Self-Employment and Labor Market Policies

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June, 2008
Main Contributions

1. Integrates two strands of theoretical literature:
   – models of self-employment (Lucas 1978, Kanbur 1979, 1981, Kihlstrom and Laffont 1979, Jovanovic 1994) and
   – model of unemployment (search and matching model of Mortensen-Pissarides)

2. Analyzes the effects of taxes, minimum wage, and unemployment benefits on self-employment.
Importance of Self-Employment

– In the United States, about a 10 percent of all workers are self-employed (Evans and Leighton 1989, Hipple 2004).

– They operate most of the businesses and employ about a tenth of all wage (salaried) workers (Evans and Leighton 1989, Hipple 2004).

– In other OECD countries, the proportion of self-employed varies between 8-30 percent (Blanchflower 2004).

– Most of self-employed workers are own account workers (non-employers)

2. Negative relationship between the minimum wage and self-employment (Bruce and Mohsin 2006, Garret and Wallis 2006, Tables 2 and 3 of our paper).
Unemployment: Important Source of Self-Employment

“Poorer wage workers—that is, unemployed workers, lower-paid wage workers, and men who have changed jobs a lot—are more likely to enter self-employment…” (pp.521 Evans and Leighton 1989)

- In the U.S., unemployed are twice more likely to become self-employed (Evans and Leighton 1989).
- In Canada, unemployed are three-times more likely to become self-employed (Kuhn and Schuetze 2001).
- About 15-20 percent of the new entrants to self-employment are from unemployment pool in the U.S (our calculation).
Main Aim

1. Embed a model of occupational choice in the search and matching framework of Mortensen and Pissarides (Pissarides 2000).

2. Develop a model with four states: (i) Working on own account (ii) Being employer (iii) Wage employed and (iv) Unemployed.

3. Analyze the effects of public policies. In particular (i) Unemployment Benefit $b$ (ii) Minimum Wage $w^m$ (iii) Wage Tax $\tau_w$ (iv) Business Tax $\tau_d$.

Main Results

1. Higher unemployment benefits and minimum wage have negative effects on self-employment rate and transition of unemployed workers to self-employment.

2. A higher business tax and a lower wage tax reduce self-employment rate and transition of unemployed workers to self-employment.
Environment

- Continuous time.
- A labor market consisting of large number of infinitely lived and risk-neutral *ex-ante* identical individuals.
- Common discount rate $r$.
- Individuals can either be self-employed or wage workers.
- Self-employed either work on own account or are employers.
- Wage workers are either employed or unemployed.
Environment

- At any point in time in the economy following equality holds:

\[ E^O + E^N + N + U = 1 \]  \hspace{1cm} (2.1)

where \( E^O \), \( E^N \), \( N \), and \( U \) are measures of own account workers, employers, wage employed workers, and unemployed workers respectively.

- Becoming employer requires sufficient managerial ability and knowledge of hiring rules and regulations. These ability/knowledge are acquired randomly while working as own account worker.

- Thus, a self-employed worker first starts as own account worker.

- Starting a business requires a one time start up cost, \( K \).
Environment

- An own account worker produces $y$ units of goods per unit of time.

- At any point in time an own account worker receives an opportunity to acquire managerial ability and/or knowledge of hiring rules and regulations at a constant rate $\alpha$.

- The production function of an employer with $n$ employees is given by

$$F(n) = y + \phi n, \text{ with } \phi > 0. \quad (2.2)$$

- An employer faces the possibility of business failure. At any point in time, an employer receives the business failure shock with a constant rate $\mu$. 
Environment

- The labor market is characterized by search frictions i.e., opportunities to trade in the labor market arise randomly.

- For hiring wage workers employers have to create vacancies or job openings and search for wage workers. Let $\xi$ be the cost of creating and maintaining a vacancy per unit of time in terms of goods.

- Similarly, a wage worker who wants to find a job has to search for suitable vacancies. In other words, a wage worker first joins the rank of unemployed workers.
Environment

- Vacancies and unemployed workers are brought together by a CRS matching function $M(V, U)$ where $V$ is the total number of vacancies in the market.

- Once an unemployed worker and a vacancy are matched, the vacant job gets filled and starts producing.

- A filled job continues producing until it is terminated by an idiosyncratic exogenous shock. A filled job receives this shock at a constant rate $\sigma$ per unit of time.

- An employed worker becomes unemployed at the rate, $\sigma + \mu$. 
Environment

Denote the labor market tightness by \( q \equiv \frac{V}{U} \), the job arrival rate for unemployed workers by \( m^u(q) \) and the matching rate of vacancies by \( m^v(q) \). Let \( \gamma \) be the rate at which unemployed workers start business per unit of time.

Then the evolution of the number of unemployed workers, wage employed workers, own account workers, and employers over time are given by

\[
\dot{U} = (\sigma + \mu)N + \mu E^N - (m^u(q) + \gamma)U. \tag{2.5}
\]

\[
\dot{N} = m^u(q)U - (\sigma + \mu)N. \tag{2.6}
\]

\[
\dot{E}^O = \gamma U - \alpha E^O \tag{2.7}
\]

\[
\dot{E}^N = \alpha E^O - \mu E^N. \tag{2.8}
\]
The value functions of a vacant job, $J^v$, and filled job to an employer $J^n$ satisfy following functional equations:

\[ rJ^v = -(1 - \tau_d)\xi + m^v(q)(J^n - J^v) - \mu J^v \quad (3.1) \]

and

\[ rJ^n = (1 - \tau_d)(\phi - w) - \sigma(J^n - J^v) - \mu J^n. \quad (3.2) \]
Employers and Own Account Workers

The value function of an employer, \( \pi(n) \), satisfies

\[
    r\pi(n) = (1 - \tau_d)[y + \phi n - wn - \xi v] + \mu(\lambda^u - \pi(n)).
\]  \( 3.3 \)

The value function of an own account worker, \( \pi \), satisfies

\[
    r\pi = (1 - \tau_d)y + \alpha[\pi(n) - \pi] \quad (3.4)
\]
The value functions of the unemployed worker, $\lambda^u$, and employed wage worker, $\lambda^n$, satisfy

$$r\lambda^u = b(1 - \tau_w) + m^u(q)(\lambda^n - \lambda^u)$$

and

$$r\lambda^n = w(1 - \tau_w) - (\sigma + \mu)(\lambda^n - \lambda^u).$$
The wage solves

$$\max_w (\lambda^n - \lambda^u)^{1-\beta} (J^n - J^v)\beta$$

(3.10)

where $\beta \in (0, 1)$ is the bargaining power of an employer in the match. The wage function is given by

$$w = (1 - \beta)(\phi + \xi q) + \beta b.$$ 

(4.6)
Existence of Equilibrium

(3.1), (3.2), (4.6) along with free entry condition that $J^\nu = 0$ imply that equilibrium labor market tightness, $q^*$, satisfies

$$
\frac{r + \sigma + \mu}{m^\nu(q^*)} + (1 - \beta)q^* = \frac{\beta}{\xi}(\phi - b).
$$

(4.8)
Existence of Equilibrium

Because the opportunity cost of being an own account worker is to become an unemployed worker, equilibrium requires that agents be indifferent between these two states at the margin. Thus,

$$\pi - K = \lambda^U. \quad (4.9)$$

(4.9) gives the equilibrium average employer size, \( n \).

$$n^* = \left[ Ak + (r + \alpha + \mu) \left\{ (1 - \tau_w)(b + \frac{1-\beta}{\beta} \xi q^*) - (1 - \tau_d)y \right\} \right] \frac{\alpha \left( \beta(\phi - b) - (1 - \beta)\xi q^* - \xi \frac{\sigma + \mu}{m^v(q^*)} \right)}{\alpha \left( \beta(\phi - b) - (1 - \beta)\xi q^* - \xi \frac{\sigma + \mu}{m^v(q^*)} \right)}. \quad (4.10)$$

with

$$\frac{dn^*}{d\tau_w} < 0; \quad \frac{dn^*}{d\tau_d} > 0; \quad \frac{dn^*}{db} > 0.$$
Effects of Taxes

**Proposition 2** A higher business tax, $\tau_d$, and a lower wage tax, $\tau_w$, reduce the number of own account workers, $E^O$, employers, $E^N$, and the rate of inflow to self-employment from unemployment, $\gamma$. In addition, they increase wage employment, $N$, and unemployment, $U$. 
Proposition 3 A higher unemployment benefit, $b$, reduces the number of own account workers, $E^O$, employers, $E^N$, and the rate of inflow to self-employment from unemployment, $\gamma$. In addition, they increase wage employment, $N$, and unemployment, $U$.

Proposition 4 If at the initial equilibrium, $n + \frac{m^u(q)}{r+\sigma+\mu+m^u(q)} > 1$, a higher minimum wage, $w^m$, reduces the number of own account workers, $E^O$, employers, $E^N$, and the rate of inflow to self-employment from unemployment, $\gamma$. In addition, they increase wage employment, $N$, and unemployment, $U$. 