# Chapter 6

## Integrating Lao SMEs into a More Integrated East Asia Region

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*Lao SMEs are at an early stage of development and regional economic integration brings both opportunities and challenges to them. In order to promote SMEs as engines of growth, it is crucial to understand the issues SMEs face during the economic integration process. The main objective of this study is to examine the barriers confronting Lao SMEs and to identify factors enabling successful participation in production networks 151 samples from a nation-wide survey are used for this study. The results show that recently Lao SMEs have performed quite well, but they are still facing various issues; financial constraints are the biggest challenge for Lao SMEs. The characteristics of SMEs in production networks are strong business capacities, a high share of foreign investors, and the ability to access financial sources.*

# 1. Introduction

The economic integration of the ASEAN and East Asian regions has accelerated economic growth, and increased development of regional-and international-level production networks[1]. However, there is still a big gap in the economic development and production networks in this region.

Laos began integrating its economy and production networks into the region by joining ASEAN in 1997 and aims to integrate into the international networks by joining the World Trade Organization (WTO) in 2010. As the Lao economy is still in the early stages of development and lags behind other countries, regional integration presents both opportunities and challenges.

There are various benefits that may be derived from participating in production networks, such as better access to external business resources and knowledge, technology, and finance sources.

Promoting SMEs to join the production networks and subcontracting with large firms/Multi National Enterprises (MNE) could provide a short cut to enhancing SME competitiveness. However, linking up with large firms is rather dependent on practices and preferences and government support. Therefore, integrating Lao SMEs into Global/ASEAN production networks is crucial to developing the SMEs' competitiveness.

Despite the opportunities and complexities of participating in regional and global production networks, studies related to Lao SMEs in production networks are limited. Therefore, the main objective of this study is to gain a better understanding of the characteristics of, and barriers facing Lao SMEs, in order to facilitate participation in production networks. In order to do this, this study has 4 more specific objectives. The first is to examine the barriers facing Lao SMEs. The second is to identify the factors which allow for better participation in production networks. The third is to assess the factors affecting labor productivity using a multi-regression model. The fourth is to assess the factors affecting participation in production networks using an econometric

1 See more studies on SMEs in production networks in Eanst and Kim (2002), Obashi (2009a; 2009b), Kimura and Obayashi (2009), Nicolas (2009), Tambunan (2005) and Tilman (1999).

model. This study used information from an SME survey (151 samples) conducted by the author in October 2009.

The rest of this paper is organized as follows. Section 2 provides background on SME promotional policies. Section 3 provides information on recent economic developments and barriers to SMEs from a general perspective. Section 4 indentifies the characteristics of SMEs inproduction networks. Section 5 assesses the current government support programs for SMEs. Section 6 identifies the factors affecting labor productivity and joining production networks using an econometric model. The final section is concludes and contains policy recommendation.

## 2. SME Promotional Policies

### 2.1. Overall Enterprise Policy Reforms

Policies promoting enterprise development have been in place since the New Market Mechanism was introduced in 1980. In order to promote the private sector, the government began to privatize state-owned enterprises and introduced modern commercial laws and regulations in the mid-1990s.

Before the introduction of the New Market Mechanism, most large enterprises were State-Owned Enterprises (SOEs). Since then, the government has embarked on a major privatization program with two pillars. The first was transferring SOEs to private ownership (including joint ventures with domestic and foreign enterprises). The second was the privatization of markets by allowing private enterprise (including foreign-owned enterprise) to operate more freely (Bird, 2010). As a result, the number of SOEs was reduced from more than 800 in the early 1990s to 149 in 2004. While the contribution of SOEs to the economy has declined, some industrial sectors (cement, steel, pharmaceuticals, food processing and beverages), the financial sector, and utilities are still state-owned.

In 1994 the government introduced the Business Law, which allowed enterprises to operate freely. In 2006, the government replaced the Business Law with the Enterprises Law in order to reduce administrative costs and barriers. This law introduced a negative

list for registration, promised a 10 day registration period, and simplified registration procedures (Bird, 2010). The government also began to actively promote Foreign Direct Investment (FDI) by introducing the Law on Promotion and Management of Foreign Direct Investment in 1994. To promote FDI and provide more incentives, this law was amended in 2004.

These laws had been important in promoting investment, but because foreign and domestic investors were covered under different investment laws, approval conditions and national treatment were compromised. In order to correct these weaknesses, in July 2009 the National Assembly passed a new investment law. It merges the domestic and foreign investment laws; moves towards national treatment for domestic and foreign investors; eliminates barriers for obtaining investment licenses; and defines investment incentives better (Bird, 2010).

In sum, government has introduced new laws, regulations and programs to support the private sector and increase its competitiveness.

### 2.2. SME Promotion Policies and Production Networks

The Prime Minister's Office defines SMEs as enterprises that are legally registered and operating according to the prevailing laws of Laos. It classifies SMEs into the following categories: (a.) Small enterprises are those having an annual average number of employees not exceeding 19 people or total assets not exceeding 250 million kip or an annual turnover not exceeding 400 million kip, (b.) Medium sized enterprises are those having an annual average number of employees not exceeding 99 people or total assets not exceeding 1200 million kip or an annual turnover not exceeding 1 billion kip.

In order to promote SME and private sector development in Laos, the government has promulgated Primary Office Decree No.42/PM. The goals of this decree are as follows: a) to improve the regulatory environment; b) to enhance the competitiveness of establishments; c) to expand domestic and international market access; d) to improve access to finance; e) to encourage the development of business organization; f) to enhance entrepreneurial attitudes and characteristics within society. Furthermore, Prime Minister's Degree No. 42/PM established the SME Promotion and Development Office (SMEPDO). The main objective of SMEPDO is to promote the establishment and sustainable development of SMEs. Promoting Lao SMEs in the Asian production

networks is an important means of doing so. In order to promote SMEs, SMEPDO has launched market fairs for SMEs to show and sell their products and exchange information between firms. SMEPDO has also encouraged links between SMEs and FDI.

In addition to SMEPDO, the Lao National Chamber of Commerce and Industry (LNCCI) supports networking between domestic and foreign firms and maintains links between local industries and various government ministries/agencies in order to eliminate impediments that hinder the competitiveness of Lao enterprises in the international market. International organizations are also important sources of support for promoting SME development in Laos.

Despite the work of these organizations, however, SMEs still have issues to overcome before they can fulfill their potential as engines of economic growth in Laos. Until now there have been no SME laws, no an SME Promotion Bank (or SME Fund) to support and promote SME development. Even now, SMEPDO does not have specific programs supporting networking between SMEs and FDI. Finally, previous networks between SMEs, contractors and suppliers seemed to be very poor (Kyophilavong, 2008). Although these networks have seemed to improve as Laos has enhanced economic integration, the government still needs to support internal and external networking.

## 3. Recent Economic Developments and Barriers to SMEs

### 3.1. Recent Economic Developments and the Role of SMEs

The national development goal is to remove the country from the group of least developed countries (LDC) by the year 2020 (GoL, 2004). SME development is crucial to achieving this national goal.

Laos is an agriculture-based economy. In 2005, the agriculture sector accounted for 44% of the GDP of 2.8 US$ billion; industry accounted for 30% and services for 26%. (World Bank, 2008). However, since 2003, the industrial sector has grown more than 10%, causing the agriculture share of GDP to decline.

Since the NEM was introduced in 1986, Laos has been in transition from a centrally planned economy to a more market-oriented economy. As a result, with the exception of a period of negative growth following the Asian financial crisis of 1997, Laos had generally been achieving high rates of economic growth with low inflation. From 2000-2007 the average economic growth rate was about 7%. Since 2005 inflation has been maintained below double digits; it was about 4.5% in 2007 (World Bank, 2008). Since 2005 the exchange rate has also appreciated, to 9,670 kip per US$ in 2007 compared to 10,655 kip per US$ in 2005.

Even though Laos has been maintaining high economic growth with low inflation and a stable exchange rate, it still has serious macroeconomic issues to overcome.

First, Laos is basically facing chronic twin deficits in government spending and international trade. Deficit financing is mainly dependent on foreign sources. The budget deficit to GDP ratio was 2.5% in 2007 (fiscal year) compared to 4.4% in 2005 (fiscal year) (World Bank, 2008). The current account balance deficit to GDP ratio was 17.8% in 2005 compared to 17.4% in 2007 (IMF, 2008).

Secondly, recent economic development in Laos is highly dependent on resources such as mining and hydroelectricity. Recently, Laos was ranked as one of the most resource-rich countries in Asia[2]. More than 570 mineral deposits have been identified, including gold, copper, zinc and lead (World Bank, 2004). Laos is also traditionally known to have a high potential for hydropower production, about 26,000 MW (excluding mainstream Mekong); only 9% of its capacity was being used in 2004 (Pholsena and Phonekeo, 2004). Therefore, since 2002 FDI has flowed rapidly into Laos, especially in resource sectors. In 2007, the actual FDI inflows were estimated as about US$950 million, an increase of 60% from 2006. About 90% of FDI value is related to the resource industry. Economic growth was about 7.5% in 2007, and the resource sector accounted for 2.5% of this growth (World Bank, 2008). Theoretically, abundant natural resources could promote growth through more investment in infrastructure, health care and human capital development. However, various empirical studies have illustrated that resource-rich countries fail in accelerating growth compared with resource-poor countries for a number of reasons. One important cause of low

[2] See the comparison of Lao resource sectors with other countries in Appendix 1.

growth in resource-rich countries is “Dutch disease” syndrome occurs when capital inflows give rise to an appreciation of the real exchange rate, which in turn has a negative effect on tradable goods production (Sachs and Warner, 2001; Coden 1982; and Coden and Neary, 1982). Tradable goods such as agricultural and industrial goods are the engines of long-term economic growth, and therefore a shrinking tradable sector leads to declining growth.

In order to cope with Dutch Disease and ensure long-term economic development, diversifying economic activity and appropriate macroeconomic management are crucial (Kyophilavong and Toyoda, 2008). SMEs help diversify the economy and generate employment, income and new technology.

### 3.2. The Current Situation and Barriers

Unfortunately, there is a lack of data on enterprises in Laos. Therefore, information about the contribution of SMEs to economic activities is not available. The NSC conducted The Economic Census in 2006 and provided initial information on the size distribution of enterprises (NSC, 2007). The results showed that micro, small and medium-size enterprises dominated the private sector but there were few large firms in the economy. There were a total of 126,913 enterprises employing 346,000 persons. About 93% of enterprises employed less than 5 workers. About 23% of enterprises were located in Vientiane, 30% in the north, 32% in the central region, and 16% in the south. Only 40% held trade registration certificates and 71% held tax registration certificates. The trade sector, including wholesale and retail, was the major source of employment, accounting for about 64% of all employment in all sectors. This survey showed that Lao enterprises were relatively small in terms of employment and sales.

However, SME development seems to have expanded. GTZ (2008) conducted a survey of 390-460 registered establishments in 2005 and 2007, and the results showed that enterprise growth was quite dynamic. Most establishments reported that their activities were expanding. In addition, Kyophilavong *et al.*, (2006) confirmed that about 10% of establishments perceived their business as running very well and more than 17% were optimistic about the future of their business.

According to my knowledge, there are 3 studies of barriers facing SMEs in Laos. First, GTZ (2008) provides information on changes in the awareness of barriers facing

SMEs. The top 4 barriers facing SMEs in 2007 were; access to capital, finding skilled technical labor, access to technology and business development service providers, and increased fees and regulations. Secondly, Kyophiavong *et al.,* (2007) carried out a survey of SMEs in 2006 and collected more than 16,000 samples. According to the survey results, the top 3 obstacles to running SMEs were taxation, macroeconomic stability, and access to finance. Thirdly, ADB-Word Bank (2007) carried out a survey on the enterprise investment climate in 2005. The major constraints facing enterprises were identified as infrastructure, regulation, taxation, macroeconomic stability, and access to finance.

In sum, the main barriers for SMEs are access to finance, taxation and regulation, and the business climate, including macroeconomic stability.

## 4. Constraints on SME Growth

### 4.1. Description of the survey

In order to obtain a valid, representative sample, the survey was divided into 2 parts: the sampling section process and the survey process. The sampling process followed 4 steps. (1) Collection of a list of establishments from the tax department in the Ministry of Finance, and the enterprise register office at the Ministry of Industry and Commerce. (2) Selection of SMEs which had a contact phone number and detailed address. (3) Division of SMEs was by detailed sectors. (4) Division of SMEs by sectors into big, medium and small.

After finishing the sampling section process, the survey process was conducted as follows. (1) Interviewers (students and lecturers from FEBM), including a pre-test in order to gather feedback from the questionnaire translation. (2) SME owners/directors to be interviewed were called to confirm their willingness to participate in the survey. (3) Appointments were made with owners/ directors of establishments. (4) Face to face interviews were conducted.

The sampling is shown in Table 1. 151 samples were collected in the main cities and provinces in Laos. The sample included 7 sectors such as garments (23%),

parts/machines (3%), wood processing (17%), construction (13%), food/beverages (22%), manufacture (12%), and handicraft (5%). This diversified sample seems to mirror the real situation of Lao SMEs structure. The definition of SMEs in/outside production networks follows Narjoko and Oum (2009). 40 respondent SMEs were members of production networks, while 111 were not.

**Table 1. Sample Distribution**

| | Sample | Percent |
|---|---|---|
| Vientiane city | 79 | 52.3 |
| Savannakhet province | 37 | 24.5 |
| Champasack | 35 | 23.2 |
| Total | 151 | 100.0 |

*Source:* Author.

**Table 2. Sample Framework**

| Sector | Production network | | Overall |
|---|---|---|---|
| | Out | In | |
| Garment | 21 | 14 | 23.2 |
| Parts/machine | 8 | 1 | 3.3 |
| Wood process | 17 | 9 | 17.2 |
| Construction | 16 | 4 | 13.3 |
| Food/beverage | 25 | 9 | 22.5 |
| Manufacture | 16 | 3 | 12.6 |
| Handicraft | 8 | 0 | 5.3 |
| Total | 111 | 40 | 100.0 |

*Source:* ERIA SMEs survey in 2009.

### 4.2. Characteristics of SMEs

Table 3 shows the characteristics of SMEs by sector in terms of number of employees, ownership, profits, sales growth, sources of working capital, cost structure, source of intermediate inputs and products, and sales destination.

About 50% of firms were established after 2000, which shows that SMEs are still in the early stages of development. Domestic SMEs completely dominate all sectors, except for garments and parts/machinery, in which foreign firms account for about 20%. Most sectors have profits of more than 15% of total sales. Sales growth slowed down in

2008 because of the impact of the crisis; manufacturing and handicrafts were hit hardest. In all sectors retained earnings are the dominant source of working capital, accounting for more than 80% of total finance. This shows that most sectors face constrained financial access. Except for garments, wood processing and handicrafts, most products are sold domestically.

**Table 3. Characteristics of SMEs**

| | Garment | Parts/ machinery | Wood processing | Construction | Food/ beverage | Manufacture | Handicraft |
|---|---|---|---|---|---|---|---|
| Established since 2000(%) | 54.29 | 55.56 | 46.15 | 50 | 41.18 | 52.63 | 50 |
| Number of employment | 165 | 25 | 46 | 19 | 11 | 46 | 30 |
| Have staff training (%) | 27.3 | 14.3 | 0.0 | 11.8 | 3.4 | 18.8 | 37.5 |
| Ownership (%) | | | | | | | |
| Domestic | 72.0 | 73.3 | 93.8 | 95.0 | 94.8 | 90.5 | 79.5 |
| Foreign | 22.4 | 26.7 | 3.8 | 5.0 | 2.6 | 9.5 | 9.1 |
| Profit (%) | | | | | | | |
| '2007 | 14.9 | 18.7 | 21.0 | 17.0 | 17.9 | 15.7 | 17.4 |
| '2008 | 17.6 | 18.5 | 22.3 | 17.5 | 20.9 | 15.7 | 16.4 |
| Sale growth (%) | | | | | | | |
| '2007 | 15.4 | 12.3 | 12.0 | 10.6 | 10.7 | 20.3 | 19.4 |
| '2008 | 9.4 | 10.4 | 11.0 | 7.0 | 17.3 | 4.6 | -8.9 |
| Source of working capital (%) | | | | | | | |
| Retained earnings | 86.8 | 92.2 | 96.7 | 89.0 | 95.3 | 87.9 | 83.1 |
| Bank | 5.1 | 7.8 | 3.4 | 11.0 | 4.7 | 9.5 | 0.0 |
| Other financial institutions | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 |
| Others | 6.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.9 |
| Annual cost of interest (%) | 2.9 | 4.1 | 1.0 | 3.1 | 2.0 | 2.3 | 0.0 |
| Cost structure (2008) (%) | | | | | | | |
| Labor | 22.8 | 15.6 | 14.0 | 19.8 | 19.3 | 15.7 | 20.9 |
| Raw materials | 47.2 | 45.4 | 47.1 | 43.1 | 36.4 | 48.6 | 41.5 |
| Utility | 8.7 | 13.6 | 11.6 | 12.3 | 15.5 | 9.0 | 14.6 |
| Interest | 1.4 | 2.4 | 1.0 | 1.1 | 0.4 | 2.4 | 0.0 |
| Source of indemediate inputs (%) | | | | | | | |
| Domestic | | | | | | | |
| Import | 42.9 | 48.9 | 4.2 | 25.3 | 12.6 | 39.7 | 6.3 |
| Products sold (%) | | | | | | | |
| Domestic | 62.6 | 100.0 | 84.6 | 94.1 | 100.0 | 95.0 | 61.9 |
| Export | 37.4 | 0.0 | 15.4 | 5.9 | 0.0 | 5.0 | 38.1 |

*Source:* ERIA SMEs survey in 2009.

Table 4 illustrates business capacity: the firms' efforts to improve business processes or organizations, adopt new production methods, and introduce new goods to market in the past 3 years. The results show that different sectors varied in their ability to meet international standards. Only 6% of manufacturers have met an international standard. About 80% of the parts/machine sector bought new machines or facilities with new functions into operation; however, only about 30% of firms in the construction sector did so. Handicrafts, garments and wood processing introduced new products to market quite actively.

In sum, most sectors tried to improve their business processes, adopt new production methods, and introduce new products to market, but their business capacities are still limited.

**Table 4. Business Capacity**

| | Garment | Parts/ machinery | Wood processing | Construction | Food/ beverage | Manufacture | Handicraft |
|---|---|---|---|---|---|---|---|
| Met an international standard | 27.3 | 14.3 | 29.2 | 35.3 | 31.0 | 6.3 | 25.0 |
| Introduced ICT technologies | 45.5 | 28.6 | 16.7 | 35.3 | 3.5 | 37.5 | 28.4 |
| Established new divisions or new plants | 6.1 | 28.6 | 12.5 | 35.3 | 6.9 | 12.5 | 12.7 |
| Attended/involved in business associations, etc. | 48.5 | 28.6 | 33.3 | 23.5 | 17.2 | 12.5 | 32.1 |
| Bought new machines or facilities | 45.5 | 85.7 | 50.0 | 29.4 | 37.9 | 68.8 | 37.5 |
| Improved existing machines, equipment | 72.7 | 71.4 | 62.5 | 58.8 | 65.5 | 81.3 | 75.0 |
| Introduced new know-how | 48.5 | 57.1 | 62.5 | 58.8 | 34.5 | 37.5 | 62.5 |
| introduced new products or services to the market in past three year | 45.5 | 42.9 | 45.8 | 29.4 | 24.1 | 37.5 | 50.0 |
| to the new market | 60.0 | 33.3 | 72.7 | 40.0 | 42.9 | 83.3 | 25.0 |
| by using the new technologies | 60.0 | 66.7 | 81.8 | 100.0 | 71.4 | 16.7 | 50.0 |

*Source:* ERIA SMEs survey in 2009.

### 4.3. Perceptions of SME Barriers

In order to indentify the barriers facing SMEs, firm managers or owners were asked to rank a list of 38 barriers using a 5-point scale, which ranged from 1 (extremely significant) to 5 (not significant). The barriers were divided into 8 groups: (1) informational barriers; (2) functional barriers; (3) production and price barriers; (4)

distribution, logistics and promotion barriers, (5) procedural barriers; (6) business environment barriers; (7) tax, tariff and non-tariff barriers; (8) other barriers.

Table 5 shows the top-ten barriers across the 7 sectors. In terms of external barriers, SMEs identified a) Poor/deteriorating economic conditions in home market and b) High tax and tariff barriers in home market. The 2008 global financial crisis seems to have had a significant impact of SME performance in Laos. In terms of internal barriers, SMEs are facing logistics and distribution barriers such as the unavailability of inventories/warehousing facilities and excessive transportation/insurance cost. This indicates that poor logistic systems, and residing in a land-locked county, are the major barriers, a result which is consistent with the survey results from ADB-World Bank (2007).

The garment sector perceives external barriers such as poor/deteriorating economic conditions in home market, high tax and tariff barriers in home market, and poor/deteriorating economic condition in foreign markets as most important. The most important internal barriers are the shortage of working capital to finance new business plans and insufficient quality/untrained personnel for market expansion.

The parts/machine sector also perceives both external and internal barriers to running their business. In this sector the top-ranked barriers are the shortage of working capital to finance new business plans; poor/deteriorating economic conditions in home market; the difficulty in matching competitor prices; insufficient quantity/untrained personnel for market expansion; and offering competitive prices to customers.

In wood processing the top-ranked internal barriers are difficulties in matching competitor's prices; the shortage of working capital to finance new business plans; and offering competitive prices to customers. The top-ranked external barriers include poor/deteriorating economic condition in home market and the lack of home government assistance/incentives.

In the construction sector, the top-ranked internal barriers include offering competitive prices to customers; the lack of production capacity to expand; and the shortage of working capital to finance new business plans. The top-ranked external barriers consist of high tax and tariff barrier in home market; poor/deteriorating economic condition in home market; and excessive transportation/insurance cost.

The food/beverage sector perceives internal barriers as the most important. The top-ranked barriers include difficulties in matching competitor's prices; offering competitive prices to customers; and the shortage of working capital to finance new business plans.

In the manufacture sector, firms perceive internal barriers such as difficulties in matching competitor's prices and offering competitive prices to customers. They also perceive external barriers such as high tax and tariff barriers in home country.

Firms in the handicraft sector perceive internal barriers as most important. The top-ranked internal barriers include the shortage of working capital to finance new business plans; the lack of production capacity to expand; establishing and maintaining trust with business partners; and insufficient quantity/untrained personal for market expansion.

Table 6 shows the top 10 barriers faced by SMEs in- and outside production networks. SMEs outside production networks perceive both internal and external barriers. Internal barriers include offering competitive prices to customers; difficulty in matching competitors' prices; and the shortage of working capital to finance new business plans. The external barriers faced by SMEs outside production networks include poor/deteriorating economic conditions in the home market; high tax and tariff barriers in the home market; and the high costs of customs administration, in exporting or importing (home market).

## Table 5. Top Ten Barriers Facing SMEs, by Sector

| Rank | Overall | Garment | Parts/machinery | Wood process | Construction | Food/beverage | Manufacture | Handicraft |
|---|---|---|---|---|---|---|---|---|
| 1 | Poor/deteriorating economic conditions (a) Home Market) | Poor/deteriorating economic conditions (a) Home Market) | Shortage of working capital to finance new business plan | Difficulty in matching competitors' prices | Offering competitive prices to customers | Difficulty in matching competitors' prices | Difficulty in matching competitors' prices | Shortage of working capital to finance new business plan |
| 2 | High tax and tariff barriers (Home Market) | High tax and tariff barriers (Home Market) | Poor/deteriorating economic conditions (a) Home Market) | Poor/deteriorating economic conditions (a) Home Market) | High tax and tariff barriers (Home Market) | Offering competitive prices to customers | Offering competitive prices to customers | Lack of production capacity to expand |
| 3 | Unavailability of inventories/warehousing facilities | Shortage of working capital to finance new business plan | Difficulty in matching competitors' prices | Lack of home government assistance/incentives | Poor/deteriorating economic conditions (a) Home Market) | B35. Perceived risks in your current and new business operations | High tax and tariff barriers (Home Market) | Establishing and maintaining trust with business partners |
| 4 | Excessive transportation/insurance costs | Poor/deteriorating economic conditions (b) Foreign Market) | Insufficient quantity of and/or untrained personnel for market expansion | Shortage of working capital to finance new business plan | Lack of production capacity to expand | Shortage of working capital to finance new business plan | High costs of Customs administration, in exporting or importing (Home Market) | Lack of home government assistance/incentives |
| 5 | Restrictive health, safety and technical standards (Home Market) | Insufficient quantity of and/or untrained personnel for market expansion | Offering competitive prices to customers | Offering competitive prices to customers | Excessive transportation/insurance costs | Poor/deteriorating economic conditions (a) Home Market) | Poor/deteriorating economic conditions (a) Home Market) | Insufficient quantity of and/or untrained personnel for market expansion |
| 6 | Insufficient quantity of and/or untrained personnel for market expansion | Lack of home government assistance/incentives | Lack of managerial time to identify new business opportunities | B35. Perceived risks in your current and new business operations | Shortage of working capital to finance new business plan | High tax and tariff barriers (Home Market) | Excessive transportation/insurance costs | Offering competitive prices to customers |
| 7 | Inadequate property rights protection (Home Market) | Offering competitive prices to customers | Anti-competitive or informal practices | Anti-competitive or informal practices | High costs of Customs administration, in exporting or importing (Home Market) | High costs of Customs administration, in exporting or importing (Home Market) | Unreliable market data (costs, prices, market shares) | Difficulty in matching competitors' prices |
| 8 | Unreliable market data (costs, prices, market shares) | B35. Perceived risks in your current and new business operations | Lack of production capacity to expand | High tax and tariff barriers (Home Market) | Difficulty in matching competitors' prices | Limited Information to locate/analyze markets/business partners | Anti-competitive or informal practices | Poor/deteriorating economic conditions (b) Foreign Market) |
| 9 | B36. Lack of the perceived benefits from joining production networks | Anti-competitive or informal practices | Excessive transportation/insurance costs | Unfamiliarity with complexity of procedures/paperwork | Lack of home government assistance/incentives | Insufficient quantity of and/or untrained personnel for market expansion | Limited Information to locate/analyze markets/business partners | Limited Information to locate/analyze markets/business partners |
| 10 | Anti-competitive or informal practices | Lack of production capacity to expand | Inadequate property rights protection (Home Market) | Lack of production capacity to expand | Unfavourable home rules and regulations | B37. Willingness to adopt new business strategy or ideas | Inadequacy of basic and IT infrastructure (b) Foreign Market) | Developing new products |

*Source:* ERIA SMEs survey in 2009.

SMEs inside production networks tend to perceive external barriers rather than internal barriers as being most important. The top-ranked external barriers include lack of home government assistance/incentives; perceived risks in current and new business operations, poor/deteriorating economic conditions in the home market; and inadequate property rights protection (home market). This reflects the recent severe impact on their business resulting from the slowdown of economic activities in foreign and domestic markets due to the global financial crisis.

**Table 6. Top Ten Barriers Faced by SMEs, In- and Outside Production Networks**

| Rank | Production network | |
|---|---|---|
| | Out | In |
| 1 | Offering competitive prices to customers | Lack of home government assistance/incentives |
| 2 | Difficulty in matching competitors' prices | Difficulty in matching competitors' prices |
| 3 | Poor/deteriorating economic conditions(Home Market) | Perceived risks in your current and new business operations |
| 4 | High tax and tariff barriers (Home Market) | Shortage of working capital to finance new business plan |
| 5 | Shortage of working capital to finance new business plan | Poor/deteriorating economic conditions (Home Market) |
| 6 | High costs of customs administration, in exporting or importing (Home Market) | Inadequate property rights protection (Home Market) |
| 7 | Excessive transportation/insurance costs | Willingness to adopt new business strategy or ideas |
| 8 | Insufficient quantity of and/or untrained personnel for market expansion | Lack of production capacity to expand |
| 9 | Anti-competitive or informal practices | High tax and tariff barriers (Home Market) |
| 10 | Lack of production capacity to expand | Offering competitive prices to customers |

*Source:* ERIA SMEs survey in 2009.

In addition, firms also simultaneously ranked all 8 barrier types from 1 (extremely important) to 8 (least important). These results are shown in Table 7. The top 3 barrier types are (1) production and price barriers; (2) distribution, logistics and promotion barriers; and (3) business environment barriers. These results reflect poor logistic systems and deteriorating economic conditions due to the global financial crisis. They

also demonstrate that SMEs lack capacities and competitiveness in production and price competition. As Laos will access to the World Trade Organization (WTO) soon, it is vital for policy makers to increase the capacities and competitiveness of SMEs.

For SMEs inside production networks, the top-three barrier types are (1) production and price barriers; (2) business environment barriers; and (3) distribution, logistics and promotion barriers. For SMEs outside production networks, the top-three barrier types are (1) production and price barriers; (2) distribution, logistics and promotion barriers; and (3) business environment barriers.

**Table 7. Ranked Barrier Types, by In/Out Production Network**

| Rank | Overall SMEs | Production network | |
|---|---|---|---|
| | | Out | In |
| 1 | Production and price barriers | Production and price barriers | Production and price barriers |
| 2 | Distribution, logistics and promotion barriers | Distribution, logistics and promotion barriers | Business environment barriers |
| 3 | Business environment barriers | Business environment barriers | Distribution, logistics and promotion barriers |
| 4 | Functional barriers | Functional barriers | Functional barriers |
| 5 | Procedural barriers | Tax, tariff and non tariff barriers | Procedural barriers |
| 6 | Tax, tariff and non tariff barriers | Procedural barriers | Information barriers |
| 7 | Information barriers | Information barriers | Tax, tariff and non tariff barriers |

*Source:* ERIA SMEs survey in 2009.

## 5. Characteristics of SMEs in Production Networks

In order to promote SMEs in ASEAN production networks, the characteristics of SMEs in- and outside production networks are identified. The results are shown in Table 8. Firms involved in production networks are likely to (1) be in the garment sector; (2) have a high share of foreign investors; (3) have high growth of sales; and (4) have high abilities in accessing finance sources such as banks and other financial institution.

Table 9 shows business abilities in-and outside production networks. It is clear that SMEs in production networks have made efforts to improve business processes or

organization and have also adopted new production methods in the past 3 years. SMEs in production networks are characterized by the following business abilities: (1) have met an international standard; (2) have established new divisions or new plants (3) have attended/been involved in business associations; (4) have improved existing machines, equipment; and (5) have introduced new products or services to the market.

In sum, the SMEs in production networks have strong business capacities in terms of improving business processes and adopting new technology. Foreign investor share also plays an important role in allowing SMEs to join the networks. SMEs in networks seem to have the ability to access financial sources from banks and other financial institutions. Lastly, SMEs in production networks perform well. On the other hand, it is quite difficult to say that firm size in term of sales and employment, or the firm's age is key determinants for participation in a production network.

**Table 8. Characteristics of SMEs In- and Outside Production Networks.**

| Number of employment | Production network | |
|---|---|---|
| | Out | In |
| | 65.1 | 46.0 |
| Type of firms | | |
| Garment | 18.9 | 35.0 |
| Parts, components/electrical,parts | 7.2 | 2.5 |
| Wood process | 15.3 | 22.5 |
| Construction | 14.4 | 10.0 |
| Food/drink | 22.5 | 22.5 |
| Manufacture | 14.4 | 7.5 |
| Handicraft | 7.2 | 0.0 |
| Ownership | | |
| Domestic | 88.5 | 81.5 |
| Foreign | 9.3 | 13.3 |
| Profit (%) | | |
| '2007 | 17.5 | 16.8 |
| '2008 | 18.7 | 19.3 |
| Sale growth (2007) | 13.1 | 15.5 |
| Cost structure (2007) | | |
| Labor | 19.8 | 15.7 |
| Raw materials | 42.9 | 51.4 |
| Utility | 12.0 | 11.2 |
| Interest | 1.4 | 0.9 |
| Others | 6.4 | 3.9 |
| Source of working capital | | |
| Retained earnings | 91.1 | 90.8 |
| Bank | 6.6 | 4.3 |
| Other financial institutions | 0.0 | 2.9 |
| Others | 2.4 | 2.1 |
| Source of expansion capital | | |
| Retained earnings | 96.3 | 87.1 |
| Bank | 0.8 | 6.5 |
| Other financial institutions | 0.0 | 2.8 |
| Others | 2.9 | 3.6 |

*Source:* ERIA SMEs survey in 2009.

**Table 9. Business Capacity In- and Outside Production Networks**

| | Production network | |
|---|---|---|
| | Out | In |
| Met an international standard | 18.9 | 50.0 |
| Introduced ICT technologies | 27.9 | 27.5 |
| Established new divisions or new plants | 9.0 | 22.5 |
| Attended/involved in business associations, etc. | 27.0 | 42.5 |
| Bought new machines or facilities | 49.6 | 40.0 |
| Improved existing machines, equipment | 63.1 | 72.5 |
| Introduced new know-how | 46.9 | 55.0 |
| introduced new products or services to the market in past three year | 33.33 | 45.00 |
| to the new market | 43.24 | 83.33 |
| by using new technologies | 51.35 | 100 |
| The average percentage increase in sales | 20.2 | 24.4 |

*Source:* ERIA SMEs survey in 2009.

## 6. Assessment of Current Government Assistance

As Lao SMEs are in the early stages of development, government and international agencies have implemented some programs to support SMEs. In order to make this support more effective, it is important to examine the adequacy of these programs. The survey divided all support and assistance into 8 categories: (1) training; (2) counseling and advice; (3) technology development and transfer; (4) information; (5) business linkage and networking; (6) financing; (7) overall improvement in investment climate; (8) others. First, firms were asked whether they received support and assistance from the government or NGOs. Secondly, if they received support and assistance, they were asked to rate the effectiveness of programs in each category from 1 (extremely effective) to 5 (least effective).

In general, SMEs seem to have received little support and assistance from the government or NGOs. Overall, about 20% of SMEs receive some form of assistance. Among the 8 categories, the lowest-ranked forms of support and assistance received

from the government and NGOs were: (1) Financing; (2) Technology development and transfer; and (3) Business linkages and networking. SMEs inproduction networks seem to have more support and assistance from the government and NGOs. About 30% of SMEs inproduction networks have received assistance from the government or NGOs and others but only 20% of SMEs not in production networks have received assistance. In particular, support and assistance in market information and business linkages and networking for SMEs in production networks seem higher than for SMEs outside the networks. These results confirm the benefits of participating in production networks.

In terms of the effectiveness of support programs, these forms of assistance seem to be effective for SMEs both in-and outside networks, except for financing support (Table 11). SMEs in production networks are less satisfied with their financing support.

**Table 10. Assistance from Government, NGOs**

(%)

| | Production network | | Overall |
|---|---|---|---|
| | Out | In | |
| Training in general | 31.5 | 45.0 | 35.1 |
| Counseling and advice | 40.5 | 45.0 | 41.7 |
| Technology development and transfer | 20.7 | 25.0 | 21.9 |
| Market information | 22.5 | 40.0 | 27.2 |
| Business linkages and networking | 20.7 | 37.5 | 25.2 |
| Financing | 20.7 | 22.5 | 21.2 |
| Overall improvement in investment climate | 27.9 | 20.0 | 25.8 |
| Others | 8.1 | 2.5 | 6.6 |

*Source:* ERIA SMEs survey in 2009.

**Table 11. Adequacy of Assistance**

| | Production network | | Overall |
|---|---|---|---|
| | Out | In | |
| Training in general | 1.9 | 2.5 | 2.2 |
| Counseling and advice | 2.1 | 2.3 | 2.2 |
| Technology development and transfer | 2.6 | 1.7 | 2.1 |
| Market information | 2.5 | 2.7 | 2.6 |
| Business linkages and networking | 2.5 | 2.8 | 2.6 |
| Financing | 2.8 | 3.5 | 3.1 |
| Overall improvement in investment climate | 2.4 | 2.7 | 2.5 |

*Source:* ERIA SMEs survey in 2009.

In addition, the firms were also asked to rank all eight forms of assistance to SMEs from 1 (most important) to 8 (least important). The results are shown in table 12.

Overall SMEs perceived that financing support was the most important for them and SMEs both in- and outside production networks gave the same result.

The main reasons for financial constraints are: (1) Financial system is still at early stages of development, most banks are state-owned, and some of them experienced large amounts of non-performing loans (NPL) in the past (Kyophilavong, 2007). Therefore, most of state-owned commercial banks have little incentive to provide credit to SMEs; (2) most of the owners of SMEs have elementary education; loan procedures in banks are quite complicated for them. Therefore, it is quite difficult for them to access banks; (3) The government still does not have a financial support program for SMEs. Recently however, the banking sector has been reformed and private and foreign banks have increased in number. Some of the banks have targeted SMEs. In addition, government has also planned to set up an SMEs Fund. This indicates that SMEs may have better opportunities to access finance sources now, as compared with the past.

**Table 12. Ranked Perception of Assistance**

| Rank | Overall SMEs | Production network | |
|---|---|---|---|
| | | Out | In |
| 1 | Financing | Financing | Financing |
| 2 | Counseling and advice | Training | Business linkages and networking's |
| 3 | Overall improvement in investment climate | Counseling and advice | Overall improvement in investment climate |
| 4 | Training | Overall improvement in investment climate | Counseling and advice |
| 5 | Business linkages and networking's | Technology development and transfer | Training |
| 6 | Technology development and transfer | Business linkages and networking's | Technology development and transfer |
| 7 | Information | Information | Information |
| 8 | Others | Others | Others |

*Source:* ERIA SMEs survey in 2009.

# 7. Factors Affecting Firm Productivity and Production Networks

## 7.1. Factors Affecting Firm Productivity

The Cobb-Douglas production function is used for estimating the factors affecting labor productivity. The Cobb-Douglas production function is defined as follows:

$$Y_{it} = A * K_{it}^{\alpha} L_{it}^{\beta} e^{X_{it}} \quad (1\text{-}1)$$

A is a constant term, Yit, Kit, and Lit are total output, capital and labor for firm i at time t and Xit is a group of possible factors, which many affect labor productivity respectively. $\alpha$ , $\beta$ are coefficients of the production that is assumed to be constant across firms. Dividing both sides by Lit t equation (1-1) can be rewritten as:

$$\frac{Y_{it}}{L_{it}} = A \left( \frac{K_{it}}{L_{it}} \right)^{\alpha} (L_{it})^{\alpha+\beta-1} e^{Xit} \quad (1\text{-}2)$$

Taking the logarithm of both sides of equation (1-2), the equation becomes:

$$Ln\left( \frac{Y_{it}}{L_{it}} \right) = Ln(A) + \alpha * Ln(\frac{K_{it}}{L_{it}}) + (\alpha + \beta - 1) Ln(L_{it}) + X_{it} \quad (1\text{-}3)$$

According to Solow (1956), there are many factors affecting total factor productivity (TFP) such as technological progress, research activity, human capital, trade, a firm's age and size, ownership and other unobservable factors. Therefore, Xit can be written as another functional form as follows.

Xit= f (lq6emp, group2, group3, group5, q5for, fin1, fin2, fin3, ipn1,
q11bp1, q11bp2, q11bp3, q11bp4, q14r1, q14r2, q14r3, q14r4,
q14r5, q14r6, q14r7) (1-4)

A detailed explanation of variables is shown in Table 13.

**Table 13. Variables for Regression**

| Symbol | Explaination | Value |
|---|---|---|
| lq6emp | Total employment | person |
| group2 | Human resources investment | yes=1, other=0 |
| group3 | Tertiary educhtion | yes=1, other=0 |
| group5 | Domestic firm | yes=1, other=0 |
| q5for | Foreign firm | yes=1, other=0 |
| fin1 | Retained earnings | % |
| fin2 | Bank | % |
| fin3 | Other financial institution | % |
| ipn1 | In-production network | yes=1, other=0 |
| q11bp1 | Met an international standard | yes=1, other=0 |
| q11bp2 | Introduced ICT | yes=1, other=0 |
| q11bp3 | Established new divisions or new plants | yes=1, other=0 |
| q11bp4 | Attended in business association | yes=1, other=0 |
| q14r1 | Information barriers | Rank from 1 to 8 |
| q14r2 | Functional barriers | Rank from 1 to 9 |
| q14r3 | Production and price barriers | Rank from 1 to 10 |
| q14r4 | Distribution, logistic barriers | Rank from 1 to 11 |
| q14r5 | Producedural barriers | Rank from 1 to 12 |
| q14r6 | Business environment barriers | Rank from 1 to 13 |
| q14r7 | Tax, tariff and non-tariff barriers | Rank from 1 to 14 |

*Source:* Author.

We used the Ordinary Least Square (OLS) method. In order to avoid multicollinearity in the independent variables, the correlation matrix method was employed. We chose variables which had correlations of less than 50%. We estimated labor production functions in order to investigate the impact of various variables on labor productivity. The results are explained below.

The adjusted $R^2$ of this model was 0.63%, showing the model fitted well. The Breusch-Pagan test indicated that there was no heteroscedascticity. Foreign firm (q5for) and introduced ICT (q11bp2) were found to be statistically positively significant with the expected signs for labor productivity. On the other hand, Business environment barriers (q14r6) and number of employment (q6emp) were found to be statistically negatively significant on labor productivity. However, in-production network (ipn1) was found to be not statistically significant on labor productivity.

**Table 14. Factors Affecting Labor Productivity**

| Symbol | Coefficient | t value |
|---|---|---|
| lq6emp | -0.28* | -2.23* |
| group2 | 0.34 | 0.70 |
| group3 | 0.39 | 1.01 |
| group5 | 0.79 | 0.94 |
| q5for | 0.01*** | 1.77 |
| fin1 | 0.54 | 0.40 |
| fin2 | 0.17 | 0.42 |
| fin3 | 0.30 | -0.24 |
| ipn1 | 0.18 | 0.53 |
| q11bp1 | 0.13 | 0.37 |
| q11bp2 | 0.76*** | 1.72 |
| q11bp3 | -0.37 | -0.80 |
| q11bp4 | 0.16 | 0.48 |
| q14r1 | 0.06 | 0.67 |
| q14r2 | -0.13 | -1.20 |
| q14r3 | 0.02 | 0.18 |
| q14r4 | -0.06 | -0.59 |
| q14r5 | -0.15 | -1.37 |
| q14r6 | -0.23* | -2.37 |
| q14r7 | 0.09 | -1.04 |
| _cons | 9.64 | 3.46 |
| Sample | 151 | |
| R-squared | 0.207 | |
| Prob > F | 0.099 | |

Source: Author's estimation.
Note:* denotes statistical significance at 1% level.
** denotes statistical significance at 5% level.
*** denotes statistical significance at 20% level.

### 7.2. Determinants of factors affecting SME production networks

In this section, we identify the factors affect SME in-outside production network using logit model. Here, we define networking according to Narjoko and Oum (2009).

In order to assess the factors that influence production networks, the logit model is used. This model is particularly suited to the task at hand because it is designed to handle regressions involving dichotomous dependent variables. This consideration is singularly important since business owners were asked to say whether their product is exportable or not. These responses, coded 1 for export and coded 0 for other, is called the dependent variable. The explanatory variables describe various attributes of type of establishment, type, size and etc (for more details see Table 19).

Theoretically, a logit model assumes the form of a logistic function in which the probability *p* of one outcome is given as:

$$p = \frac{e^{a+b_1X_1+...+b_nX_n}}{1+e^{a+b_1X_1+...+b_nX_n}} \tag{2-1}$$

where *a* is *a* constant, $X_1 + \ldots + X_n$ are the independent variables, $b_1 + \ldots + b_n$ are parameters of coefficients, and "e" is the natural logarithm 2.71828. The alternative outcome, the probability of performance of establishment, is given as:

$$1 - p = \frac{1}{1+e^{a+b_1X_1+...+b_nX_n}} \tag{2-2}$$

Therefore, the odds ratio in trend of established performance are:

$$p/(1-p) = e^{a+b_1X_1+...+b_nX_n} \tag{2-3}$$

The logistic function in equation (2-3) represents an S-shaped curve ranging from 0 through 1 with points of inflection occurring at y = 0.5. Within this function p/(1-p) is non-linearly related to the independent variables. Also, as the independent variables range from negative infinity to positive infinity, p/(1-p) can only take on values ranging between 0 and 1, a situation that makes the model untenable for estimation using the Ordinary Least Square method (Styles and Peterson 1984). By means of a logit transformation, the non-linear function can be converted into an unbounded linear one L, in which L can take on any value greater than 0 while, at the same time, its probabilities remain free to range between 0 and 1. This conversion is done by taking the natural logs of both sides. Thus:

$$L = \ln(p/1-p) = a + b_1X_1 + ... + b_nX_n \tag{2-4}$$

The predicted frequencies "L" are log odds or "logits". The logits are linearly related to the independent variables and, at the same time, their probability of occurrences is restricted to the range (0, 1). Estimates of the parameters $b_1 + \ldots + b_n$ can be used to calculate magnitude and direction of marginal effects. The logit model used in this study assumed the form shown in equation 2-4.

$$\ln(P_i / 1 - P_i) = B_1 + B_2 X_1 + B_3 X_2 + B_4 X_3 + B_5 X_4 + B_6 X_5 + B_7 X_6 + e_i \qquad (2\text{-}5)$$

Based on the above Logit model, we could identify the factors that affect production networks. The definition of variables in model is shown in Table 15.

**Table 15. Definitions of variables for model**

| Symbol | Explaination | Value |
|---|---|---|
| X1 | Total sale | US$ |
| X2 | Total employment | Person |
| X3 | Human resources investment | yes=1, other=0 |
| X4 | Tertiary educhtion | yes=1, other=0 |
| X5 | Domestic firm | yes=1, other=0 |
| X6 | Foreign firm | yes=1, other=0 |
| X7 | Bank | Pecent of capital |
| X8 | Met an international standard | yes=1, other=0 |
| X9 | Established new divisions or new plants | yes=1, other=0 |
| X10 | Attended in business association | yes=1, other=0 |
| X11 | Information barriers | Rank from 1 to 8 |
| X12 | Functional barriers | Rank from 1 to 8 |
| X13 | Production and price barriers | Rank from 1 to 8 |
| X14 | Distribution, logistic barriers | Rank from 1 to 8 |
| X15 | Producedural barriers | Rank from 1 to 8 |
| X16 | Business environment barriers | Rank from 1 to 8 |
| X17 | Tax, tariff and non-tariff barriers | Rank from 1 to 8 |

*Source:* Author.

**Table 16. Result of Logit Model**

| Symbol | Coefficient | z value |
|---|---|---|
| X1 | 0.00 | 1.08 |
| X2 | -0.004 | -1.42 |
| X3 | -1.14 | -1.32 |
| X4 | 1.63* | 2.53 |
| X5 | -1.74 | -0.93 |
| X6 | -0.01 | -0.63 |
| X7 | 0.033 | 0.49 |
| X8 | 1.70* | 2.99 |
| X9 | 1.61* | 2.13 |
| X10 | 0.83 | 1.47 |
| X11 | -0.04 | -0.3 |
| X12 | -0.02 | -0.16 |
| X13 | -0.36* | -2.02 |
| X14 | 0.28 | 1.57 |
| X15 | -0.007 | -0.04 |
| X16 | 0.03 | 0.19 |
| X17 | 0.07 | -0.51 |
| cons | 0.16 | 0.04 |
| obs | 147 | |
| LR chi2(19) | 38.34 | |
| Prob > chi2 | 0.01 | |
| Log likelihood | -64.84 | |
| Pseudo R2 | 0.23 | |

Source: Author's estimation.
Note:* denotes statistical significance at 1% level.
** denotes statistical significance at 5% level.
*** denotes statistical significance at 10% level.

## 8. Conclusion and Policy Recommendations

Economic integration in the region provides opportunities for SMEs to participate in the ASEAN production networks, and joining production networks could increase the competitiveness of SMEs. Therefore, the government has given high priority to promoting membership by Lao SMEs of business networks in ASEAN. The main objective of this study is to gain better understanding of the characteristics of, and barriers facing Lao SMEs so that they can participate effectively in production networks. From the analysis of the results, the preliminary conclusions are as follows.

Even though Lao SMEs have performed quite well recently, with total average profits of about 18%, they are facing financial constraints and only a small portion of SMEs have received financing from banks and other financial institutions.

Some SMEs have improved their businesses and adopted new production methods, but only a small portion. In terms of internal barriers, a shortage of working capital is top ranked, followed by the difficulty of matching competitors' prices. In terms of external barriers, lack of government assistance/incentives and poor economic conditions in home market are top ranked. Production and price barriers are ranked as the most important barriers.

Lao SME participation in production networks in Asia is still in the early stages of development. The main features of SMEs participating in production networks are strong business capacities, high share of foreign investment, and the ability to access financial sources.

Lao SMEs are facing various issues such as a shortage of working capital, difficulty matching competitor's prices, lack of government assistance/incentives and poor economic conditions. Therefore, it is crucial to solve these issues in order to enhance Lao SME participation in production networks in Asia. In order to promote production networks, it is especially important to address is the shortage of working capital, as well as to improve SMEs to meet international standards.

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## Appendix 1. Comparison of Lao Resource Sectors with Other Countries

| Country | Resource export | | Resource fiscal revenue | | Per capita GDP (in US dollars) | Commodity |
|---|---|---|---|---|---|---|
| | In percent of total export | In percent of GDP | In percent of total fiscal revenue | In percent of GDP | | |
| Low-income countries | | | | | | |
| Lao P.D. R | 37.4 | 9.1 | 3.7 | 0.4 | 501 | Copper and gold |
| Mongolia | 61.5 | 35.8 | 20.8 | 8.4 | 847 | Copper and gold |
| Papua New Guinea | 75.3 | 66.2 | 31.3 | 8.8 | 666 | Oil, gas, copper and gold |
| Timor-Leste | - | 109.2 | 79.8 | 72.4 | 353 | Oil and gas |
| Vietnam | 22.5 | 14.5 | 33.3 | 9 | 639 | Oil and gas |
| High-and middle-income countries | | | | | | |
| Australia | 46.2 | 9 | - | - | 34381 | - |
| Brunei | 85.3 | 62 | 91.6 | 45.2 | 25976 | - |
| Indonesia | 23.1 | 6.8 | 28 | 5.2 | 1353 | - |
| Malaysia | 8.1 | 8.8 | 29.7 | 6.5 | 5126 | - |
| Total regional average | 18.5 | 7.3 | 29.4 | 6.3 | 2054 | - |
| Low-income country average | 22.9 | 14.7 | 32 | 9 | 608 | - |

Source: IMF (2007).