Financing Constraints and Employment – Evidence from Transition Countries

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Research question

Do firms‘ financing constraints inhibit the generation of employment?

Are the transition countries of Central and Southeastern Europe and Central Asia different from the typical high-income country?
Background: transition countries


Susan Steiner „Financial Constraints and Employment“, 31.05.2013
Background: transition countries

GDP as % of 1989

Background: transition countries

Employment ratio (15-59 y.o.)

Background: transition countries

LFS unemployment rate

Background: transition countries

EBRD Transition Report 2006 „Finance in Transition“:

- Transition countries have smaller financial sectors than would be expected on the basis of their income levels
- Financial markets remain underdeveloped despite recent improvements in credit and stock markets
- CEE with much higher financial development than SEE and CIS, especially with regard to banking
- Credit to private sector has increased by 70% in CEE, by 50% in SEE, no growth in CIS between 2000 and 2005
- Rapid growth of foreign banks (asset share: 70% in CEB and SEE)
- Benefits from financial development are greater for the more backward countries
# Background: transition countries

**Table 3.3**

<table>
<thead>
<tr>
<th></th>
<th>Small firms</th>
<th>Medium firms</th>
<th>Large firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without bank loans</td>
<td>Unable to obtain</td>
<td>Without bank loans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bank loans</td>
<td></td>
</tr>
<tr>
<td>CEB</td>
<td>60.8</td>
<td>27.3</td>
<td>41.9</td>
</tr>
<tr>
<td>SEE</td>
<td>59.7</td>
<td>29.1</td>
<td>39.8</td>
</tr>
<tr>
<td>CIS</td>
<td>67.5</td>
<td>34.9</td>
<td>51.5</td>
</tr>
<tr>
<td>Germany</td>
<td>37.2</td>
<td>14.6</td>
<td>24.6</td>
</tr>
</tbody>
</table>


Note: A firm is classified as “small” with fewer than 49 employees, “medium” with between 50 and 249 employees, and “large” with more than 250 employees. A firm is “financially constrained” if it does not have a loan, if it is in the process of applying for a loan, or has already applied but has been rejected, or has never applied for a loan but reports that it would need one.
What are financing constraints?

A firm is financially constrained if there is no interest rate such that the amount that the firm wants to borrow at that rate is equal to the amount that the market is willing to lend at that rate.

This implies that the supply curve of capital is not horizontal at some fixed interest rate.

(Banerjee and Duflo, 2008: p. 11)
Some Theory on Corporate Finance

- Neoclassical theory: A firm‘s investment decision should be independent of the source of financing. It should only depend on the profitability of the investment opportunity.
- This assumes that there are no market distortions, such as taxes, transaction costs, information asymmetries, and agency problems.
- BUT capital markets are imperfect
  - Adverse selection
  - Moral hazard
Some Theory on Corporate Finance

Figure 1. Informational Imperfections and Underinvestment

Some Theory on Corporate Finance

- With imperfect information about the riskiness of an investment project, adverse selection introduces a „lemons“ premium
- In the presence of incentive problems and costly monitoring, borrowers request a higher return to be compensated for these monitoring costs and to make sure that honest actions pay more
- Hence, external funding (equity, debt) is more costly than internal funding due to asymmetric information and agency problems
- Holding investment opportunities constant, an increase in net worth increases investment for those firms that face information costs
Measurement of financial constraints

1. Investment – cash flow sensitivity

\[ I_{it} = \alpha + \beta_1 Q_{it} + \beta_2 CF_{it} + \beta_3 X_{it} + \varepsilon_{it} \]

- \( I_{it} \) – gross investment of firm i at time t
- \( Q_{it} \) – sales growth of firm i at time t (as proxy for investment opportunities)
- \( CF_{it} \) – cash flow of firm i at time t (as proxy for net worth)
- \( X_{it} \) – firm characteristics
Measurement of financial constraints

2. A priori sorting of firms based on characteristics that are associated with information costs

- Size
- Age
- Foreign ownership
- Level of leverage
- Dividend payouts
- Business-group affiliation
- Degree of share holder concentration

3. Subjective assessment of financial obstacles by survey respondent
Financial constraints and physical investment

- A large body of literature has shown that financially constrained firms invest less.
- In times of crisis, when financial pressure increases, investment is generally reduced (Blalock et al, 2008; Campello et al, 2010).
- Konings et al. (2003) show investment-cash flow sensitivity for firms in Poland and Czech Republic, but not in Bulgaria and Romania.
Financial constraints and employment

- **Sharpe (1994):** over the business cycle, employment is sensitive to changes in output demand, more so for small firms and firms with high leverage.

- **Nickell and Nicolitsas (1999):** increases in financial pressure have a negative impact on employment and pay rises.

- **Benmelech et al. (2011):** when financing constraints become binding, firms adjust both factors of production, capital and labour.

- **Pagano and Pica (2012):** financial development allows firms to expand their use of both capital and labour.
Empirical strategy


\[
\text{Growth} = \alpha + \beta_1 \text{Government} + \beta_2 \text{Foreign} + \beta_3 \text{Exporter} \\
+ \beta_4 \text{Subsidy} + \beta_5 \text{Competition} + \beta_6 \text{Manufacturing} \\
+ \beta_7 \text{Services} + \beta_8 \text{Inflation} + \beta_9 \text{GDP per capita} \\
+ \beta_{10} \text{GDP} + \beta_{11} \text{Growth} + \beta_{12} \text{Financial constraint} + \epsilon
\]

- Show that financial constraints affect firms' growth rates adversely
Empirical strategy

\[ \text{Growth} = \alpha + \beta_1 \text{Government} + \beta_2 \text{Foreign} + \beta_3 \text{Exporter} \\
+ \beta_4 \text{Subsidy} + \beta_5 \text{Competition} \\
+ \beta_6 \text{Financial constraint} + \epsilon \]

- Control for sector and country
- Growth: change in sales, change in physical investment, change in full-time employment over the last 3 years
- Financial constraint: self-reported financial obstacle, use of loan, use of loan vs. financial constraint vs. no need
- Additional control variables: growth variables, size of firm, location, age
BEEPS data

- Business Environment and Enterprise Performance Survey (BEEPS) conducted by EBRD and World Bank
- Objective is to examine the quality of the business environment as determined by a wide range of interactions between firms and the state
- Manufacturing and services sectors are covered
- Questions concern issues of infrastructure and services, sales and supply, competition, innovation, finance, business-government relations, land and permits, and labor
- We use data from 2002 and 2005
BEEPS data: countries covered

Central and Eastern Europe (CEE)

- Czech Republic*
- Estonia*
- Hungary*
- Latvia*
- Lithuania*
- Poland*
- Slovak Republic*
- Slovenia*

South Eastern Europe (SEE)

- Albania
- Bosnia and Herzegovina
- Bulgaria*
- Croatia
- Macedonia
- Montenegro
- Romania*
- Serbia

* member state of the European Union
BEEPS data: countries covered

Commonwealth of Independent States (CIS)

- Armenia
- Azerbaijan
- Belarus
- Georgia
- Kazakhstan
- Kyrgyz Republic

- Moldova
- Russia
- Tajikistan
- Ukraine
- Uzbekistan
Our variables

Outcome variable:
1. Employment growth = percent change in number of full-time employees over the last three years

Crucial right-hand side variables:
1. Financial obstacles = self-reported assessment of whether access to finance is no, a minor, a moderate, or a major obstacle
2. Loan = self-report of whether the firm has currently an outstanding loan
Our variables

Control variables:
1. Government = government owns more than 25% of the firm
2. Foreign = a foreign entity owns more than 25%
3. Exporter = firm exports any part of its output
4. Subsidy = firm received a subsidy from national or regional government
5. No, few and many competitors = firm has 0, 1-3, or m4 and more competitors nationally
6. Investment growth = percent change of physical investment over the last three years
7. City = firm is located in capital or city larger than 1 mio.
8. Size of firm = Micro (<10 employess), small (10-49), medium (50-249) and large (>250)
9. Age = age of the firm
Descriptive statistics

Descriptive statistics

Is access to finance an obstacle? (2005)

[Bar chart showing the percentage of different business sizes facing no obstacle, minor obstacle, moderate obstacle, and major obstacle to accessing finance. The chart is labeled with the number of respondents for each category and the corresponding obstacle level.]
Descriptive statistics

Do firms have outstanding loans? (2005)

- The bar chart shows the percentage of firms with outstanding loans.
- The x-axis represents different firm categories: all, micro, SME, and large.
- The y-axis represents the percentage of firms.
- The chart indicates a higher proportion of large firms with outstanding loans compared to micro and SME firms.
Preliminary results: sales growth

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>-10.16*** (-3.35)</td>
<td>-3.84*** (-3.15)</td>
</tr>
<tr>
<td>Foreign</td>
<td>10.69*** (3.52)</td>
<td>5.93*** (3.42)</td>
</tr>
<tr>
<td>Exporter</td>
<td>11.18*** (5.27)</td>
<td>6.93*** (5.73)</td>
</tr>
<tr>
<td>Subsidy</td>
<td>2.54 (0.72)</td>
<td>2.14 (1.25)</td>
</tr>
<tr>
<td>Few competitors</td>
<td>-3.65 (-0.48)</td>
<td>n.a</td>
</tr>
<tr>
<td>Many competitors</td>
<td>-11.05 (-1.44)</td>
<td>n.a</td>
</tr>
<tr>
<td>Minor obstacle</td>
<td>-7.66*** (-2.80)</td>
<td>0.41 (0.34)</td>
</tr>
<tr>
<td>Moderate obstacle</td>
<td>-2.88 (-1.35)</td>
<td>0.71 (0.94)</td>
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<td>Major obstacle</td>
<td>-5.40** (-2.04)</td>
<td>-2.51* (-1.77)</td>
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<tr>
<td>Sector dummies</td>
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<td>YES</td>
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<tr>
<td>Country dummies</td>
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<td>YES</td>
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<tr>
<td>No. observations</td>
<td>5,348</td>
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<td>R-squared</td>
<td>0.077</td>
<td>0.067</td>
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### Preliminary results: investment growth

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2005</th>
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<tbody>
<tr>
<td>Government</td>
<td>-12.35*** (-5.87)</td>
<td>-6.47*** (-6.40)</td>
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<tr>
<td>Foreign</td>
<td>3.23 (1.46)</td>
<td>1.63* (1.73)</td>
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<tr>
<td>Exporter</td>
<td>5.05*** (2.91)</td>
<td>2.50*** (3.09)</td>
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<tr>
<td>Subsidy</td>
<td>4.09 (1.54)</td>
<td>4.70*** (2.79)</td>
</tr>
<tr>
<td>Few competitors</td>
<td>3.60 (1.20)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Many competitors</td>
<td>0.41 (0.17)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Minor obstacle</td>
<td>-5.48*** (-3.27)</td>
<td>-0.22 (-0.21)</td>
</tr>
<tr>
<td>Moderate obstacle</td>
<td>-1.80 (-1.04)</td>
<td>0.06 (0.06)</td>
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<td>Major obstacle</td>
<td>-3.20 (-1.17)</td>
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<td>R-squared</td>
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### Preliminary results: employment growth I

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>-31.05*** (-10.91)</td>
<td>-24.07*** (-9.53)</td>
</tr>
<tr>
<td>Foreign</td>
<td>7.49* (1.90)</td>
<td>6.03* (1.79)</td>
</tr>
<tr>
<td>Exporter</td>
<td>0.37 (0.15)</td>
<td>2.58 (1.03)</td>
</tr>
<tr>
<td>Subsidy</td>
<td>-1.35 (-0.47)</td>
<td>7.78* (1.99)</td>
</tr>
<tr>
<td>Few competitors</td>
<td>10.82** (2.50)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Many competitors</td>
<td>9.50** (2.21)</td>
<td>n.a.</td>
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<tr>
<td>Minor obstacle</td>
<td>-0.43 (-0.17)</td>
<td>2.48 (1.01)</td>
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<tr>
<td>Moderate obstacle</td>
<td>0.05 (0.01)</td>
<td>3.68 (1.57)</td>
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<td>Major obstacle</td>
<td>0.34 (0.09)</td>
<td>1.33 (0.38)</td>
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<td>Sector dummies</td>
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<td>Country dummies</td>
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<td>No. observations</td>
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<tr>
<td>R-squared</td>
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## Preliminary results: employment growth II

<table>
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<tr>
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<th>2002</th>
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<tbody>
<tr>
<td>Investment growth</td>
<td>-</td>
<td>0.328***</td>
<td>-</td>
<td>0.590***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(9.03)</td>
<td></td>
<td>(12.46)</td>
</tr>
<tr>
<td>Loan</td>
<td>3.58</td>
<td>1.07</td>
<td>8.83***</td>
<td>4.52**</td>
</tr>
<tr>
<td></td>
<td>(1.48)</td>
<td>(0.41)</td>
<td>(4.83)</td>
<td>(2.66)</td>
</tr>
<tr>
<td>No. observations</td>
<td>5,892</td>
<td>5,514</td>
<td>8,681</td>
<td>8,313</td>
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<tr>
<td>R-squared</td>
<td>0.078</td>
<td>0.114</td>
<td>0.074</td>
<td>0.110</td>
</tr>
</tbody>
</table>

Controlling for: government ownership, foreign ownership, exporter, subsidy, city, firm size, age. Included are sector and country dummies.
Is loan a good proxy for financial constraint?

Loan

- a) Do not want more credit
- b) Want more credit

No loan

- a) Do no want any credit
- b) Want more credit but got a loan application rejected
- c) Want more credit but are discouraged from applying
Is loan a good proxy for financial constraint?

Susan Steiner „Financial Constraints and Employment“, 31.05.2013
### Preliminary results: employment growth III

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment growth</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial constraint</td>
<td>-8.72***</td>
</tr>
<tr>
<td></td>
<td>(-4.32)</td>
</tr>
<tr>
<td>No need</td>
<td>-8.70***</td>
</tr>
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<td></td>
<td>(-4.26)</td>
</tr>
<tr>
<td>No. Observations</td>
<td>8,681</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Controlling for: government ownership, foreign ownership, exporter, subsidy, city, firm size, age. Included are sector and country dummies.

Financial constraint is defined as those firms that do not have a loan and say they are discouraged from applying for a loan or that got a loan application rejected.
Further steps

- Clarify the measurement of financial constraints
- Explain the differences between 2002 and 2005
- Lagged regressions
- Difference-in-difference estimation
- Take the labour market institutions of transition countries into account
- Think about