Toyota is exposed to market risk from changes in foreign currency exchange rates, interest rates, certain commodity and equity security prices. It's share of total vehicle unit sales in each market is influenced by the quality, price, design, economy and utility of its vehicles. Changes in laws and regulations also materially impact the profitability of Toyota's automotive operations. Toyota monitors and manages these risks as an integral part of its overall risk management program.

AV Vedpuriswar and Rajesh Kumar Singh

Enterprise risk management in Toyota[1]

Toyota's major business segments are automotive and financial services. Automotive is Toyota's most significant segment, accounting for approximately 90% of Toyota's total revenues and 96 % of Toyota's operating income for the year ended March 31, 2002. Toyota's primary markets based on vehicle unit sales for the year ended March 31, 2002 were: Japan (40%), North America (32%) and Europe (13%).

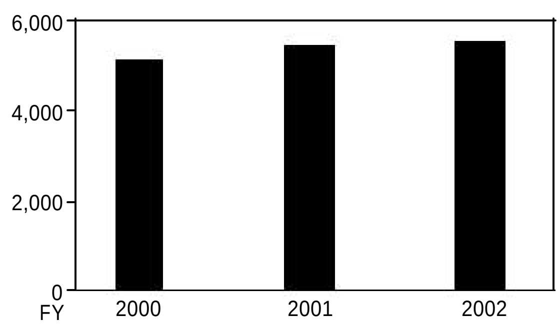
Business risks

The worldwide automotive market is highly competitive and cyclical. Demand for automobiles in each market can vary substantially from year to year. Demand depends to a large extent on general economic conditions in a given market, the cost of purchasing and operating automobiles and the availability and cost of credit and fuel.

Toyota's vehicle unit sales in Japan decreased during fiscal 2002 resulting primarily from an overall industry decline in the Japanese market and increased competition from other domestic manufacturers. This decrease followed increases in Toyota's vehicle unit sales in this market during fiscal 2000 and 2001 driven by new models and the strong sales efforts of domestic dealers. Toyota's vehicle unit sales in North America and Europe increased steadily during fiscal 2002, 2001 and 2000, reflecting strong demand for Toyota's vehicles in both these regions. Toyota's vehicle unit sales increased in these markets during fiscal 2002 despite a general slowdown in global economic growth, particularly in the United States, beginning in the second half of 2000. In the aggregate, Toyota's vehicle unit sales in all other markets increased during fiscal 2002, following an increase during fiscal 2001 and a decrease during fiscal 2000.

Vehicle Sales Worldwide

(Excluding vehicle produced by non-consolidated companies)
(Thousands of Units)



Toyota's share of total vehicle unit sales in each market is influenced by the quality, price, design, performance, safety, reliability, economy and utility of its vehicles compared with those offered by other manufacturers. The timely introduction of new or modified vehicle models is also an important factor in satisfying customer demand. Toyota's ability to satisfy changing customer preferences can affect its revenues and earnings significantly.

The profitability of Toyota's automotive operations is affected by many factors. These factors include:

- Vehicle unit sales volumes;
- The mix of vehicle models and options sold;
- The levels of price discounts and other sales incentives and marketing costs;

[1] This case study chews heavily from Toyota's annual reports available on its website.

- The cost of customer warranty claims and other customer satisfaction actions;
- The cost of research and development and other fixed costs;
- The ability to control costs;
- The efficient use of production capacity; and
- Changes in the value of the Japanese yen and other currencies in which Toyota does business.

The worldwide automotive industry is in a period of globalization and consolidation, which may continue for the foreseeable future. As a result, the competitive environment in which Toyota operates is likely to intensify. Toyota believes it has the resources, strategies and technologies in place to compete effectively in the industry as an independent company for the foreseeable future.

Regulatory risks

Changes in laws, regulations, policies and other governmental actions can also materially impact the profitability of Toyota's automotive operations. These laws, regulations and policies include those affecting environmental matters and vehicle safety, fuel economy and emissions. Such laws add significantly to the cost of vehicles. The European Union requires manufacturers to be financially responsible for taking back end-of-life vehicles and dismantling and recycling these vehicles. Many governments also regulate local content, impose tariffs and other trade barriers and enact price or exchange controls which can limit an automaker's operations and can make the repatriation of profits to an automaker's home country difficult. Changes in these laws, regulations, policies and other governmental actions may affect the production, licensing, distribution or sale of Toyota's products, cost of products or applicable tax rates.

Market risk disclosures

Toyota is exposed to market risk from changes in foreign currency exchange rates, interest rates and certain commodity and equity security prices. In order to manage the risk arising from changes in foreign currency exchange rates and interest rates, Toyota uses a variety of derivative financial instruments.

Toyota monitors and manages these financial exposures as an integral part of its overall risk management program, which recognizes the unpredictability of financial markets and seeks to reduce the potentially adverse effect on Toyota's operating results.

The financial instruments included in the market risk analysis consist of all of Toyota's cash and cash equivalents, marketable securities, finance receivables, securities investments, long-term and short-term debt and all derivative financial instruments. Toyota's portfolio of derivative financial instruments consists of foreign exchange forward contracts, foreign currency options, interest rate swaps, interest rate currency swaps agreements and interest rate options. Anticipated transactions denominated in foreign currencies that are covered by Toyota's derivative hedging are not included in the market risk analysis. Although operating leases are not required to be included, Toyota has included these instruments in determining interest rate risk.

Currency fluctuations

Toyota is sensitive to fluctuations in foreign currency exchange rates, especially the US dollar and the euro and to a lesser extent the British pound. Toyota's consolidated financial statements, which are presented in Japanese yen, are affected by foreign currency exchange fluctuations through both translation risk and transaction risk. Changes in foreign currency exchange rates may positively or negatively affect Toyota's revenues, gross margins, operating costs and expenses, operating income, net income and retained earnings.

Translation risk is the risk that Toyota's financial statements for a particular period or for a particular date will be affected by changes in the prevailing exchange rates of the currencies in those countries in which Toyota does business against the Japanese yen. Even though the fluctuations of currencies against the Japanese yen can be substantial and, therefore, significantly impact comparisons with prior periods and among various geographic markets, the translation effect is a reporting consideration and does not reflect Toyota's underlying results of operations. Toyota does not hedge against translation risk.

Transaction risk is the risk that the currency structure of Toyota's costs and liabilities will deviate from the currency structure of sales proceeds and assets. Transaction risk relates primarily to sales proceeds from Toyota's non-domestic sales produced in Japan and, to a lesser extent,

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Box 1: Company and financial highlights

Toyota Motor Corporation is the third largest automaker in the world and produces a full range of model offerings—from mini vehicles to large trucks. Global sales of its Toyota and Lexus brands, combined with those of Daihatsu and Hino, totaled 5.94 million units in FY2001. As of March 2002, besides its 12 own plants in Japan, Toyota has 54 manufacturing companies in 27 countries/locations, which produce Lexus- and Toyota-brand vehicles and components, employs 246,700 people worldwide (on a consolidated basis), and markets vehicles in more than 160 countries.

Automotive business, including sales finance, accounts for more than 90% of the company's total sales, which came to a consolidated ¥15.1 tn in the fiscal year to March 2002. Toyota also has a growing portfolio of diversified operations, with ventures in telecommunications, prefabricated housing and leisure boats. Toyota's Lexus- and Toyota-brand vehicles rank among the world's highest-quality cars in third-party surveys of customer satisfaction.

Using such success as a springboard, Toyota is pursuing a policy of sustained development through innovation and strong R&D to develop automobiles that are greener, safer and more fun to drive. The Toyota production system has become the basis for highly efficient "lean" manufacturing in industries worldwide. In January 2002, Toyota began operating the Toyota Institute, an internal organization that acts to nurture the growth of a global workforce who can share the "Toyota way". Overseas, the city of Kolin in the Czech Republic was chosen in December 2001 as the location for Toyota's joint venture with PSA Peugeot Citroën, SA. In Poland, transmission production begins in June 2002 and, in the second half of the year, passenger car production will start in Tianjin, China. In 2001, Toyota launched the Estima Hybrid minivan and the Crown mild hybrid luxury sedan in Japan — following the road opened by the Prius in 1997. These three hybrid vehicles together have so far achieved worldwide cumulative sales of more than 100,000 units as of April 2002.

Regarding fuel cell vehicles, Toyota began public road tests in Japan and the United States in 2001 and Toyota hopes to undertake a limited sales release of such vehicles in the Japanese market by the end of 2003.

Financial highlights

Business results (fiscal year, consolidated, Japan GAAP)

(1 = ¥1 mn)

	1998	1999	2000	2001	2002
Net revenue	11,678,397	11,678,397	12,879,561	13,434,423	15,106,297
Income before income tax	884,516	884,516	750,501	864,129	1,113,524
Net income	454,350	454,350	406,798	471,295	615,824
Vehicle production (Units)	4,233,371	4,233,371	5,002,731	5,275,213	5,404,216
Vehicle sales (Units)	4,456,344	4,456,344	5,182,774	5,526,863	5,784,917
Employee	159,035	159,035	210,709	215,648	246,702
Capital investment *1	788,742	788,742	871,329	860,821	940,344
Depreciation *1	508,380	508,380	689,435	672,567	699,203
R&D spending	444,400	444,400	453,300	479,900	592,500

*1 Not including vehicles for leasing.

Source: www.toyota.com.

proceeds from Toyota's continental European sales produced in the United Kingdom.

Toyota believes that the location of its production facilities in different parts of the world has significantly reduced the level of transaction risk. As part of its globalization strategy, Toyota has localized much of its production by constructing production facilities in the major markets in which it sells its vehicles. In 2001, Toyota produced 54% of Toyota's non-domestic sales outside Japan. In North America, 59% of vehicles sold in 2001 were produced locally. In Europe, 36% of vehicles sold in 2001 were produced locally. Local operations permit Toyota to purchase many of the supplies and resources used in the production process. This to a great extent matches the currencies of local revenues with those of local expenses.

Toyota also enters into currency borrowings and other hedging instruments to address a portion of its transaction risk. This has reduced, but not eliminated, the effects of foreign currency exchange rate fluctuations, which in some years can be significant.

Generally, a weakening of the Japanese yen against other currencies has a positive effect on Toyota's revenues, operating income and net income. A strengthening of the Japanese yen against other currencies has the opposite effect. The Japanese yen has generally been weaker against the US dollar during fiscal 2002 and the second half of fiscal 2001 than in the respective corresponding periods

Table 1: Toyota's overseas manufacturing companies

Country/ Location		Name
Canada	1	Canadian Autoparts Toyota, Inc.
	2	Toyota Motor Manufacturing, Canada, Inc.
USA	3	Bodine Aluminium, Inc.
	4	New United Motor Manufacturing, Inc.
	5	TABC, Inc.
	6	Toyota Motor Manufacturing, Alabama, Inc. (2003)(plan)
	7	Toyota Motor Manufacturing, Kentucky, Inc.
	8	Toyota Motor Manufacturing, Indiana, Inc.
	9	Toyota Motor Manufacturing, West Virginia, Inc.
Mexico	10	A manufacturing company (official name is TBD)(2004)(plan)
Argentina	11	Toyota Argentina SA.
Brazil	12	Toyota do Brasil Ltda.
Colombia	13	Sociedad de Fabricacion de Automotores SA.
Venezuela	14	Toyota do Venezuela Compania Anonima
Czech Republic	15	Toyota Peugeot Citroen Automobile Czech (2005)(plan)
France	16	Toyota Motor Manufacturing France SAS.
Poland	17	Toyota Motor Manufacturing Poland SP.ZO.O(2002)(plan)
Portugal	18	Salvador Caetano I.M.V.T. SA.
UK	19	Toyota Motor Manufacturing (UK) Ltd.
Kenya	20	Associated Vehicle Assemblers Ltd.
South Africa	21	Toyota South Africa Motors (Pvt.) Ltd.
China	22	Sichuan Toyota Motor Co., Ltd.
	23	Tianjin Toyota Motor Engine Co., Ltd.
	24	Tianjin Fenjin Auto Parts Co., Ltd.
	25	Tianjin Toyota Forging Co., Ltd.
	26	Tianjin Toyota Motor Co., Ltd. (2002)(plan)
	27	Tianjin Jinfeng Auto Parts Co., Ltd.
Indonesia	28	P.T. Toyota-Astra Motor
Malaysia	29	Assembly Services Sdn. Bhd.
	30	T & K Autoparts Sdn. Bhd.
Philippines	31	Toyota Autoparts Philippines, Inc.
	32	Toyota Motor Philippines Corporation
Taiwan	33	Kuozuri Motors, Ltd.
Thailand	34	Siam Toyota Manufacturing Co., Ltd.
	35	Hino Motors Thailand Co, Ltd.
	36	Toyota Auto Body Thailand Co., Ltd.
	37	Toyota Motor Thailand Co., Ltd
Vietnam	38	Toyota Motor Vietnam Co., Ltd.
Australia	39	Toyota Motor Corporation Australia Ltd.
Bangladesh	40	Aftab Automobiles Ltd.
India	41	Toyota Kirloskar Motor Ltd.
Pakistan	42	Indus Motor Company Ltd.
Turkey	43	Toyota Motor Manufacturing Turkey Inc.

Source: www.toyota.com.

in the previous year. The Japanese yen strengthened against the US dollar during fiscal 2000 and the first half of fiscal 2001. In addition; the Japanese yen has generally been weaker against the euro during fiscal 2002 than during fiscal 2001, whereas the Japanese yen strengthened against the euro during fiscal 2000 and 2001.

Toyota is exposed to foreign currency risk related to future earnings or assets and liabilities that are denominated in foreign currencies. Toyota's most significant foreign currency exposures relate to the United States and Western European countries.

Toyota uses a Value-at-Risk analysis ("VAR") to evaluate its exposure to changes in foreign currency exchange rates. The VAR of the combined foreign exchange position represents a potential loss in pre-tax earnings that are estimated to be ¥25.2 bn as of March 31, 2001 and ¥24.0 bn as of March 31, 2002. Based on Toyota's overall currency exposure (including derivative positions), the risk during the year ended March 31, 2002 to pre tax cash flow from currency movements was on average ¥25.0 bn, with a high of ¥26.7 bn and a low of ¥22.9 bn.

The VAR was estimated by using a variance/co-variance model and assumed a 95% confidence level on the realization date and a 10-day holding period. Toyota changed the model used for calculation of value-at-risk from "variance/co-variance" method to "Monte Carlo Simulation" method, which it considers more effective for risk management purposes. The prior year amounts have been restated to the fiscal 2002 presentation.

Interest rate risk

Toyota is subject to market risk from exposure to changes in interest rates based on its financing, investing and cash management activities. Toyota enters into various financial instrument transactions to maintain the desired level of exposure to the risk of interest rate fluctuations and to minimize interest expense. Certain exchange traded futures and options contracts, interest rate caps and floors, along with various investments, have been entered into, to reduce the interest rate risk related to these activities. The potential decrease in fair value resulting from a hypothetical 100 basis point upward shift in interest rates would be approximately ¥38.3 bn as of March 31, 2001 and ¥28.3 bn as of March 31, 2002.

There are certain shortcomings inherent to the sensitivity analyses presented. The model assumes interest rate changes are instantaneous parallel shifts in the yield curve; however, in reality, changes are rarely instantaneous. Although certain assets and liabilities may have similar maturities or periods to repricing, they may not react correspondingly to changes in market interest rates. Also, the interest rates on certain types of assets and liabilities may fluctuate with changes in market interest rates, while interest rates on other types of assets may lag behind changes in market rates. Finance receivables are less susceptible to pre-payments when interest rates change. As a result, Toyota's model does not address pre-payment risk for automotive related finance receivables. However, in the event of a change in interest rates, actual loan pre-payments may deviate significantly from assumptions used in the model.

Commodity price risk

Commodity price risk is the possibility of higher or lower costs due to changes in the prices of commodities, such as non-ferrous (e.g., aluminum), precious metals (e.g., palladium, platinum and rhodium) and ferrous alloys (e.g., steel), which Toyota uses in the production of motor vehicles. Toyota does not use derivative instruments to hedge the price risk associated with the purchase of those commodities. Toyota controls its commodity price risk by holding minimum stock levels.

Equity price risk

Toyota holds investments in various available-for-sale securities, which are subject to price risk. The fair value of available-for-sale securities was approximately ¥718.6 bn as of March 31, 2001 and the fair value of available-for-sale equity securities was approximately ¥564.4 bn as of March 31, 2002.The potential change in the fair value of these investments, assuming a 10 % change in prices, would be approximately ¥71.9 bn as of March 31, 2001 and ¥56.4 bn as of March 31, 2002.

Reference # 15-03-02-12