile between the two sectors. This is counterproductive to the standard result.

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## 1. Introduction

Job search is an integral part of the labor market. The idea of job search was first introduced by [Burdett and Mortensen \(1978\)](#). Originally, the search theory was formulated to analyze unemployment. The idea of job search has been incorporated in the models of [McCall \(1970\)](#), [Fields \(1975, 1989\)](#), [Majumder \(1975\)](#), [Stark \(1982\)](#), [Adam and Cletus \(1995\)](#), [Postel-Vinay and Robin \(2002\)](#), [Dolado et al. \(2009\)](#), [Hussey \(2005\)](#), [Sheng and Xu \(2007\)](#), [Flinn and Mabli \(2008\)](#), [Arseneau and Chugh \(2009\)](#), [Macit \(2010\)](#).

[McCall \(1970\)](#) used the job search theory as a standard tool for analyzing the decision making process of a jobseeker. [Fields \(1975\)](#) considers three types of job-search: job search from the agricultural sector, job search from the urban informal sector and full-time job search. [Fields \(1989\)](#) extends his earlier model to distinguish between ex-ante job search and ex-post employment. [Stark \(1982\)](#) explains job search in a two period planning horizon where search technologies are not sector independent. [Adam and Cletus \(1995\)](#) present a simple model of job-search where an unemployed worker receives job offer, but he

takes decision on whether to accept this offer based on a set of criteria. [Postel-Vinay and Robin \(2002\)](#) explain wage increase in terms of job search and bargaining theory. [Dolado et al. \(2009\)](#) consider a matching model with heterogeneous jobs and workers which allows for on-the-job search by mismatched workers. [Hussey \(2005\)](#) develops a general equilibrium business cycle model with on-the-job search and wage rigidity arising from long term labor contract. [Sheng and Xu \(2007\)](#) develop a simple two sector search model to examine the impact of the terms of trade (TOT) shocks on unemployment and they show that an improvement of TOT reduces unemployment. [Flinn and Mabli \(2008\)](#) analyze the impact of binding minimum wage on labor market outcomes and welfare in a partial equilibrium model of matching and bargaining in the presence of on-the-job search. [Arseneau and Chugh \(2009\)](#) introduce general equilibrium efficiency in the standard labor search and matching framework. [Macit \(2010\)](#) develops a New Keynesian model in search and matching structure with firing costs and he shows how labor market institutions affect the wage and inflation dynamics.

Another important concept in job search is the 'graduation theory', according to which, it is beneficial to remain in the urban informal sector<sup>1</sup> and search part time for a highly paid job in the urban formal sector.

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<sup>1</sup> The ILO/UNDP employment mission report on Kenya ([International Labour Organisation, 1972](#)) suggested some characteristics of the informal sector as easy entry, reliance on indigenous resources, family ownership of enterprises, small scale of operation, low productivity, labor intensive technology, unregulated market, lack of government support etc.

However, this theory fails in the following circumstances: if the urban formal sector directly recruits from the rural sector (see Majumder, 1975), if urban informal sector workers prefer self employment to an urban formal sector job (see Squire, 1981) or if urban informal sector workers think of an urban informal sector job as a permanent source of income (see Sethuraman, 1981). Moreover, most of the theoretical models on the graduation theory adopts partial equilibrium analysis. Yet there are many factors, such as an imbalance of supply and demand in the analysis of the development of a Less Developed Country (LDC), intersectoral linkages etc., that partial equilibrium analysis cannot address. So, it is desirable to conduct a more general equilibrium analysis of job-search in order to highlight the process of job searching.

This paper builds on the two-sector labor market model of Fields (1975, 1989), by introducing capital and international trade into Fields' framework. Fields (1989) argues that distinguishing between ex-ante and ex-post allocation of the labor force is important for understanding the effects on the unemployment rate. He finds that as long as rural migrants have a positive probability of finding a job in the urban sector, ex-ante and ex-post labor forces will differ, affecting the unemployment rate. In particular, Fields (1989) argues that in this setup, "given a constant agricultural wage, a more efficient on-the-job search from agriculture lowers the urban unemployment rate in equilibrium". However, unlike Fields (1989), we assume a flexible and market determined rural sector wage. The present paper examines the role of search intensity and the inflow of foreign capital on unemployment and on social welfare. In particular, it attempts to show that in a job-search model for a small open economy with two factors of production, labor and capital, some of the results obtained in Fields get altered dramatically if capital is mobile across the sectors.

## 2. The model

The paper builds a two-sector job-search model for a small open economy. The two sectors are the rural sector (sector 1) and the urban sector (sector 2).  $X_1$  is the export good which is produced in sector 1 and  $X_2$  is the import good, produced in sector 2. The assumption of small open economy gives constant product prices in each sector. In the existing theoretical literature on trade and development the developing countries are considered as capital scarce and abundant in the supply of labor. Naturally, these economies are considered to be the exporters of labor-intensive (agricultural) commodities and importers of capital-intensive manufacturing commodities.

The two sectors use both labor and capital as inputs.<sup>2</sup> The production function of all the sectors are subject to the Law of constant return to scale and diminishing marginal productivity to each input. All the markets are competitive and in the long run equilibrium, product price is matched exactly by the unit cost of production in each sector. Capital is specific to each sector. The rural sector uses domestic capital and the urban sector uses foreign capital. So, we have different rentals on capital in the two sectors.

The urban formal sector's wage rate is institutionally given. Urban unemployment exists in our stylized economy as urban job seekers devote full time for searching urban jobs and all of them do not get high paid urban jobs. The unsuccessful urban job seekers stay in the urban sector being unemployed.

The following notations are used in the model:

- $X_1 =$  level of output produced in sector 1
- $X_2 =$  level of output produced in sector 2
- $a_{ji} =$  amount of the  $j$ th input required to produce one unit of the  $i$ th commodity
- $L^k =$  ex-ante amount of labor in the  $k$ th job-search strategy,  $k = 1, 2$
- $L_i =$  ex-post level of employment in  $i$ th sector

- $P_1 =$  1 (commodity 1 is the numeraire)
- $P_2 =$  world price of commodity 2
- $P_2^* = (1+t)P_2 =$  tariff-inclusive domestic price of commodity 2
- $t =$  ad-valorem rate of tariff
- $W_1 =$  rural wage rate
- $W_2^* =$  exogenously fixed urban wage rate
- $R_1 =$  rate of return on domestic capital
- $R_2 =$  rate of return on foreign capital
- $\rho =$  probability of getting urban jobs
- $\varphi =$  efficiency on-the-job search in the rural sector
- $L =$  total labor endowment in the economy
- $K_D =$  stock of domestic capital in the economy
- $K_F =$  inflow of foreign capital in the economy
- $U =$  level of urban unemployment;
- $\mu =$  rate of urban unemployment
- $D_i =$  domestic demand for the  $i$ th goods
- $M =$  demand for the importable goods
- $Y =$  national income at domestic prices
- $\wedge =$  proportional change.

The general equilibrium structure of the model is as follows.

The competitive profit conditions are given by the price unit cost equality:

$$W_1 a_{l1} + R_1 a_{k1} = 1 \tag{1}$$

$$W_2^* a_{l2} + R_2 a_{k2} = (1+t)P_2 = P_2^* \tag{2}$$

The probability of getting urban formal sector job is:

$$\rho = a_{l2} X_2 / (\varphi L^1 + L^2) \tag{3}$$

where  $(\varphi L^1 + L^2)$  is the total number of job seekers.

It is assumed that each worker searches for urban formal sector jobs, perhaps, because of its highest paying potentials. We consider two different job-search strategies: The first strategy describes full time jobs search as remaining unemployed at the beginning. We find this type of job search in Harris and Todaro (1970), Harberger (1971), Mincer (1976), Gramlich (1976), Stiglitz (1982) and McDonald and Solow (1985) and Fields (1989). If a person, searching full time for urban formal sector jobs, becomes successful, he can earn high urban formal wage with a specific probability of getting urban formal sector job and earns zero, as unemployed if he becomes unsuccessful. The second strategy is to remain in the rural sector and search part time for urban formal sector jobs. In this strategy, the success gives high paid urban formal sector jobs, while failure means to remain in the rural sector and earn rural wage.

In the case of job-search, a person may get job in the sector where he does not stay at the beginning. Thus, the number of ex-ante job searchers differs from the ex-post labor force. For this reason, Fields (1989) distinguishes between the ex-ante allocation of labor among different search strategies and the ex-post allocation of labor among different sectors. Each search strategy has expected income. In equilibrium, the expected income from the two strategies would be equal. Thus, the allocation of labor force among the two strategies is given by:

$$\rho W_2^* = \varphi \rho W_2^* + (1-\varphi \rho) W_1 \tag{4}$$

The number of people searching urban formal sector jobs from the rural sector is  $L^1$ . Out of  $L^1$ ;  $\varphi \rho L^1$  people get employment in the urban formal sector. Thus, the ex-post number of workers in the rural sector is:

$$a_{l1} X_1 = L^1 (1-\varphi \rho) \tag{5}$$

<sup>2</sup> In this model we assume away the other factors like educational skills and innovation activities. These factors lead to externality.

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