LaoGEM:

A General Equilibrium Model of the Lao Economy*

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This paper describes *LaoGEM* (Lao General Equilibrium Model), a 20 sector, 400 household general equilibrium model of the Lao economy, constructed specifically for the analysis of the effect of road improvement on rural poverty incidence in Laos. Unless otherwise stated, the database of the model refers to the year 2002. These features are relatively standard for comparative static general equilibrium models, except for the treatment of the household sector.

Three features are important. First, the model distinguishes four categories of households, one urban and three rural, the latter differentiated by the quality of roads which service the villages in which these rural households are located. Second, each of these four categories of households contains 100 household sub-categories, arranged by real expenditures per household member. Third, the three rural household categories differ according to the transport costs that they face, commensurate with the quality of roads servicing them, and using information on transport costs.

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1. Introduction

Lao PDR (subsequently Laos, for brevity) is a poor, landlocked and mountainous country and many rural areas suffer from badly maintained or even non-existent roads. The poorest people often live far from urban market centers and these people are consequently the most disadvantaged by the high transport costs resulting from bad roads. Over the past two decades Laos has made considerable progress in reforming legal and administrative obstacles to market-based development. But for people facing very high transport costs arising from inadequate roads, these reforms may be of limited value. For them, markets cannot be accessed anyway, except at very high cost. Bad roads undermine the benefits available from market-based economic reform.

2. Road Quality and Transport Costs

The road system of Laos, extending just over 31,000 kilometers, is mostly in disrepair. Putting aside urban and purpose-built special roads, the road network consists of national and local roads, with the latter subdivided into provincial, district and rural roads. Less than 20 percent of this total network is paved. The national roads, linking major towns and provincial capitals and providing connections to neighboring countries, total about 3,700 kilometers, or about 23 percent of the road network. Due to substantial investments by the Lao government and foreign donors over the last decade and a half, about half of this national road network is now paved, with the remainder having gravel or earth surfaces. Although this is a significant improvement in road quality, only about half of the best segment of the overall road network – the national roads – can be relied upon to provide all weather connectivity.

Local roads run about 21,700 kilometers in length and make up about 70 percent of the entire network, but only about 4 percent is paved. The provincial road network is about 6,500 kilometers in length, of which even less is paved (3 percent). District roads are about 6,500 kilometers and are almost equally divided into either gravel or earth surfaces. Rural roads are the most important category in the network, extending more than 11,000 kilometers. Hardly any of it is paved, and almost 85 percent is earth. In consequence, almost the entire local road network of Laos may be impassable during at least some of the wet season.

The cost of land transport in Laos is relatively high, and might be reduced significantly by improving the existing network and expanding it, especially in rural areas. Motorized vehicles are the dominant mode of transport, carrying 91 per cent of total freight ton-kilometers and 95 per cent of total passenger-kilometers. The small share of the network that is paved is in generally good condition, given that most was only recently upgraded, but this is not true of non-paved surfaces. World Bank (2001) estimated that about 60 percent of the District and Rural road network is in either "poor" or "bad" condition. A more recent study, Government of Lao PDR (2004), suggested that little had changed since the World Bank study and that only 38 percent of the total local road network was in a "maintainable" condition.

In this study, three types of road quality are distinguished: (i) no vehicular access; (ii) dry season only access; and (iii) all weather access. No vehicular access means that the pathways through which the village is normally reached cannot accommodate conventional motorized vehicles. It does not mean that the village is completely isolated. It may still be accessible by low-cost vehicles and carrying devices appropriate to local-level transport tasks. The latter include simple devices to facilitate the carrying of loads by people, such as the shoulder pole and the backpack frame; human-powered vehicles such as wheelbarrows, handcarts and bicycles; animal-powered devices such as donkeys with panniers, and animal drawn carts and sledges; and perhaps some two-wheeled motorized vehicles such as mopeds and motorcycles.

Dry season only access roads consist predominantly of unpaved roads that are accessible to conventional motorized vehicles during the dry season but not necessarily during the wet season. Depending on weather conditions, this covers most, but not all, earth and gravel road surfaces. During the wet season vehicles are forced to find alternative routes or paths alongside the existing road that enable passage but result in higher transport costs due to the necessity to use smaller, less efficient vehicles, including motorcycles, and due also to changes in travel distance, road roughness, and speeds.

Finally, conventional motorized vehicles can use all weather access roads during the dry and wet seasons. These roads are not subject to closure as a result of flooding during the wet season. This category includes almost all paved roads.

The Lao Expenditure and Consumption Survey (LECS), which has now been conducted for 1992-93 (LECS 1), 1997-98 (LECS 2) and 2002-03 (LECS 3), provides, in the case of LECS 2 and LESC 3, a comparable classification of roads into these categories, and records the category of road servicing each village. Table 1 summarises the importance of these three categories of rural villages, classified by road access. One point that emerges from this table is that over the five year interval between these two surveys there was a decline in the proportion of rural households living in villages with “dry season access only” road access and a corresponding increase in the proportion with “all season access”. But there was no change in the proportion having “no access any season”. The road improvement that occurred consisted overwhelmingly of upgrading “dry season access only” roads to all weather roads. No upgrading of “no access any season” roads can be detected from these data. In 2002-03 almost one third of all rural households lived in villages without roads that support four-wheel vehicle access.

Table 1

The socio-economic characteristics of rural households living in these three types of villages are quite different. Table 2 summarizes some information on these differences, based on the LECS 3 survey for 2002-03. Villages without road access have lower mean consumption expenditures per person and higher rates of poverty incidence than households with dry season access only, which are in turn less well off by both measures than villages with all weather access. Other socio-economic indicators, relating to education and health, also support the importance of road access for the well being of rural people. Areas with poorer roads have lower rates of school attendance for both male and female children, lower per capita expenditures on education, higher rates of sickness and lower likelihood of seeking treatment when they are ill.

Table 2

Road improvement presumably reduces transport costs, but by how much, and to what extent does this depend on the form of road improvement concerned? Two forms of road upgrading are relevant for rural Laos: (a) the conversion of dry season only access roads to all weather access roads; and (b) creating dry season access roads where no road access previously existed.

Project performance evaluation reports on road improvement projects financed by multilateral development agencies often include estimates of transport costs. They are generally based on vehicle operating costs (VOCs) before and after the project concerned. The projects are nearly always of type (a) above, rather than (b). A recent such report relating to a road project in Champassak Province in Laos (Asian Development Bank 2003), reports vehicle operating cost (VOC) estimates based mainly on road roughness as measured by the international roughness index (IRI).[1] According to this study, VOCs are twice as high on dry season only access roads as on all weather access roads.[2] Estimates of travel times associated with all weather and dry season access roads are also presented, based on discussions with government officials and local villagers. Average reductions in travel time associated with the conversion of dry season access roads to all weather roads were estimated at 40 to 50 per cent, consistent with the estimates of VOCs.

A number of international studies report similar findings. Minten and Kyle (1999) analyze the causes of food price variation in Zaire using survey data collected from itinerant traders. They find that transportation costs were on average twice as high on dirt roads as on paved roads. A study by Levy (1996) on the impact of converting dry season access to all season access roads in Morocco found that travel times were typically cut by around 50 percent. Other studies focusing on the link between infrastructure and trade such as Limao and Venables (2001) report reductions in transport costs of similar magnitudes.

Identifying transport costs for the no vehicular access case is difficult. This is a residual category and the surfaces that belong to it can vary greatly. A study by Starkey (2001) suggests a possible indirect approach, using estimates VOCs for

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[1] For useful discussions of the computation of VOCs, and the relationship with the IRI, see Archondo-Callao (1999) and Dawson et al. (1993).

[2] The reductions in VOCs reported in this study are generally consistent with other estimates for Laos. For example, World Bank (2005, Table 4) reports average reductions in road user costs of about 44 percent, in moving from dry season access to all weather access roads.

different types of vehicle used. Transport costs for no road access areas, dry season access and all weather access roads can be identified with the VOC for motorcycles, pickups and trucks, respectively. Motorcycles are the least cost means of transport when no vehicular access exists. Pickups are efficient on dirt roads and can be used for most of the year. Trucks carry heavier loads than pickups, and require a better surface.

Starkey estimates the relative VOCs per tonne per kilometer traveled for transport via motorcycles, pickups and trucks at 1.104, 0.386 and 0.192, respectively. Only the relative magnitudes are of concern here, rather than the absolute units. Relative to the VOC per tonne per kilometer for all weather roads, the VOC for dry season access roads is thus estimated at 2.01 (almost identical to the estimate derived from Asian Development Bank (2003)) and for no road access it is 5.75. These estimates will form the basis for the transport cost simulations reported below.

3. Model structure

The theoretical structure of *LaoGEM* is relatively conventional. It belongs to the class of general equilibrium models that are linear in proportional changes, sometimes referred to as Johansen models. The highly influential *ORANI* general equilibrium model of the Australian economy (Dixon, *et al.* 1982) also used this approach. The detailed structure of *LaoGEM* is based on the *PARA* and *Wayang* general equilibrium models of the Thai and Indonesian economies, respectively, described in detail in Warr (2001) and Warr (2005), respectively. The structure also draws on elements of a revised version of the *ORANI* model of the Australian economy called *ORANI-G* (Horridge 2004). However, this general structure is adapted to reflect important features of the Lao economy.

The microeconomic behaviour assumed within *LaoGEM* is competitive profit maximisation on the part of all firms and competitive utility maximisation on the part of consumers. Each industry has a constant returns to scale technology and there is at least one industry-specific factor present in each industry. In the simulations reported in this paper, the markets for final outputs, intermediate goods and factors of production are all assumed to clear at prices that are determined endogenously within the model.[3] The nominal exchange rate between the Lao *kip* and the US dollar is fixed exogenously and its role within the model is to determine, along with international prices, the nominal domestic price level. The model is homogeneous (degree one for prices and degree zero for quantities) with respect to this exchange rate. This means that because domestic prices adjust flexibly to clear markets, a 1 percent increase in the kip/dollar exchange rate will result in a 1 percent increase in all nominal domestic prices, leaving all real variables unchanged.

4. Industries

The model contains 20 industries, listed in Appendix Table 1. They include three agricultural industries: crops; livestock and poultry; forestry and logging. Non-agricultural industries include: mining and quarrying; seven manufacturing industries; and nine services and utilities industries, one of which is transport. The transport industry will be important for the present study. Each industry produces a single output, and the set of commodities therefore coincides with the set of industries. Exports are not identical with domestically sold commodities. In each industry the two are produced by a transformation process with a constant elasticity of

[3] Variations to this assumption are possible. For example, the possibility of unemployment can be introduced by varying the closure to make either real or nominal wages exogenous, thereby allowing

transformation.

The core of the production side of the model is a 20 sector input-output table for Laos, estimated especially for this study. No input-output table is currently available for Laos and the table constructed for the present study is thus the first publicly available input-output table for the country. It is based on information from two sources. First, there is a 20 sector input-output table for Savannaket Province of Laos, relating to the year 2003, recently constructed in a detailed study by researchers at the Asian Development Bank (Secretario, *et al.* 2005)**.** This table is then adjusted using data from the Lao National Accounts for 2002. The method of adjustment may be understood as follows. The value added totals for the various sectors of the Savannaket table are compared with those for Laos, derived from the National Accounts. The Savannaket table is then amended using a method called RAS (row and column sum) to force the value added totals to match those for Laos.

The resulting table has a structure that reflects the industry structure of Laos, as reflected in its National Accounts, but within each industry the input-output technology reflects that of Savannaket Province. The method thus assumes that the input-output technology for each industry in Laos is similar to that of Savannaket, even though the relative importance of these various industries in Laos is quite different from that of Savannaket. Fortuitously, Savannaket Province seems a suitable basis for this kind of exercise in that it is roughly intermediate within the provinces of Laos in terms of its level of technology, neither the most nor the least advanced. The resulting table seems to make sense. When a properly constructed input-output table for Laos becomes available, it should presumably replace the table constructed as above. In the meantime, this table is considered the best available. The cost structures

the level of employment to be endogenously determined by demand.

of these 20 industries, derived from this estimated IO Table, are summarized in Appendix Table 2 and their sales structures are summarized in Appendix Table 3.

5. Commodities

Although the sets of producer goods and consumer goods have the same names, the commodities themselves are not identical. Each of the 20 consumed goods consists of a composite of the domestically produced and imported version of the same commodity, where the two are imperfect substitutes. The proportions in which they are combined reflect consumer choices and depend on both (a) the relative prices of these imported and domestically produced versions of the good and (b) the (Armington) elasticity of substitution between them.

6. Factors of production

The mobility of factors of production is a critical feature of any general equilibrium system, where the term 'mobility' here means the capacity to move across economic activities (industries), and not necessarily the capacity to move geographically. The greater the inter-sectoral factor mobility that is built into the model, the greater is the flexibility of the economy, as reflected in its simulated capacity to respond to changes in the economic environment. It is clearly essential that assumptions about the mobility of factors of production be consistent with the length of run that the model is intended to capture.

Labor is assumed to be fully mobile across all sectors, implying that wages must be equal in all sectors, and must move together. There are three kinds of capital: capital that is immobile across industries but mobile within industries, referred to subsequently as fixed capital; capital that is mobile among agricultural industries but not mobile between agriculture and the non-agricultural industries, referred to as agricultural mobile capital; and capital that is mobile among the non-agricultural industries but not between them and the agricultural industries, referred to here as non-agricultural mobile capital.

In this treatment, fixed capital in agriculture is thought of as including some land, but also some light machinery and equipment of an industry-specific kind. Mobile capital in agriculture includes some land but also machinery such as light tractors and also draft animals that can be used in the production of a range of agricultural commodities. Neither agricultural land nor agricultural capital (machinery and draft animals) is usable in the non-agricultural industries. Non-agricultural capital is thought of as including industrial machinery and buildings.

7. Technology

In every sector there is constant elasticity of substitution (CES) production technology with diminishing returns to scale to variable factors alone. However, there is also a sector specific fixed factor (immobile capital or land) in every sector. For convenience, we shall refer to the set of specific factors in the agricultural sectors as 'land', and to the set of those in the non-agricultural sectors as 'fixed capital', but for the reasons described above, this language is accurate only in an approximate way. The assumption of constant returns means that all factor demand functions are homogeneous of degree one in output. In each sector, there is a zero profit condition, which equates the price of output to the minimum unit cost of production. This condition can be thought of determining the price of the fixed factor in that sector.

8. Factor mobility and length of run

The mobility across sectors of labor, but only partial mobility of capital, means that the analysis refers to a short-run to intermediate-run period of adjustment – not very short-run, or else labor would not be fully mobile and capital might not be mobile at all – and not very long run, or else capital would be more fully mobile. The period of adjustment consistent with these assumptions is thus between 2 and 5 years.

9. Households

The model contains four major household categories – one urban (subsequently HU) and three rural. The three rural categories are differentiated by the quality of road access shared by the members of the village concerned. The three categories of road access are summarized in Table 3.

Table 3

Category HR1 refers to villages not serviced by a road at all, meaning that the only access to the village is by foot or by motorcycle, along pathways, but which are not reachable by vehicles. Category HR2 refers to dirt roads that are not usable during at least some periods of the wet season. Category HR3 refers to sealed roads or well-maintained dirt or gravel roads that can be used by vehicles at all times of the year.

The incomes of each of these three household types depend on their ownership of factors of production, the returns to those factors, and their non-factor incomes, mainly consisting of transfers from others. Since our focus is on income distribution, the sources of income of the various households are of particular interest. These differ among the four household categories. The data are extracted from the 2002-03 household income and expenditure survey, the Lao Expenditure and Consumption

Survey, commonly called LECS 3. The SAM is based on data from this survey, the input-output table described above, the Lao National Accounts for 2002 and Lao trade data.

Within the *LAOGEM* model, each of the four household categories is sub-divided into a further 100 sub-categories (centile groups) each of the same population size, arranged by real consumption expenditures per capita, giving a total of 400 sub-categories.[4] The consumer demand equations for the various household types are based on a Cobb-Douglas demand system, using data on expenditure shares extracted from the LECS 3 survey. Within each of the 4 major categories, the 100 sub-categories thus differ according to (i) their per capita expenditures, (ii) their budget shares in consumption and (iii) their sources of factor and non-factor incomes.

10. Elasticity estimates

The elasticity estimates used in *LaoGEM* for the factor demand systems were taken from empirical estimates derived econometrically for a structurally similar model of the Thai economy, known as *PARA*. These parameters were amended to match the differences between the databases for *LaoGEM* and *PARA* so as to ensure the homogeneity properties required by economic theory. All export demand elasticities were set equal to 20. The elasticities of supply of imports to Laos were assumed to be infinite and import prices were thus set exogenously. All production functions are assumed to be CES in primary factors with elasticities of substitution of 0.5 except for the paddy production industry where this elasticity is set at 0.25, reflecting the empirical observation of low elasticities of supply response in this industry. The

Armington elasticities of substitution in demand between imports and domestically produced goods were set equal to 2 for all commodities.

11. Transport costs

The information on transport costs described in Section 2, above, was used to allocate the output of the "transport" industry in the input-output table to transport margins between consumer and producer prices in each of the four household categories. The relative magnitudes of total transport costs for each category of rural household were estimated as total tonnage of goods transported multiplied by distance to nearest market multiplied by VOC kilometer on this type of road. Transport costs were assumed to be incurred primarily between the local market and the village concerned.

The distribution of total tonnage of goods transported was proxied as the distribution of total expenditure across the household groups, calculated as mean expenditure per person estimated in the LECS 3 survey multiplied by total population of the household group. Distance to the nearest market was proxied as distance from the village to the nearest post office, as recorded in the LECS 3 survey. As described above, VOCs were estimated from Starkey (2001) (ratio HR2/HR3 = 2.01; ratio HR1/HR2 = 2.86; implying a ratio of HR1/HR3 of 5.75).

This gives the ratio of total transport costs for the three categories of rural households shown in the final row of Table 4. These proportions were then used to allocate the total output of the "transport" sector of the input output-table to transport margins in the three categories of rural households. Transport margins thus differ across the three categories of rural households but within each of these categories

[4] The population sizes of the 4 major categories are not the same, but *within* each of these 4 categories the population sizes of the 100 sub-categories are the same.

they are the same for all households. Within each household category, the transport margins are the same for all commodities as proportions of consumer prices.

There are two other categories of margins between consumer and producer prices defined within the model – trade and tax margins. As Appendix Table 3 shows, trade margins are even larger in total magnitude than transport margins. It is assumed in this study that trade margins (meaning costs of warehousing, retailing and advertising) do not depend on the type of road servicing a particular village. Trade and tax margins are therefore assumed to be the same for all households and as proportions of consumer prices trade margins are the same for all commodities, while tax margins differ according to the tax rates concerned.

Table 4

In summary, the estimates of the relative magnitudes of total transport costs shown in row E of Table 4 are used as the basis for allocating total transport margins among the three rural household categories defined in the model.

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Table 1 Laos: Numbers of rural households by road access

Road access	Code	Number of households		Per cent of households	
		LECS 2 1997-98	LECS 3 2002-03	LECS 2 1997-98	LECS 3 2002-03
No access any season	HR1	2,146	2,052	31.2	31.6
Dry season access only	HR2	1,934	1,050	28.1	16.2
All season access	HR3	2,794	3,386	40.7	52.2
All rural households		`6,874	6,488	100	100

Source: Author's calculations from LECS 2 and LECS 3 survey data.

Table 2 Laos: Welfare of rural households by road access, 2002-03

Welfare indicator	No Road Access	Dry Season Access Only	All Season Access	All rural
	HR1	HR2	HR3	HR
Real consumption expenditures per person (Thousand kip per year)	1,712.6	1,917.0	2,280.2	2,070.1
Poverty incidence	45.57	36.05	28.64	34.17
School Attendance	51.90	70.48	80.67	69.41
Females (%)	47.54	67.82	80.00	67.06
Males (%)	56.27	72.98	81.37	71.72
Average expenditure on education (kip per student per month)	65,152	86,973	111,963	96,209
Proportion of persons who became ill in the last 4 weeks (%)	15.63	13.37	13.31	14.07
Of those ill, those who did not seek treatment (%)	89.80	83.16	80.69	84.35

Source: Author's calculations from the LECS 3 database.

Table 3 Naming of household categories

Description	Classification
Urban	HU
Rural, no road access	HR1
Rural, dry season access	HR2
Rural, all season access	HR3

Table 4 Laos: Estimating total transport costs by rural household category

Household group		HR1 (No Road)	HR2 (Dry Season)	HR3 (All season)	HU (Urban)
Mean expenditure per capita (Kip)		106,971	118,799	145,704	260,646
Population		949,698	708,054	2,197,436	1,374,542
Population share (%)		18%	14%	42%	26%
Total expenditure (million Kip)	A	101,590	84,116	320,176	358,269
Distance to nearest post office (KM)	B	36.67	29.61	13.47	0
Ratio to HR3		**2.64**	**1.84**	**1**	**0**
Vehicle operating cost ($/KM)	C	1.104	0.386	0.192	0
Ratio to HR3		**5.75**	**2.01**	**1**	**0**
Total transport cost = A×B×C	D	4,284,121	871,736	862,553	0
Ratio to HR3	E	**4.97**	**1.16**	**1.00**	**0**

Note: Row D = Rows A×B×C
Source: Author’s calculations based on data from National Statistical Centre, Vientiane, *Lao Expenditure and Consumption Survey*, *2002-03* (LECS 3), ADB (2003) and Starkey (2001).

Appendix Table 1 The *LaoGEM* Model: List of Industries

Crops	1 CROPS
Livestock and poultry	2 LVSTK
Forestry and logging	3 FOREST
Mining and quarrying	4 MINING
Food, beverage and tobacco	5 FOOD
Textiles, garments & leather products	6 TEXTILE
Wood & paper products; printing/publishing	7 WOOD
Petroleum and chemical products	8 PETROLEUM
Non-metallic mineral products	9 MINERAL
Metal prods, machinery, equipment, spare parts	10 METAL
Other manufactured goods	11 OTHMAN
Electricity and water supply	12 ELECWAT
Construction	13 CONSTR
Transportation	14 TRANSP
Post and telecommunication	15 POSTEL
Wholesale and retail trade	16 TRADE
Banking, insurance, business services	17 BANK
Real estate & ownership of dwellings	18 ESTATE
Public administration	19 GOVT
Personal, social & community services	20 OTHSERV

Appendix Table 2 The *LaoGEM* Model: Cost Structure of Domestic Industries (Million Kip)

Industry	1 Intermediate Domestic	2 Intermediate Imported	3 Margin	4 Indirect Tax	5 Labor	6 Capital	7 Land	8 Production Tax	Total
1 CROPS	242,954	100,077	22,661	3,719	2,745,382	1,766,305	883,152	1	5,764,251
2 LVSTK	1,386,197	150,889	120,191	15,107	844,254	1,519,619	759,808	1	4,796,067
3 FOREST	20,760	13,988	4,861	1,359	241,079	199,710	99,855	1	581,613
4 MINING	416,239	1,430,354	219,600	24,821	31,996	35,120	17,560	1	2,175,692
5 FOOD	6,426,728	264,542	457,400	86,018	885,301	1,806,187	-	1	9,926,175
6 TEXTILE	116,471	56,690	21,104	1,870	64,003	134,604	-	1	394,744
7 WOOD	418,414	140,440	88,632	29,851	30,608	72,898	-	1	780,844
8 PETROLEUM	2,879	16,105	2,392	205	261	796	-	1	22,641
9 MINERAL	49,160	53,510	16,252	1,956	37,046	70,513	-	1	228,438
10 METAL	23,424	124,715	19,445	1,476	17,235	33,163	-	1	219,459
11 OTHMAN	11,879	114,847	18,745	907	43,859	118,104	-	1	308,343
12 ELECWAT	209,009	67,005	26,488	12,016	133,952	348,218	-	1	796,690
13 CONSTR	352,785	511,014	163,392	9,271	159,856	229,981	-	1	1,426,301
14 TRANSP	72,942	116,749	21,399	2,458	465,901	463,261	-	1	1,142,711
15 POSTEL	19,644	39,002	6,172	658	54,258	84,834	-	1	204,569
16 TRADE	171,540	242,173	56,453	7,797	563,077	1,073,985	-	1	2,115,025
17 BANK	31,194	2,839	7,887	986	12,295	133,455	-	1	188,656
18 ESTATE	43,086	609	1,220	1,278	87,633	391,718	-	1	525,546
19 GOVT	252,489	123,958	32,813	6,389	510,126	1	-	1	925,777
20 OTHSERV	330,197	826,517	177,493	12,534	192,129	316,125	-	1	1,854,996
Total	10,597,991	4,396,025	1,484,601	220,675	7,120,254	8,798,596	1,760,376	20	34,378,536

Appendix Table 3 The *LaoGEM* Model: Sales Structure of Domestic Industries and Commodities (Million Kip)

	1 Intermediate	2 Investment	3 Households	4 Export	5 Government	6 Stocks	7 Margins	8 Total	9 Imports	Total
1 CROPS	2,754,562	488,542	2,190,597	330,549	0	1	0	5,764,251	224,806	11,753,308
2 LVSTK	4,087,407	647,224	28,763	32,670	0	1	0	4,796,067	0	9,592,132
3 FOREST	456,644	66,678	29,999	28,291	0	1	0	581,613	0	1,163,227
4 MINING	130	695	0	2,174,866	0	1	0	2,175,693	0	4,351,385
5 FOOD	984,019	717,400	8,217,420	7,334	2	1	0	9,926,176	372,004	20,224,356
6 TEXTILE	106,344	25,497	226,109	36,793	0	1	0	394,744	238,884	1,028,371
7 WOOD	35,259	1,423	5,496	738,665	0	1	0	780,844	117,941	1,679,629
8 PETROL'M	12,919	1	1,132	8,589	0	-1	0	22,641	2,292,650	2,337,932
9 MINERAL	221,442	1	5,310	1,685	0	-1	0	228,438	0	456,875
10 METAL	142,370	40,577	24,751	11,759	0	1	0	219,459	2,324,624	2,763,543
11 OTHMAN	180,407	16,862	78,087	32,986	0	1	0	308,343	28,193	644,880
12 ELECWAT	625,640	1	171,050	0	0	-1	0	796,690	0	1,593,380
13 CONSTR	67,154	1,346,019	13,127	0	0	1	0	1,426,301	0	2,852,601
14 TRANSP	0	1	0	0	0	-1	1,142,711	1,142,711	132,988	2,418,410
15 POSTEL	122,301	1	82,267	0	0	-1	0	204,569	0	409,137
16 TRADE	124,399	13,657	73,446	0	1	1	1,903,522	2,115,025	0	4,230,051
17 BANK	180,052	1	8,604	0	0	-1	0	188,656	0	377,313
18 ESTATE	65,233	1	460,313	0	0	-1	0	525,546	0	1,051,092
19 GOVT	0	1	121,949	0	803,828	-1	0	925,777	0	1,851,555
20 OTHSERV	431,707	1	1,423,289	0	1	-1	0	1,854,996	0	3,709,992
Total	10,597,991	3,364,582	13,161,709	3,404,187	803,832	2	3,046,233	34,378,540	5,732,091	74,489,168