The Structure-Conduct-Performance paradigm revisited: an empirical analysis for Vietnamese firms

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1. Introduction

The relationship between firm behavior and market structure has been a central focus of study in the field of industrial organization (IO). Historically, the discipline's emphasis on firm behavior and market structure is, to a large extent, influenced by the work of a group of economists at Harvard in the 1930s. The SCP paradigm became the dominant framework for empirical work in IO between the early 1950s until the early 1980s. Its influence only began to wane in the 1980s with the emergence of game theoretical analysis of oligopolistic markets - an approach labeled as the `New Industrial Organization' (NIO).

There have been a large number of empirical researches in the literature examining the SCP hypothesis for various countries in the world. However empirical works in this literature for Vietnamese firms are still scared. This paper shed lights on this meaningful literature.

The paper is organized as follows. Section 2 provides an overview about SCP paradigm. Section 3 sketches the theoretical framework and empirical specifications of the model. Section 4 presents the SCP model for Vietnam. Section 5 describes data. Section 6 shows empirical results. Section 7 concludes the paper.

2. The SCP paradigm – an overview

The origin of the SCP paradigm can be traced to the work of the Harvard economist Edward Mason in the 1930s. The theoretical work of Mason's colleague Edward Chamberlin provided inspiration for both Mason and his student Joe Bain to study empirically how pricing and production policies of firms are determined. Mason (1939)'s (p.63) starting point was that market share is important in determining production and pricing policy of a firm. Mason argued that empirical analysis is essential to ensure that the theories of firm are useful. This is because theories are based on
Mathematical constructs such as demand and cost functions which are not ascertainable (in Mason's words, p.64). Thus, it is not that theories are not important; rather their relevance cannot be determined without empirical observations. This leads to the question of the set of empirical observations that are useful. Interestingly, Mason argued that the price and production decisions of a firm are influenced by both the internal organization of the firm and market structure.

Mason challenge for future empirical-policy work was subsequently taken-up by his Ph.D. student, Joe S. Bain. Despite being inspired by the work of Mason, the research methodologies of the master and his student were a bit different. Bain used industry-level data - an approach which Mason was a bit skeptical of. In contrast, Mason was more in favor of case studies involving specific firms or industries. It was Bain's work which proved to be more influential in charting the course of empirical IO after the 1930s.

The Structure-Conduct-Performance (SCP) Paradigm comprises of three major elements:

1. Structure refers to market structure. The variables that are used to describe market structure include seller concentration, degree of product differentiation and barriers of entry.

2. Conduct refers to a firm's behavior. The variables used to capture firm behavior include pricing strategies, collusion, advertising, research and development and capacity investment. Some have interpreted conduct as whether firms collude or compete.

3. Performance refers to outcome or equilibrium assessed in terms of allocative efficiency. The variables mostly used to measure performance are profitability and price-cost margin.

The SCP paradigm posits specific causal relationships between market structure, conduct and performance. In particular, market structure determines conduct and conduct in turn determines performance:

\[ \text{Structure} \rightarrow \text{Conduct} \rightarrow \text{Performance} \]

3. **Theory and Econometric Specifications in SCP**

The theoretical connection between market structure, conduct and performance can be formalized using a Cournot duopoly model. It can be shown that there is a direct link between the Lerner Index (L) and various variables such as a firm (i)'s market share (si), price elasticity of demand (\(\varepsilon\)) and its conjectural variation (\(\lambda_i\)): 
\[ L_i = \frac{P(Q) - MC(q_i)}{P(Q)} = \frac{s_i}{\varepsilon} (1 + \lambda_i) \]  

(*)

where \( \lambda_i = \frac{dq_i}{dq} \). Theoretically, the conjectural variation variable \( \lambda_i \) measures the output response of the firm's rivals. Scherer and Ross (1990) further suggest that it is also a measure of the degree of coordination (or collusion) between firms in the industry. The conjectural variation variable is determined by other factors:

\[ \lambda_i = f_1(C_j, B_j, X_{ij}) \]

where \( C_j \) is a measure of seller concentration, \( B_j \) a set of entry barrier measures and \( X_{ij} \) other industry or firm characteristics affecting the conjectural variation. The above equation provides the link between market structure and conduct. Substituting the second equation into the first, we obtain a link between structure and performance (the Lerner Index) for firm i:

\[ L_i = f_2(s_i, \varepsilon, C_j, B_j, X_{ij}). \]

In reality, the Lerner Index may not be observable. If there is a correlation between the Lerner index and measures of profitability (\( \pi_i \)), the above equation can be reformulated as:

\[ \pi_i = f_2(s_i, \varepsilon, C_j, B_j, X_{ij}). \]

The industry-level version can be written as:

\[ \pi_j = f_3(C_j, B_j, X_j). \]

It should be clear from the above specifications that the empirical test of the SCP entails testing for the relationship between structure and performance, taking conduct as either a black box or theoretically proven. The hypothesis underlying the above specifications is that concentration determines profitability.

**Measuring Performance**

A key issue in the empirical literature in SCP is the measurement of performance. A number of measures of performance have been used. Theory suggests that the Lerner Index is a good measure of the extent of a firm's market power:

\[ \text{Lerner Index} = (\text{Price} - \text{Marginal Cost}) / \text{Price}. \]
When the Lerner index > 0, firms are said to have market power. However, it is not always possible to derive the Lerner index empirically. It may be difficult to obtain marginal cost data. Furthermore, firms may have numerous products, each priced differently. A measure for performance that is conceptually closest to the Lerner index is the price cost margin (PCM) or the Tobin's q ratio.

Finally, accounting measures of performance are also used. There are various versions:

\[ \pi_1 = \frac{\text{profit}}{\text{revenue}} \]
\[ \pi_2 = \frac{\text{profit}}{\text{capital}} \]
\[ \pi_3 = \frac{\text{profit}}{\text{equity}} \]
\[ \pi_4 = \frac{\text{profit}}{\text{net worth}} \]

Market Value of Equity = equity/ revenue

There is no consensus on which is the best measure of performance. The choice of measure obviously depends on data availability and the desired aggregation level of analysis i.e. industry, firm or plant.

**Market Concentration**

The theoretical link between the Lerner Index (L) and market share (si) implies that we can measure market power by measuring market concentration as described in (*). Since si is directly related to the Lerner index, an obvious measure of concentration is the total market shares (\( \Sigma si \)) of firms. One such measure is the concentration ratio which measures the total market share of a given number of (m) firms with the largest market shares:

\[ \text{CR}_m = \sum si \]

One critique of the concentration ratio is that it does not take into account the distribution of market share across all firms in an industry. A concentration index that does not share this weakness is the Herfindahl-Hirschman Index (HHI):

\[ \text{HHI} = \sum si^2 \]

The HHI is also directly related to the Lerner Index. For an industry with n firms, the industry's weighted average Lerner Index is:

\[ L = \sum si \frac{L_i}{\epsilon} \]

If we assume that for all firms, \( \lambda_i = \lambda \), then:
L = [(1 + \lambda) \text{HHI} / \varepsilon]

The CR and HHI are the two most commonly used concentration indices used in empirical SCP studies.

**Barriers to entry**

The functional specification for SCP includes also barriers to entry as an explanatory variable for performance. Barriers of entry can be either structural or strategic in nature. Structural barriers of entry are exogenously determined. They include scale economies and product differentiation. In contrast, strategic barriers of entry arise from strategies that deter entry (e.g. limit pricing) or force rival firms to exit (predatory pricing). The empirical literature on SCP has concentrated mostly on quantifiable structural barriers of entry.

One such barrier to entry is the minimum efficient scale (MES) of production in relation to the size of market demand. This has been measured by the ratio of sales of plants at the midpoint of industry plant size distribution to total industry sales. An alternative measure is the cost disadvantage ratio which is the ratio of value-added per worker in plants below MES to that in larger plants. Another type of barrier to entry that is widely used in empirical SCP studies is product differentiation which is proxied by the ratio of advertising expenditure to sales.

Barriers to entry can be defined in a variety of ways – any factors that increases the unit production cost of new entrants, or any impediments that imposes a cost on new entrants but not on the incumbents. In order to find out the factors that constrain the entry of new firms in the market, most studies have used data at industrial level (Bain, 1956; Orr, 1974; Mata, 1991; von der Fehr, 1991; Schwalbach, 1991; Christian, 2003; Balcerowicz, 2003; Xhillari, 2003). These studies mostly show that entry barriers can be economies of scale, sunk costs, industry concentration, capital requirements, advertising intensity, research and development intensity, and regulations and institutions.

The work of Bain (1956) is considered as the first thorough study of entry barriers in which an entry barrier is defined as anything that allows incumbents to earn above-normal profits without inducing entry. By examining twenty United States manufacturing industries, he concluded that the most significant barriers to entry were product differentiation, economies of scale, and control of patents or scarce resources. Later on, many empirical studies have repeated the results of Bain (1956) with different samples and extended the research with other variables. Orr (1974) presents a long list of determinants of entry across the Canadian manufacturing industries. His work shows that
capital requirements, advertising intensity, and high concentration of industries are significant barriers to entry; research and development intensity and risk are modest barriers to entry, while past profit rates and past industry growth rate had a positive but weak impact on entry. The study of Kessides (1984) on the 4-digit U.S. manufacturing industries indicates that advertising impedes entry since necessary advertising expenditures give rise to a sunk cost which raises the risk of entry. He argues that high levels of advertising lead to increased monopoly power and ultimately to sustained supernormal profit. More recently, Mata (1991) when studying the entry barriers to new firms in Portugal finds that all the conventional entry barriers such as economies of scale, product differentiation and capital requirements have negative and significant in the small-scale equation, but not in the large-scale equation. With regard to sunk costs, however, they seem to be important only for large entrants. These empirical results are also found in the studies of von der Fehr (1993) on the domestic entry in Norwegian manufacturing industry and Schwalbach (1993) on German firms.

The above empirical findings on barriers to entry are completely based on the experience of developed market economies. However, the freedom of entry and exit condition for economies in transition assumes an even more significant dimension than in the already-established market economies. This is, according to Balcerowicz et al. (2003), because of massive distortions of the economic structure, highly monopolistic and oligopolistic markets, and a large average firm size that transition economies inherited from their communist regime. With the collapse of the communist regime, the transformation of the old economic structure had to take place through the entry of new, market-oriented firms particularly in the under developed sectors of the economy and the exit of inefficient and uncompetitive enterprises. Free entry will ensure that potential entrepreneurs can take advantage of profitable opportunities and enter the profitable segments of the market, lowering output prices and improving the overall allocation of resources.

As the arguments of Balcerowicz et al. (2003), new firms have to go through two stages before being established in the market: the initial creation and the early development. New entries not only face a number of important and relatively severe barriers to entry, but also face continued difficulties even when they have succeeded in overcoming the early barriers. In each stage, they face a number of problems and impediments specific to that stage. New firms need a conductive environment and a supportive institutional framework for one to two years before they can spread roots and develop their own relationships with customers and suppliers. Nurturing and support is
not achieved by subsidization but by the creation of level playing field, the provision of information, and minimizing the unnecessary restrictive procedures. Balcerowicz et al. (2003) divide the main constraints faced by new entrants in the two stages of development into four specific areas: regulatory barriers including the legal, institutional and fiscal environment; financial constraints influencing the availability of initial capital and investment resources; information barriers including the knowledge of the available support programs; and the competitive environments, particularly the role of existing state-owned and privatized firms and the informal economy.

**Other Independent Variables**

Aside from industry concentration and barrier to entry, other independent variables that have been used in empirical investigation of SCP includes buyer concentration (which affects seller's profit margins), industry growth (to capture industry disequilibrium), ratio of imports to domestic production or consumption (to capture the influence of imports), and geographic dispersion measures (to capture the effect of regional or local markets). Firms’ characteristics are also included as the explanatory variables as they are theoretically well established to explain performance.

### 4. The SCP model for Vietnam enterprises

In this work, we revisit the SCP paradigm for Vietnamese firms as a whole. We adopt the following econometric equations:

\[
\text{profit} = \alpha_0 + \alpha_1 s_i + \alpha_2 \text{hhi} + \alpha_3 \text{labor} + \alpha_4 \text{bte} + \alpha_5 \text{limited} + \alpha_6 \text{cooperative} \\
+ \alpha_7 \text{state} + \alpha_8 \text{jointstock} + \alpha_9 \text{fdi} + u
\]  

(1)

\[
\text{roa} = \beta_0 + \beta_1 s_i + \beta_2 \text{hhi} + \beta_3 \text{labor} + \beta_4 \text{bte} + \beta_5 \text{limited} + \beta_6 \text{cooperative} \\
+ \beta_7 \text{state} + \beta_8 \text{jointstock} + \beta_9 \text{fdi} + u
\]  

(2)

where:

- Profit is the profit before tax of firms
- ROA is the ratio of profit to asset of firms
- $s_i$ is the market share of firms in the industry
- Hhi is the concentration index of the market that is measured as followings:

\[
\text{HHI} = \sum_{i=1}^{N} s_i^2
\]
where $s_i$ is market share of firms in the industry and $N$ is number of firms in the industry. The values of HHI fall in the interval of $[1/N, 1]$. A small HHI implies that there are no dominant firms in the market, the larger the HHI, the larger the industrial concentration.

- Labor is total number of labors of firms
- Limited is a Dummy variable that takes the value of 1 if firms are limited liability companies, zero otherwise.
- Cooperative is a Dummy variable that takes the value of 1 if firms are cooperative, zero otherwise.
- State is a Dummy variable that takes the value of 1 if firms are state-owned enterprises, zero otherwise.
- Jointstock is a Dummy variable that takes the value of 1 if firms are joint stock companies, zero otherwise.
- Fdi is a Dummy variable that takes the value of 1 if firms have foreign direct investments (wholly-owned foreign enterprises and joint venture enterprises), zero otherwise.
- Private is a Dummy variable that takes the value of 1 if firms private enterprises, zero otherwise.
- BTE: barrier to entry in the market, proxied by entry costs in the market in provinces.

5. Data

This paper uses the data from the surveys on the enterprises in Vietnam conducted by the General Statistics Office of Vietnam from 2008 to 2011. An enterprise in these surveys is defined as “an economic unit that independently keeps business account and acquires its own legal status. It may be set up and operate under the regulations of State Enterprise Law, Cooperative Law, Enterprise Law, Foreign Investment Law or the Agreements between the Government of Vietnam and the Governments of Foreign Countries” (The GSO, 2012). There are three types of enterprise in the surveys:
The state enterprises at central level and at local level, including also enterprises which are under the control of the Communist Party and mass organizations of which the capital is provided by the government.

The non-state enterprises: enterprises set up by Cooperative Law except cooperatives of agricultural, forestry, and fishing sectors; private enterprises; collective name enterprises; limited liability companies; joint-stock companies including also privatized state enterprises and companies which have the capital share of the Government less than 50%.

The foreign enterprises: wholly-owned foreign enterprises and joint venture enterprises.

These enterprises belong to all industries excluding cooperatives of agricultural, forestry, fishing sectors and business households. Industrial classification is based on main activity of the enterprise that contributes the largest share to total gross output of the enterprise. The number of enterprises in the surveys and their statistical indicators are counted only when they are still operating by the 31st of December every year, excluding enterprises that had received business licenses, tax codes but still do not operate; enterprises that were dissolved or jointed to other enterprises; enterprises that got operation licenses but do not locate in local area; economic units that do not independently keep business account such as branches, dependent economic units and other non economic bodies.

The contents of the surveys cover indicators to identify enterprises including their name, address, type, and economic activities of the enterprises, and indicators to reflect production situations of the enterprises such as their employees, income of employees, asset and capital source, turnover, profit, contributions to the state budget, investment capital, taxes and other obligations to the government, job training, and evaluations on the investment environment. Therefore, all of the variables (except the variable BTE) in our study can be measured by using the data source of these surveys.

The variable BTE reflecting barrier to entry in the market is proxied by the entry costs in the market in different provinces in Vietnam. Entry cost is one of ten sub-indices to construct the composite index PCI (The Vietnam provincial competitiveness index). The PCI was developed at the first time in 2005 by the Vietnam Chamber of Commerce and Industry (VCCI) and the U.S. Agency for International Development (USAID)-funded Vietnam Competitiveness Initiative (VNCI). The PCI is an effort to explain the reasons why some parts of the country perform better than others in terms of private
sector dynamism and growth. Each sub-index is standardized to a ten-point scale, whereby the best and worst performing provinces are awarded the scores of 10 and 1 respectively, and the other 62 provinces distributed somewhere along scale between these two scores. The sub-index “entry costs” reflects:

- Percentage of firms waiting over 01 month to start a business
- Percentage of firms waiting over 03 months to start a business
- Effective land wait days (determined by government efforts, not supply/demand conditions)
- Length of business registration in days
- Length of business re-registration in days
- Number of licenses and permits required to operate
- Percentage of firms having difficulty to obtain all licenses/permits to start a business

Table 1 presents the descriptive statistics of the variables.

### Table 1: Descriptive statistics

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>profit</td>
<td>868523</td>
<td>1319</td>
<td>144187</td>
<td>-39100000</td>
<td>48400000</td>
</tr>
<tr>
<td>2</td>
<td>roa</td>
<td>867496</td>
<td>-0.0789</td>
<td>263.4512</td>
<td>-196820</td>
<td>144062</td>
</tr>
<tr>
<td>3</td>
<td>si</td>
<td>868511</td>
<td>0.0004</td>
<td>0.0073</td>
<td>-0.0032</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>hhi</td>
<td>868511</td>
<td>0.0180</td>
<td>0.0437</td>
<td>0.0017</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>labor</td>
<td>868523</td>
<td>39.97</td>
<td>367.96</td>
<td>1</td>
<td>87279</td>
</tr>
<tr>
<td>6</td>
<td>bte</td>
<td>868093</td>
<td>7.7245</td>
<td>1.0790</td>
<td>5.07</td>
<td>9.52</td>
</tr>
<tr>
<td>7</td>
<td>limited</td>
<td>868523</td>
<td>0.0103</td>
<td>0.1011</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>cooperative</td>
<td>868523</td>
<td>0.0511</td>
<td>0.2202</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>state</td>
<td>868523</td>
<td>0.0047</td>
<td>0.0684</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>jointstock</td>
<td>868523</td>
<td>0.1870</td>
<td>0.3899</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>fdi</td>
<td>868523</td>
<td>0.0250</td>
<td>0.1560</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

6. **Estimation results and robustness tests**
Table 2 shows the results of Breusch-Pagan/Cook-Weisberg test for heteroskedasticity in model (1) and model (2). Test results indicate that heteroskedasticity is present in the models.

Table 2: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

<table>
<thead>
<tr>
<th>H₀: Constant variance</th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chi²</td>
<td>1.17e+9</td>
<td>1.14e+7</td>
</tr>
<tr>
<td>p-value</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

The paper hence applies three alternative methods including logarithm transformation, weighted least squares and Huber-White standard errors.

6.1. Transforming to logarithm

Since some variables as profit, roa may be zero or have negative value (≤ 0) in several observations, we must add a value to each variable to ensure that all the variables are greater than zero before transforming to logarithm. The added value is calculated by the absolute value of minimum in each variable. Model (1) and model (2) become:

\[
\log(\text{profit}) = \alpha_0 + \alpha_1 s_i + \alpha_2 hhi + \alpha_3 labor + \alpha_4 bte + \alpha_5 limited + \alpha_6 \text{cooperative} \\
+ \alpha_7 \text{state} + \alpha_8 \text{jointstock} + \alpha_9 fdi + u \\
\]

\[
\log(\text{roa}) = \beta_0 + \beta_1 s_i + \beta_2 hhi + \beta_3 labor + \beta_4 bte + \beta_5 limited + \beta_6 \text{cooperative} + \beta_7 \text{state} + \beta_8 \text{jointstock} + \beta_9 fdi + u \\
\]

However, the test results show that heteroskedasticity is still present in model (1.1) and (2.1) (Table 3). Therefore we have to move on to the second alternative.

Table 3: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

<table>
<thead>
<tr>
<th>H₀: Constant variance</th>
<th>(1.1)</th>
<th>(2.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chi²</td>
<td>8.62e+6</td>
<td>122009.61</td>
</tr>
<tr>
<td>p-value</td>
<td>0.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>
6.2. Weighted least squares

Another option is using weighted least squares (WLS). This method bases on the technique of generalized least squares (GLS) that always yields estimators that are BLUE even when either heteroscedasticity or serial correlation are present.

Firstly, we must determine the independent variable which causes heteroscedasticity through the graphs of residuals.

With regard to model (1), we have 4 graphs below:

With regard to model (1.1), we have 4 graphs below:
As can be seen from the graphs in two cases, the graph of variable bte (barrier to entry) shows more uneven envelopes of residuals because the width of the envelopes for some values of bte is more often considerably larger than for the other values. Thus, bte may be the correct weight for WLS method.

*Table 4* shows the estimation results after using WLS for model (1) and (1.1)

<table>
<thead>
<tr>
<th>Variable</th>
<th>profit (1)</th>
<th>log(profit) (1.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>si</td>
<td>5089624***</td>
<td>0.095***</td>
</tr>
<tr>
<td></td>
<td>(218.58)</td>
<td>(56.39)</td>
</tr>
<tr>
<td>hhi</td>
<td>20629.80***</td>
<td>0.00053**</td>
</tr>
<tr>
<td></td>
<td>(5.61)</td>
<td>(2.00)</td>
</tr>
<tr>
<td>labor</td>
<td>18.48***</td>
<td>4.82e-7***</td>
</tr>
<tr>
<td></td>
<td>(39.34)</td>
<td>(14.16)</td>
</tr>
<tr>
<td>Variable</td>
<td>Estimate</td>
<td>Std. Err.</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>-----------</td>
</tr>
<tr>
<td>bte</td>
<td>188.97</td>
<td>0.00002**</td>
</tr>
<tr>
<td>limited</td>
<td>-10564.68***</td>
<td>-0.00010</td>
</tr>
<tr>
<td>cooperative</td>
<td>-59.28</td>
<td>-4.69e-6</td>
</tr>
<tr>
<td>state</td>
<td>2868.23</td>
<td>0.00024</td>
</tr>
<tr>
<td>jointstock</td>
<td>-1386.03***</td>
<td>-0.00009</td>
</tr>
<tr>
<td>fdi</td>
<td>-72.69</td>
<td>0.00003</td>
</tr>
<tr>
<td>constant</td>
<td>-2936.32</td>
<td>17.48</td>
</tr>
</tbody>
</table>

| Summary Statistics | | |
|-------------------|-----------------|
| R-square          | 0.0619          |
| Observation       | 868081          |

Note: ***; **; *: significant at 1%; 5%; 10% level

T-statistics are in the parentheses

Weight = (1/bte^2)

Do the same steps for model (2) and (2.1). With regard to model (2), we have 4 graphs below:
The graphs of residuals are not clear enough to determine the weight correctly for WLS method. So we cannot use WLS in this case.

6.3. **Huber-White standard errors estimates**

When heteroskedasticity is present, Huber-White standard errors (robust standard errors) tend to be more trustworthy than OLS. The use of Huber-White standard errors does not change coefficient estimates, but the t-statistics will be change (because the standard errors are changed). Hence, this method gives reasonably accurate p-values for the models.

*Table 5* shows the estimation results after using Huber-White standard errors to deal with heteroskedasticity.

**Table 5: Estimation results by using Huber-White standard errors**

<table>
<thead>
<tr>
<th>Variable</th>
<th>profit</th>
<th>log(profit)</th>
<th>roa</th>
<th>log(roa)</th>
</tr>
</thead>
</table>
### Table

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(1.1)</th>
<th>(2)</th>
<th>(2.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>si</td>
<td>5326517***</td>
<td>0.10***</td>
<td>2.35</td>
<td>-0.00003</td>
</tr>
<tr>
<td></td>
<td>(3.35)</td>
<td>(3.55)</td>
<td>(0.13)</td>
<td>(-0.40)</td>
</tr>
<tr>
<td>hhi</td>
<td>19290.28</td>
<td>0.00048*</td>
<td>3.38</td>
<td>0.00009</td>
</tr>
<tr>
<td></td>
<td>(1.45)</td>
<td>(1.74)</td>
<td>(1.43)</td>
<td>(1.09)</td>
</tr>
<tr>
<td>labor</td>
<td>19.48**</td>
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<td>(2.99)</td>
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<td>(1.58)</td>
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**Note:** ***; **; *: significant at 1%; 5%; 10% level.

*T*-statistics are in the parentheses.

Basis category of ownership type: private enterprise.

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### 7. Concluding remarks

Three alternative estimations provide evidences for interesting insights. Two variables of interest to us that are the concentration ratio HHI and barriers to entry are statistically significant in the robust estimations. Higher concentration ratio yields higher performane of firms. The ease of accessing different provinces in Vietnam – a special type of barriers to entry – proves to generate higher performance of firms. In general, the SCP paradigm fits Vietnamese firm data well.
References

Ana Rosado Cubero, (2010), Barriers to competition: the evolution of the debate, London Peckering and Chatto.


