

A System Dynamics Study on the Liberalization Plans of the Philippine Automotive Industry

by

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The goal of Philippine industries in the next millennium is to sustain and improve its performance with liberalization. This study chose the Automotive Industry (AI) as its host industry and has looked into the usefulness of System Dynamics (SD) in understanding the AI's behavior as it experiences a transition from a regulated to a liberalized system with the elimination of two regulating policies: local content and foreign exchange requirements. This study used the Dynamo Software and limited its scope to the passenger car sector beginning from 1987, when the revised motor vehicle program was first implemented, to 2004, when liberalization policies will be lifted.

Simulation results show that the local content requirement keeps cost and car prices down; whereas, the foreign exchange requirement helps develop the local parts industry by increasing car production rate, employment rate, exports of car parts, and car parts manufacturers.

For the past decade, the Philippine Automotive industry (PIA) has been experiencing growth, policy changes, and the entry of new players. From the importation of Completely Built Up (CBUs) units in the 1950s and the introduction of Semi-Knock Downs (SKDs) in the 1960s, the industry, with the support of the government, implemented the motor vehicle program. One of the main objectives of the motor vehicle program is the development of the local and exports car parts manufacturers. With the implementation of the motor vehicle program in 1987, it saw the growth of the number of car parts makers, from 60 in 1988 to 176 in 1993. News reports state that the expansion of the local car market revved up the steady growth of the Philippine economy.

Market analysts and many of the major players believe that the vehicle industry has a big potential for growth. Part of the industry's objective, therefore, is to sustain its growth and sales performance for the next decades. With the current globalization trends, countries in the ASEAN region, such as the Philippines, will be compelled to enter into the reduction of tariff agreement and the complementation agreement to increase ASEAN trade flow. The liberalization of the Philippine Automotive Industry poses uncertainty in terms of the industry's performance until the year 2004.

The liberalization schemes due to Asia Pacific Economic Committee (APEC), Common Effective Preferential Tariff (CEPT), and World Trade Organization (WTO) countries have brought down tariffs and facilitated the importation of all types of brand new motor vehicles. With the new rules of economic order, the motor vehicle program will be removed. The removal will result in the elimination of the local content and foreign exchange requirements.

According to the Federation of Philippine Industries (FPI) survey, 6 out of 10 local companies or 63 percent of surveyed respondents encountered difficulties in coping with the government's liberalization program or policies. The survey involved 65 companies from different industries.

Interviews and secondary sources reveal that liberalization will bring about changes in the industry, such as the promotion of competition and an increase in the importation of goods. Industry players believe that imposing a minimum local content and the foreign exchange requirement are beneficial to the growth of the industry. On the other hand, some oppose the implementation of the local content, claiming that this is just a transitional policy and will merely stunt the industry. This group believes that fast tracking the implementation of liberalized policies will promote or enhance the industry in preparation for 2004 or total liberalization. With this background, this paper will determine whether the implemented policies contributed to the development of the industry or if the growth of the industry is more attributable to the market conditions rather than policy changes. There is, therefore, a need to determine the industry's behavior with the elimination of the policies, specifically the local content and foreign exchange requirement, in the motor vehicle program.

This study will look in to how changes (i.e., policies) affect a system (i.e., industry) through the use of the System Dynamics approach. In developing the model, systems thinking, a discipline for seeing "structures" that underline complex situations, and for discerning high from low leverage changes, is used. The Dynamo software is then used to facilitate the simulation process.

Background on the Philippine Automotive Industry

In 1973, the government implemented the first vehicle manufacturing programs: Progressive Car Manufacturing Program (PCMP), Progressive Truck Manufacturing Program (PTMP), and the Progressive Motorcycle Manufacturing Program (PMMP) (Aquino, 1990). Prior to these programs, there were more than 20 car assemblers in the country, with more than 30 brands and 100 models. New registration was less than 30,000 cars per year. The government had little control over importation and assemblers accounted for less than half of the market. Importers of CBU vehicles and jeep assemblers supplied the vehicles on the road.

The three programs were based on the proven and tested development strategy, employing the Completely Knocked Down (CKD) concept with increasing levels of local value added from domestically produced automotive components (Magallanes, 1990). The programs had the primary objective of developing a viable automotive component and programs were therefore geared to save and earn foreign exchange, generate employment, develop motor vehicle parts manufacturing, and promote the transfer of technology (Sabhawal, 1993). Aside from the three folds increase in the car parts makers in the country, 91 types of local parts have been integrated into the high-volume car category.

The 1973 guidelines only permitted locally assembled cars with at least 35 percent local content by the programs' third year. Only Board of Investments (BOI) registered participants were given foreign exchange applications. The implementation

of the vehicle program in 1973 stimulated the manufacture of automotive parts because of the local content requirement. (PDCP Bank Industry Digest, 1995). In 1987, the government launched two new main vehicle programs to replace the PCMP and PTMP and develop the local automotive industry: the Car Development Program (CDP) and the Commercial Vehicle Development Program (CVDP). The motor vehicle programs were revitalized in recognition of the sector's potential to spur economic growth (MBC, 1989). The CDP had four main objectives and a thrust to gradually increase the local content. See Table 1. The CDP has three categories. See Table 2.

TABLE 1
SALIENT POINTS OF THE VEHICLE DEVELOPMENT PROGRAM

ITEMS	CAR DEVELOPMENT PROGRAM
OBJECTIVES	<ul style="list-style-type: none"> • Development of the parts manufacturing industry • Technology transfer and development • Employment generation • Foreign exchange savings and earnings
LOCAL CONTENT (percentage)	1988 = 32.26 % 1989 = 36.58 % 1990 – 1994 = 40.00 %
FOREIGN EXCHANGE REQUIREMENTS	Participants must earn 50 percent of foreign exchange requirement through exports of Philippine products. Auto parts should progressively account for higher percentage until it accounts for 100 percent in five years (1993)
INVESTMENTS	Investments in a main component that can account for at least nine percent of net local content requirement

Source: Board of Investments (BOI)

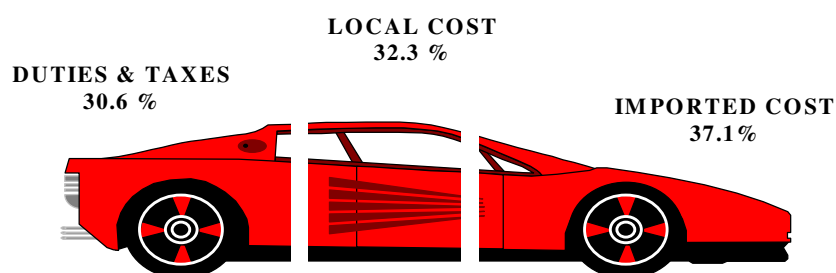
TABLE 2
THE CAR DEVELOPMENT PROGRAM PARTICIPANTS

CATEGORY	COMPANY	MODELS
1. PEOPLE'S CAR (Engine displacement of 1,200cc or below)	1. <i>Asian Carmakers Corporation</i> 2. Columbian Autocar Corporation 3. Honda Cars Philippines, Inc. 4. Italcarr Pilipinas Corporation 5. Transfarm & Company, Inc.	Daihatsu Charade Kia Pride Honda Civic 1.2 Fiat Uno Daewoo Racer/Espero
2. MAIN (Above 1,200cc but below 2,190cc)	1. <i>Asian Carmakers Corporation</i> 2. Columbian Autocar Corporation 3. Honda Cars Philippines, Inc. 4. Italcarr Pilipinas Corporation 5. Nissan Motor Philippines, Inc. 6. Philippine Automotive Mftg., Corporation 7. Toyota Motors Philippines	BMW 3 Series Mazda 323 and 626 Honda Civic and Accord Sentra Models; altima, Hyundai Excel, Lancer models, Space Wagon, Corolla, Corona, and Crown
3. LUXURY CARS 2,190 cc and above (equivalent diesel engine displacement)	1. <i>Asian Carmakers Corporation</i> 2. Commercial Motors Corporation 3. Scandinavian Motors Corporation 4. Nissan Motor Philippines	BMW 5 Series Mercedes-Benz Volvo models Nissan Cendric

Source: Board of Investments (BOI)

Car Prices has an effect on the sales performance of the industry. Generally, production cost determines the prices of cars. The expenses for raw materials constitutes 40 to 60 percent of the total production costs of auto parts manufacturers.

The next cost contributors are distribution and overhead costs. Local components constitute only four percent of costs. This includes tires and transmissions. The individual shares of expenses for salaries and wages, energy, and depreciation vary depending on the auto parts produced. In addition, Taxes take up most of the price of cars. Taxes include 30 percent import duties, 15 percent ad valorem, 10 percent value added tax, and 10 percent VAT on the car dealers' profit margin. On a per unit basis, taxes may amount to no less than US\$ 2,075. If these were deducted, a typical brand-new, four-door locally assembled car would cost US\$ 5,000.



Source: Philippine Automotive Federation, Incorporated (PAFI)

PAI and Trade liberalization

As part of its commitment to various regional trade bodies, the liberalization of the automotive manufacturing industry will result in the elimination of protectionist policies on automobile components. One of the major changes are with the local content and foreign exchange requirement.

Local content. Local content is defined as the percentage of net local content over selling price of manufacturing cost if the parts are produced in-house. This strategy ensures greater value-added to the economy and lessens the vulnerability of the industry to foreign exchange problems (PDCP, 1997). See Table 1. With the introduction of liberalization, the Board of Investment (BOI) would ease the local content usage of existing assemblers.

Foreign Exchange. The Board of Investments (BOI) has imposed a foreign exchange requirement to car assemblers. This compels car development participants to earn foreign exchange credits through the export of automotive products in order to import completely knocked down parts (CKDs). BOI guidelines indicate that the foreign exchange ratios for various categories of the car program as a percentage of CKD import value shall follow the ratios in Table 4. The BOI, upon the introduction of liberalization, would eliminate the foreign exchange credit policies.

Under the liberalization, new companies will be allowed to enter sectors of the auto market that are currently closed, including small and medium cars, light commercial vehicles, and motorcycles. Liberalization could be seen from two angles: as a threat, but also as an opportunity. Liberalization will open the market to new

companies and permit imports of CBUs and second hand units and thereby exposing car part makers and assemblers to greater competition. For example, Nissan, one of the leading auto assemblers, views the liberalization program as good since it gives customers a wider array of products to choose from and provides a competitive atmosphere to both car manufacturers and assemblers (Business Daily, 1996).

Table 4
Required Foreign Exchange Ratios

Year	Main Car (Category II)	Year	Main Car (Category II)
1987	Encouraged	1994	40 percent
1988	Encouraged	1995	40 percent
1989	20 percent	1996	45 percent
1990	40 percent	1997	45 percent
1991	40 percent	1998	50 percent
1992	40 percent	1999	50 percent
1993	40 percent	2000	50 percent

Source: Board of Investments (BOI)

Industry experts believe that some organizations, like the assemblers, are already prepared for liberalization and that car parts makers will be seriously hit. Car parts makers, which are generally small and medium enterprises, will have difficulty when liberalization takes effect. In addition, car parts makers will experience a limited market since imported parts will flow in. The vehicle program assures the car local parts makers of a market via the local content requirement for assemblers. Unless the parts makers target the export market, they will have a hard time competing. Another suggestion is for these parts makers to tie-up or to have joint ventures with foreign partners. However, there is always the risk of being taken over by the foreign partners because of their size.

The liberalization of the automotive industry therefore threatens the viability of small and medium-scale car parts makers, which make up two-thirds of the industry. The entry of cheaper and higher quality components would render components and parts made by these companies uncompetitive.

On the other hand, liberalization could also be seen as an opportunity for the industry. Liberalization could motivate the industry to be on competitive footing. It would also open and create business opportunities for the participants. Nissan sees that the market would continue to be competitive with the entry of more players as the Filipinos' demand for cars grows along with increasing expectations of premium quality, car durability, and good after sales support (Business Daily, 1996). In addition, liberalization would also promote the relocation of foreign suppliers in the Philippines. The suppliers would then contribute to the Philippine export market.

Overview of the Philippine Automotive Industry Model

This study is geared to help the automotive industry players, including policy makers i.e., Board of Investments (BOI) and the Department of Trade and Industry (DTI) and implementors (i.e. Land Transportation Office), assess the effectiveness of the present policies and as a guide in making adjustments.

This study will focus on the passenger car category of the Car Development Program (CDP) of the Philippine Automotive Industry (PAI) and its car parts manufacturing sector. It was observed that the passenger car category experienced the most number of policy changes since the 1987 automotive program or the revised vehicle program. The study timeframe covers from 1987 earliest data, when the revised motor vehicle program was first implemented, to 2004, when liberalization policies will be lifted. The earliest data considered in the study dates back to the late 1980's. Figure 1 shows an overview of the system dynamics model of the PAI.

Sales. The industry generally considers sales as its gauge in evaluating industry performance. If sales is increasing, the industry is doing good. In defining the components of sales, changes in new car sales figures are attributed to the magnitude of the buying population and the affordability of car units. The size of the market base affects the sales rate of cars. However, the effect of population on the amount of sales may not be readily experienced. On the other hand, affordability refers to the ability of consumers to buy a car unit, which is affected by the level of car prices and the interest rate offered by financing agencies. The prices of cars largely depends on the cost of production, mainly changes in material cost. Furthermore, consumers of passenger cars put higher weight on the price of the car in their buying decision. Car prices and production cost, car utility and life expectancy, interest rate, which represents the stability of the economy, and the buying population are the factors that affect sales.

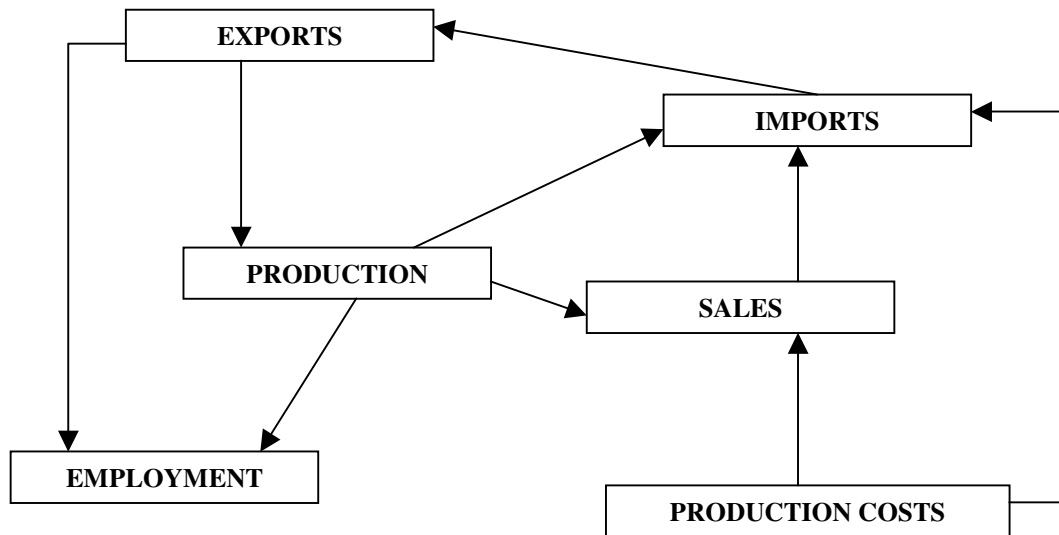
Production Cost. Production cost, together with margins, excise tax, value added tax, determine the price of a new car. The production cost is mainly composed of material, labor, and overhead cost. Furthermore, peso devaluation directly affects the cost of imported materials since these items are procured at Cost in Freight (CIF). The appreciation of the yen also affects cost since the local assemblers purchases the cost of manufacturing CKD parts at a higher value.

Imports and Export. Compliance with the export requirement is another factor in determining the production rate of the industry. One of the main requirements of the government is the foreign exchange (FOREX). Assemblers earn their FOREX by exporting locally manufactured car parts through their car parts manufacturer affiliate. For example, Toyota Motor Philippines, a car assembler, has Toyota Auto Parts (TAP) as its car part affiliate. Assemblers need to export car parts in order to import CKD components. The requirement set by the government policy Memorandum Order (MO) 346 states that assemblers should attain a certain percentage in order to import needed components. (See Table 4.) With this policy, the number of generated imports affects the production rate of the industry since the essential parts in car assembly are imported.

Production. The level of car production is considered one of the main indicators of the industry. Production indicates how busy the industry is. As seen in Figure 1, the production rate is dependent on two factors: the number of car assemblers and the value foreign exchange earned. The production rate, therefore, is a choice between the industry capacity and production based on the value of exports, whichever is minimum. The choice is brought by the government's policy requirement that production is based on the amount of exports. In order for assemblers to produce, their import requirement is regulated by their amount of export. For example, in

1995, the foreign exchange requirement was pegged at 40 percent. This means that 40 percent of the total export value was the equivalent value of import awarded to the assemblers.

Employment. The level of employment in the industry is also a basis in gauging the development of the industry – the number of employment generated by the industry. Employment is generated by an increase in the number of assemblers and car parts makers. The study only includes assembly and local parts manufacturing. An increase in the number of investors results in an increase in employment.



The Philippine Automotive Industry Model
Figure 1

Simulation of the Model

The model would have a base run where there would not be any policy-related changes. The other run would involve changing simultaneously the values of the local content requirement and foreign exchange requirements after the year 2000 and changing it one at a time.

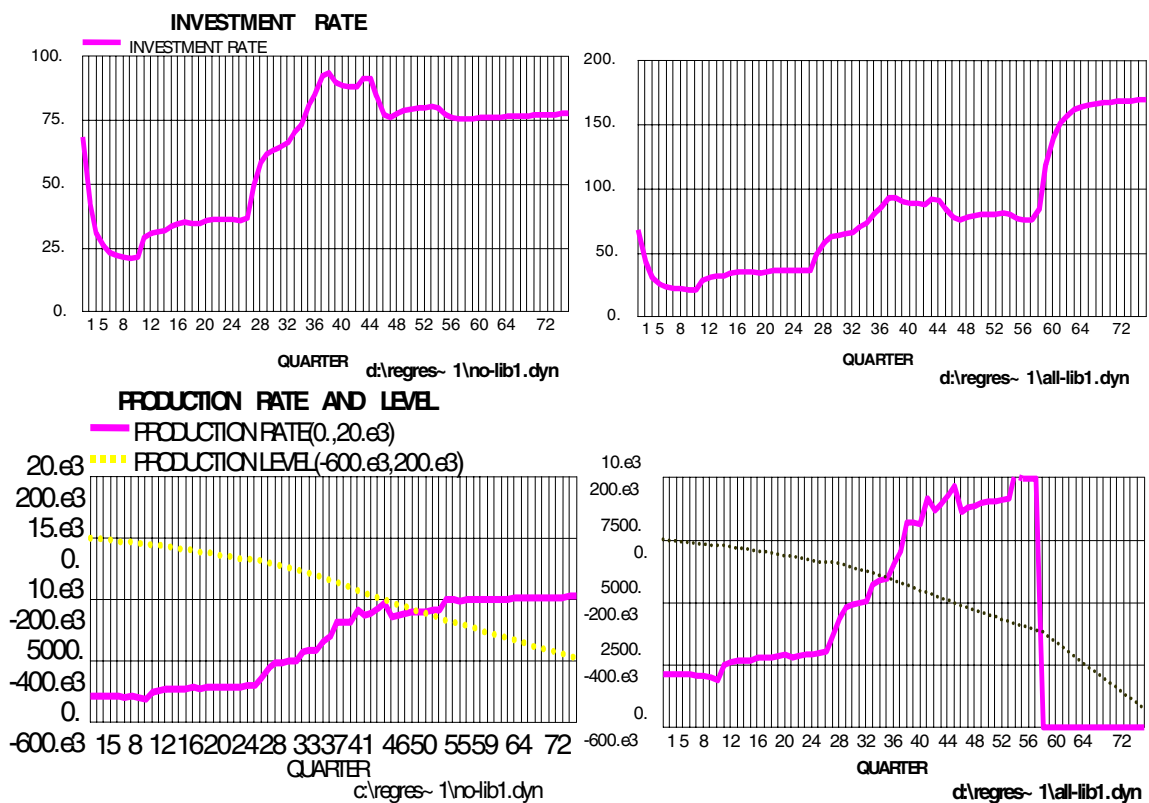
One of the policy changes involved in liberalizing the industry is setting the local content to zero after the year 2000. After 2000, the assemblers would no longer be required by the government to maintain at least a local content requirement. Although realistically assemblers will still incur a certain local content cost due to labor and overhead cost, the model affixes a value of zero after the year 2000 as the local content for convenience. This will not affect the analysis of the study since the main concern is to get the relationship between variables.

Another policy change in liberalization is the elimination of the foreign exchange requirement (FOREX) on assemblers who wish to import parts. After the year 2000, there would be no more FOREX requirement on assemblers.

Simulation Results

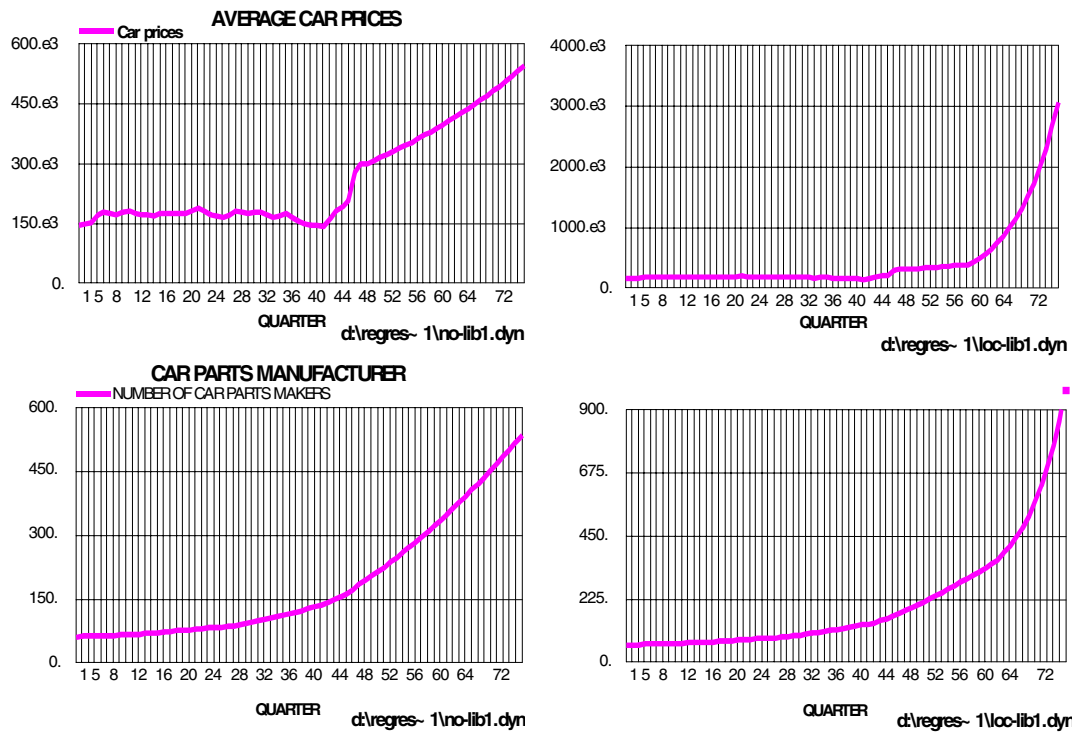
- The base run results showed that the industry would experience a steady growth if there were no changes made in the present policies.
- The simulation results reiterate the expectation of several industry analysts that liberalization would generally affect the industry's development. Although an increase in the number of investors would be experienced, the main areas that indicate the industry's growth have resulted in lower levels such as production rate and car parts employment. In addition, sharp increases in car prices would also be experienced by a liberalized industry.

Sample Results:



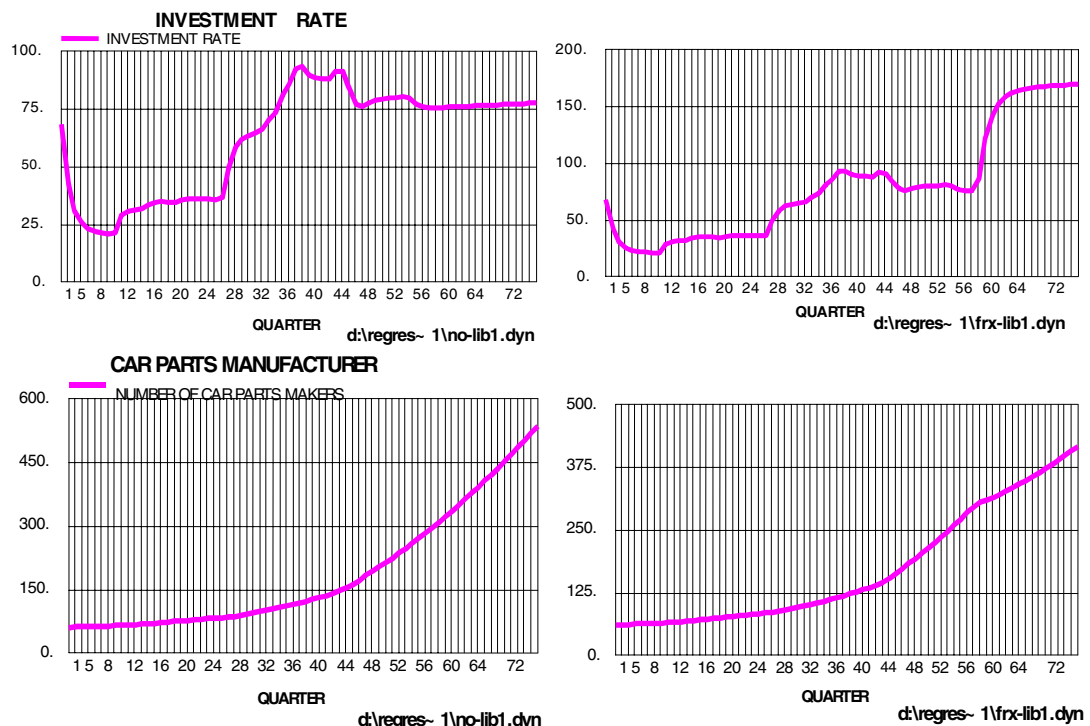
- The results show that the elimination of the local content requirement would increase the average car prices. This suggests that the local content tend to keep the car prices low. On the other hand, the elimination of this policy also shows an increase in the following variables: car parts manufacturing companies, employment of the industry, and production rate. The results therefore suggest that the initial purpose of the local content of developing the car parts manufacturing sector is not addressed., as it has even hindered the growth of that sector.

Sample Results:



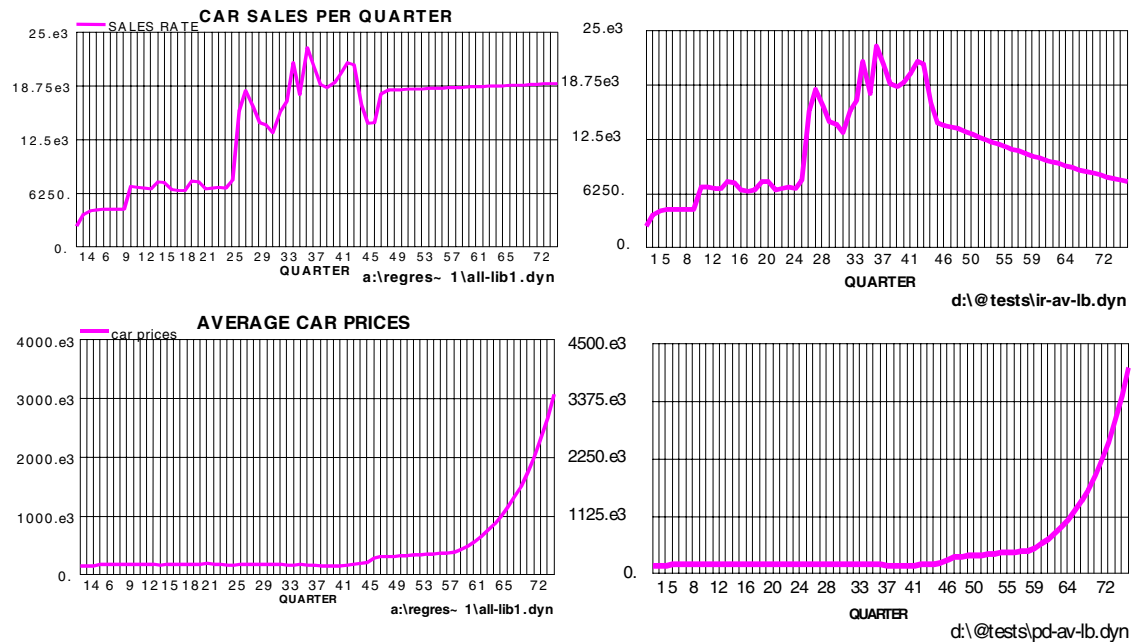
- The simulation results on the removal of the foreign exchange requirement would increase the investment rate which is a positive outcome for the industry. However, the elimination of this policy decreased the levels of the following variables: car parts manufacturers, employment, and production rate, which are indicate the development of the local car industry.

Sample Results:



- Other simulation tests were conducted by changing the values of interest rate, buying population, and exchange rates. Changes were introduced in these variables to see its significance in the model. The simulated result shows that the interest rates has the most number of affected variables in the model and had the highest effect on car sales. On the other hand, changes in currency exchange rate values has an effect on car prices, employment, and number of car parts manufacturer.

Sample Results:



Summary and Conclusion

In the Philippine Automotive Industry (PAI), the implementation of the local content and foreign exchange requirement policies are implemented for development and growth. Each policy proposed and implemented is questioned to ensure that it addresses the objectives of the automotive program. Liberalization, being an inevitable reality by the year 2004, policy makers would like to ensure that the policies implemented before liberalization would prepare the industry. System Dynamics allows the policy makers to simulate the effect of the policies they intend to implement.

The study's main concern is to analyze the behavior of the automotive industry with the introduction of these new policies, specifically the elimination of the local content and foreign exchange requirements. The study showed the following conclusions:

- The liberalization of the industry would stunt its growth, specifically the decrease in the number of car parts manufacturers. In addition, it would catalyze the increase in car prices.
- The foreign exchange requirement addresses the goal of the vehicle program-the development of the car parts manufacturing sector. The elimination of the FOREX would mean a great loss in terms of the support it gives to the development of the

local parts manufacturing sector. FOREX, being a significant input to the value of exports, assures the industry of an expected production and foreign earnings.

- Imposing a high local content requirement is seen as a limiting factor to the growth of the industry. Even though, the local content requirement assures a ready market for the local parts manufacturer, this policy actually hinders the growth of the industry when placed at a higher rate compared to what the local parts manufacturers can provide. Upon the removal of the local content in the simulation, car parts manufacturers experience a higher growth rate. This suggests that the local content requirement imposed by the government is too high, and that the car parts manufacturer is not yet ready. Local content helps the industry by bringing down car prices.

This study therefore suggests lowering the local content requirement imposed on assemblers and helping the local parts manufacturers lower the cost of parts production in order to become competitive with imported parts.

- Car Sales, being highly dependent on factors that are economic in nature, is not a good indicator in assessing the effectiveness of the motor vehicle policy. Indicators such as the employment generated by the industry and exports, are more appropriate since these variables are directly related to the policies imposed by the government.
- Lastly, currency exchange rates are seen as an external leverage that directly affect the development of the local automotive industry.

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