

# **The Impact of a Ban on Mongolian Raw Cashmere Exports**

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## **Background**

Cashmere is an important product for Mongolia. It provides important cash income to Herders, accounting for about 18% of agricultural gross domestic product. Processing firms provide urban income by processing cashmere and manufacturing clothing and textiles for export to the luxury clothing market. The processing and clothing industries make up about 37% of industrial gross domestic product in the country. Altogether, the three stages of cashmere, production, processing, and clothing manufacture, account for about 15% of Mongolia's gross domestic product.

China is the world's largest producer of cashmere, producing about 10,000 ton per year, which is 67% of the world market. Mongolia is the second largest producer of cashmere behind China with about 3,000 tons per year or 21% of the world market. China's dominance in the world cashmere market was evident during the early 1990's when decentralization led to an oversupply of low quality cashmere. World prices of raw cashmere dropped and from about 60\$/kilogram in 1989 to 14\$/kilogram in 1993.

As world prices began to rise again in 1994, Mongolian processors became concerned about their own supply of raw cashmere and the Mongolian government imposed a ban on raw cashmere exports. World prices rose again to almost \$40/kilogram in 1995. Mongolian cashmere processors and manufacturers did well during the period of ban (1994-1996) and foreign investment expanded the industry. In 1996, the ban was lifted at the urging of the Asian development bank and other international aid and lending institutions. In addition, Mongolia would have had difficulty joining the World Trade Organization with a trade ban in place. Consequently when the ban was lifted, it was replaced with a 30% export tax in 1997. World prices for raw cashmere since have trended downward to a low of \$15/kilogram in 1998.

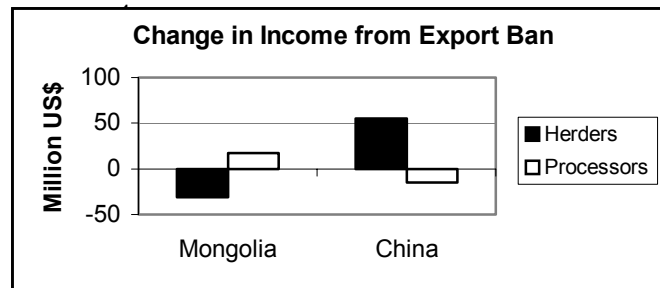
In 1999 a motion to re-institute the export ban on raw cashmere was narrowly defeated in parliament. Mongolian processors who advocated the ban had become concerned about increasing exports of raw Mongolian cashmere to China that deprived them of raw material for production. While the first half of 1999 recorded over 600 tons exported to China, many feel that another 600 tons was exported illegally without payment of the 30% export tax. As Chinese buyers bid up the price, many Mongolian processors stopped buying, leaving some of them with inadequate supplies for a full year's production. The Mongolian processing industry has the capacity to process all of Mongolia's 3000 tons production of raw cashmere but this year perhaps up to 40% may have been exported to China. Those supporting the re-institution of the ban assume that the prosperous times during the previous ban will return for processors and ultimately for the herders.

In general, trade policies such as export taxes or outright export bans or quotas can be used to discourage exports. Alternatively, subsidies or reduced taxes can be used to encourage domestic industries to compete with foreign buyers for domestic raw materials. If the policy objective is to encourage the use of Mongolian raw cashmere in Mongolia, a total ban on exports of raw cashmere is the most extreme policy available. Currently a 30% export tax on raw cashmere does discourage exports. If domestic processors can not pay as much as the Chinese for Mongolian raw cashmere, the government could subsidize purchases (directly, or by, for example, making low cost loans to processors for the purchase of raw cashmere). Tax holidays for processors could also be used to lower their costs, allowing them to meet Chinese prices. The clothing sector could receive the same treatment to encourage them to buy more processed Mongolian cashmere, which in turn, leads processors to buy more raw cashmere. Alternatively, the government could let the free market determine trade in cashmere and cashmere products, forcing processors to compete with Chinese buyers. This report helps policy makers ponder a cashmere export ban by analyzing its potential impact, including some impacts not usually considered. Some alternative policies are also analyzed that address the cashmere supply question, including economic actions that can not be affected by Mongolia. Finally, some policies and programs that might benefit the cashmere industry are discussed in general terms.

## The Impact of a Mongolian Ban on Raw Cashmere Exports

### Economic

If a ban were imposed in 1999, Mongolian processor purchase costs would decline, boosting their profits and competitiveness in the international market. Processor income could increase by 26% or 17 million US\$ in the long run. On the other hand, herder income would decrease significantly, 51% or \$31 million. The ban per se does lead to \$4/kilogram increase in raw cashmere prices outside of Mongolia in the long run, but not for Mongolian herders. Besides Mongolian processors, the other main beneficiaries of a ban would be Chinese herders who would see a 27% (\$55 million) increase in their income (see Table 1). The Mongolian government would lose about \$7 million in tax revenue since the \$8 million loss from the export tax would not be offset by the additional \$1-2 million collected from increased processor income.



Difficulty in collecting all of the current export tax suggests that an export ban would be difficult to enforce. The profits from circumventing a ban would be high since a full ban might drive the Mongolian purchase price of raw cashmere down to 10\$/kilogram while the purchase price in China would be driven up to about 24\$/kilogram. If the avoidance of the current export tax of \$4/kilogram leads to illegal exports to China, a price differential more than 3 times as high could make a ban very difficult to enforce.

Although raw and processed cashmere prices have cycled in the past, there seems to be nothing associated with the ban that would almost triple raw cashmere prices, as was the case from 1993 to 1995, the period of the previous ban. Since Mongolia provides about 20% of world supply, a tripling of world prices most likely would have to come from actions or events in the world market outside of Mongolia. 1993-1995 for example, saw rapid world economic growth that probably resulted in very strong global cashmere demand.

### Political

Herders and their families who constitute over 40% of the population would not like the ban because of the severe decline in their income, and they could likely react politically as they did when the first export ban was imposed. In other countries, policies that have adversely impacted groups have had important political effects. In the United States an agricultural export ban imposed by President Carter was very unpopular with farmers and this contributed to his defeat in a re-election bid. Part of the political problem is that a trade ban is a very visible policy action and U.S. farmers attributed all of their economic problems to the ban. In the U.S. "no more embargoes" is still a political rallying cry for farm groups.

### International

An export ban would raise serious difficulties with the World Trade Organization (WTO) as well as with various international organizations that have current or planned projects in Mongolia. These institutions strongly encourage the development of market economies with appropriate policies and institutions. They strongly discourage direct market control policies such as export bans. Tax/subsidy policies are preferred since they can achieve policy objectives using the market price mechanism rather than circumventing it. In addition, if a processing or other industry in a WTO member country were injured by the ban, a complaint could be lodged with the WTO and ultimately; Mongolia could face compensatory trade sanctions.

## **Analysis of Other Policies that Directly Impact Mongolian Raw Cashmere Exports**

### **Better collection of export taxes**

The current export tax does discourage the exports of raw cashmere. However, an estimated 50% of exports to China avoid the export tax. If the all of export tax collection was collected, exports to China might decline by a 33%. Procurement prices would decline by 14%, increasing processor incomes by 6%. Government tax revenue from the cashmere sector would increase by 4% or \$1million. Of course herder income in Mongolia would decline by 16% while herder income in China would rise by 5% in the long term, an impact similar to the export ban but a third less in magnitude (see Table 2).

The long border with China coupled with an incentive to avoid taxes, makes smuggling profitable, tax collection difficult, and encourages corruption. A customs technical assistance and training program could help to improve export tax collection. In addition, long-term cooperation with China on smuggling and other border issues might begin. With support from other countries, Mongolia might incorporate border enforcement cooperation with China into China's accession agreement to the World Trade Organization or into a Mongolian-Chinese agreement. To the extent that Chinese processors need longer Mongolian cashmere fibers to mix with their own cashmere and seem willing to pay premium prices for it, some kind of agreement might be considered where continued Mongolian exports to China is contingent on export tax collection; this might encourage Chinese cooperation in preventing smuggling.

### **Cashmere quality improvement**

There are wide ranges of prices of cashmere products associated with product quality and design. Higher quality processed cashmere and cashmere products should bring higher prices for herders and producers in world markets. An emulation of a gradual 10% quality improvement program might suggest that incomes of Mongolian herders and processors might increase 11% or more in the long-term and increase incomes of manufacturers 18% (see Table 6). Even though 4% more raw cashmere is exported, incomes increase for all groups in Mongolia. This strategy is an example of a market oriented strategy where Mongolia would improve its performance to take advantage of the market rather than trying to control the market with an export ban that would hurt Mongolian herders while helping Mongolian processors.

To improve quality, Mongolia could institute breeding programs, cull older goats that produce lower quality down, and develop marketing programs that reward better raw cashmere quality. Better overseas market information could help processors and manufacturers capture more of the high end of the world cashmere market for processed cashmere and cashmere products.

### **Better situation and outlook information**

Many countries have a situation and outlook information system for their major agricultural products. Domestic and world market conditions are monitored and made available to producers and processors. The development and use of, or participation in, a world cashmere outlook information system would be helpful to both processors and herders. Forecasts could help them know what prices to expect for their future production decisions. Currently, some information seems to be occasionally available privately, but public information would give everyone a fairer chance to compete in the marketplace. Better world situation and outlook information on cashmere supply and demand requires the cooperation of China, Mongolia, other producing countries, and the large cashmere product manufacturers in the rest of the world.

As an illustration of the impact of increased world demand for cashmere products, a scenario was run where world growth rates were expected to pick up 1% per year over current projects (see Table 4). In addition, a cycle of increased demand for cashmere products in the world was assumed. This scenario resulted in long-term income increases for Mongolian herders, processors, and manufacturers of 11, 18, and 31 percent, respectively. This analysis shows how important it is to know when world demand picks up so that Mongolian processors and manufacturers can prepare to take advantage of it and not lose out to foreign competition.

Mongolia would benefit most if Mongolians set up a modest situation and outlook program, perhaps in an independent agency or at a university. The goal would be for Mongolian economists to know the numbers, assemble the data, and perform analyses like the one in this report for cashmere and other agricultural products important to Mongolia.

### **Good general economic policy**

Attention should be paid to general economic conditions in Mongolia and China, which can impact cross border trade. Rapid inflation in Mongolia early in this decade coupled with low inflation in China may have given Chinese buyers an advantage over Mongolian traders. Cash trade and bartering are more difficult in high inflation situations if there are explicit or verbal contracts for the sale of Cashmere. Mongolian policies to bring and keep down inflation would be helpful to all sectors of the Mongolian economy, including cashmere.

Another example; it is possible that this year's large Chinese purchase of Mongolian cashmere might partially be in response to a rumored Chinese devaluation. According to the financial press, Chinese currency devaluation is becoming more likely as Chinese exports are becoming less competitive compared to other Asian exporters. If a significant Chinese devaluation were to occur this fall, Mongolian cashmere would become more expensive to Chinese buyers, leaving more of the market to Mongolian processors in coming years. However the benefits of Chinese currency devaluation for Mongolia would be mixed. An experiment with a 210% Chinese devaluation suggests that while Mongolian raw cashmere exports might decline by 6%, herder and processor incomes might decline by 5% and 3%, respectively (see Table 5). Management of the Mongolian economy, including any impacts of policy changes by major trading partners, requires a good knowledge of the macro economies of those partners. Devaluation by another country that impacts one's own trade is a problem that can not be controlled by Mongolia but if anticipated, adverse impacts can be minimized.

### **Removal of unfair practices by China in the cashmere trade**

Many believe that Chinese processing industries are subsidized through low interest loans or direct subsidies or inadvertently through the administration of Chinese industry. It is difficult to tell what would be a subsidy in the Chinese system, but if China's application to join the WTO were accepted, then there would be an international body to complain to if evidence of a subsidy was found. A scenario was run which assumed that China removed a hypothetical 10% subsidy to Chinese processors (see Table 7). The results of the removal were mixed for Mongolia; processors increased their incomes by 6% but herder and clothing manufacturers incomes decline by 1%. So even if evidence of Chinese subsidies were found and the subsidies were removed by international pressure, not all parts of the Mongolian cashmere industry would benefit. This illustration shows the complex impacts of policies in that is there are Chinese processor subsidies, they benefit Mongolian herders and cashmere clothing manufacturers.

### **Free the raw cashmere market completely by removing the export tax**

Mongolia could decide to free the cashmere export market by gradually eliminating the export tax. This is eventually required under the accession agreement with WTO. A scenario was run assuming the export tax on raw cashmere was gradually eliminated, following the agreement with WTO, which says the export tax, should be fully removed in 10 years (by 2007). Removal increased herder income by 16% while processor income declines by only 5% (see Table 3). There was little impact on cashmere clothing manufacturing sales. Government tax revenues from the cashmere sector, however, declined by 7% or \$2 million per year in the long term.

### **Encourage more competitive expansion of the Mongolian textile and clothing industry**

If tax policies or marketing programs or other cost effective devices could be found to encourage expansion of the Mongolian textile and clothing industry, Mongolia would benefit by providing more jobs and income from cashmere in the country. Since cashmere products are lightweight and compact, low transport costs

give them relatively low cost access to world markets. A scenario was run which assumed an 18% per year expansion of this industry in Mongolia in a competitive manner. The results are rather striking. Herder, processor, and manufacturer incomes increased by 7%, 12%, and 155%, respectively, over the long run (see Table 8). The competitive expansion means that Mongolian cashmere clothing manufacturing expands partially at the expense of manufacturers in China and the Rest of the World. Exports of raw cashmere were unchanged but exports of cashmere clothing double in volume and increase by 181% in value while exports of processed cashmere decrease by 51% as more of the processed Mongolian cashmere is used in Mongolian clothing and textile factories. Government tax revenues rise 19% in the cashmere industry, mostly from the processing and manufacturing sectors. This scenario shows the benefit for all of competitive in-country expansion up the value-added chain in contrast to policies that help some sectors and harm others.

### **Other Policies That Might Benefit the Mongolian Cashmere Industry**

#### **Extension improvement**

Improve the access of herders to knowledge about quality problems and possible improvements that they can make. Many countries use periodicals and radio and television programs for this purpose. Some countries have government staff in rural areas (extension agents) whose job is provide technical and economic information to producers. Mongolian herders might benefit from activities along this line suited to country conditions. Similarly, ways need to be found to get information on rapidly changing market trends, styles, prices, etc. to processors and manufacturers so they can plan future production and respond quickly to changing market conditions. Product trade publications serve this purpose and increasingly, electronic media such as the Internet are used to pass information quickly. Arrangements with overseas buyers are also a way to obtain this information. Since many Mongolian processors and manufacturers are small in a global context, they should be able more rapidly to changing market conditions than very large companies, provided they are aware of coming changes.

#### **Publicity about Mongolian Cashmere**

Besides improving the quality of Mongolian cashmere, every effort should be made to publicize that quality. During the 1980's when China decentralized their decision making, the quality of their cashmere declined, foreign sales dropped, and lower quality cashmere was subsequently overproduced in the early 1990's. A study by the Economist Intelligence Units stated that the drop in quality seriously damaged the world cashmere markets. World cashmere buyers became interested in other sources of high quality cashmere, including Mongolia. Mongolia stands to benefit long-term in the volatile world cashmere market by consistently producing and publicizing a high quality product.

One idea is to create an independent testing laboratory for cashmere quality in Mongolia, which certifies quality. A "quality mark" system might be created for Mongolian cashmere so that the world would know that unless their product had this mark, it was not high quality Mongolian cashmere.

Processors and textile and clothing manufactures should also consider direct advertising, if not direct marketing over the Internet. Increasingly, consumers are buying quality products over the Internet or at least they are learning about them. An Internet web site is a relatively cheap way to provide advertising and information about a product to the entire world. It also might be feasible to take orders for some kinds of cashmere items on the Internet and ship them out by air.

#### **Financing for processor purchasing of raw cashmere**

There have been complaints from some processors that they can not get adequate financing for the purchase of raw cashmere during the buying season. To the extent that this is true, Mongolian processors would be at a disadvantage compared to Chinese traders who seem to have adequate cash for the purchase of raw cashmere from Mongolia. Work with the banking system would be needed to solve this kind of problem.

### **Develop markets for other products from goats**

While cashmere is an important income source for herders, other products such as meat and hides can also be sold, supplementing the herder's income. Programs that bought Mongolian meat and hides up to exportable standards would be useful. For example, China is trying to increase protein consumption and goat meat is one of the consumption products it is encouraging. It is said that currently the Chinese standards for imported meat are not met. Programs to bring meat and hide qualities up to trade standards would be useful.

### **A more open marketing process for raw cashmere**

Mongolia could develop a more open and orderly process for marketing cashmere. If herders or their representatives could meet with Mongolian and Chinese buyers in an open process, such as an auction, herders could try to get the best price and buyers could try to get the best quality at the lowest price. A cashmere market with open sales to foreign buyers would also help government tax collectors know who should be paying the export tax. It would be an additional step that could improve export tax collection.

### **Summary**

In summary, Mongolia is dependent on world market for exports of processed cashmere and cashmere product; this fact can not be avoided. Cashmere is a national asset only because of its value in foreign markets. This means that many economic events or changes that impact the Mongolian cashmere industry are outside Mongolian direct control, including those in the main large competitor, China. Ultimately, policy actions in other countries that impact Mongolia adversely through trade will have to be handled in the World Trade Organization (which was created for exactly this kind of problem). The linkage of Mongolia to world markets also means that changes in Mongolian cashmere policies work through these world markets, sometimes in ways that offsets the policy's intent. Therefore careful analysis is useful when policy changes are debated.

Given the large world market for cashmere products, Mongolia has a great potential to capture the higher quality ends of the global market with efficient production and good marketing. Here Mongolian cashmere can be even better than gold. The world cashmere market has experienced quite wide swings in prices in the past. However being a relatively small supplier to the world market, Mongolia should be able to respond faster than other suppliers to catch the market upturns when they occurs.

Ultimately Mongolians will determine the future of their cashmere industry. Their policy choices, agricultural and animal husbandry practices, marketing and management skills, and knowledge of the world market with its ups and downs will ultimately determine the fate of the Mongolian cashmere industry. I am sure that Mongolians are very capable of meeting the challenge. Hopefully this report will be of help in further discussions of policies for the cashmere industry in Mongolia.

## Methodology Used in This Report

In order to assess the impact of an export ban, two activities were undertaken. First, the author met with many people to hear their views on an export ban and on problems in the Mongolian cashmere industry. A wide range of people had divergent views on the subject. They included Members of Parliament who favored and opposed the ban, processors who also were on both sides of the issue, government officials who offered the international perspective on the subject, agricultural exports, and traders. Second, a simple economic model of the world cashmere market was constructed to assess the possible economic impacts of a ban on Mongolian exports of raw cashmere. The model was also used to assess other policy options.

## Summary of Interviews

Supporters of a ban on cashmere exports point out that a ban existed from 1994 to 1996 and that during that period, considerable foreign investment moved into the Mongolian cashmere processing business. Supporters reason that another ban will again revive the cashmere processing industry. Currently (1999) Mongolian processors have the capacity to process all of the cashmere produced in Mongolia but are short of supply because Chinese buyers have purchased 640 tons (recorded by customs) and perhaps as much more through smuggling. This could amount to 40% of the estimated 3000 tons produced in Mongolia this year. Supporters also argue that a ban is easier to enforce since thorough inspection of cashmere is difficult. With a ban, any cashmere is simply confiscated and detailed inspection and tax collection is not necessary. Finally, supporters argue that based on experience with the past ban, Mongolian cashmere purchase prices would eventually rise and the herders would more that recover any income lost to the imposition of a new ban.

An oft-cited reason for the ban was that Chinese processors and their buyers in Mongolia were subsidized, making it hard for Mongolian processors to compete on a purchase price. Several believed the Chinese conspired to deprive Mongolian processors of raw materials and drive them out of business. They believe that China will lower the price for Mongolian cashmere, thus hurting herder's income in the longer run. The demise of the Mongolian leather industry is cited as evidence of this pattern of predatory business practices by Chinese industry.

Opposition to a cashmere export ban occurs for many reasons. The Asian Development Bank, the World Bank, and other institutions objected to the earlier ban and this led to its cancellation in 1996. A 30% export tax was substituted in 1997 with the provision that it should be phased out in 10 years. Opponents say that a re-imposition of the ban would raise serious political problems with donor organizations whose work is important for the transition to a market economy. Mongolia needs development projects and foreign investment in to re-ignite strong economic growth.

Others oppose the ban because it would decrease the income of herders, one of the poorest segment of the population. Herders also could react politically in upcoming elections to those supporting a ban of cashmere exports. Many opponents stated that a ban would not be enforceable and that if enforcement were stepped up, it would be better to concentrate on the cashmere export tax, which raises revenue. Many worried about the corruption that would be encouraged by profits available to those circumventing a ban.

Some opponents simply see the ban as a scheme by Mongolian processors to get cheap raw cashmere and avoid improving production efficiency and markets skills necessary to compete in world markets. Many opponents strongly believed that the herder should simply sell to the highest bidder to maximize their income.

Proponents and opponents of the export ban strategy agree on many other important issues. For example, the export tax would be much more effective and helpful in keeping raw cashmere supplies in Mongolia if it were fully enforced. Most acknowledge a decline in the quality of Mongolian cashmere over a decade. Most know that the main reason for Chinese purchases is to mix the longer Mongolian fibers with their high quality shorter fibers to maintain yarn strength. Many feel the Mongolian cashmere buyer's playing

field is not level because of Chinese strategy or subsidies or inadvertent behavior and that a policy response such as an export tax is necessary for the present.

Most would support programs to improve the quality of Mongolian cashmere. People mentioned the “too many old goats” problem. Older animals produce lower quality cashmere. Disease problems and the collapse of the Russian meat market diminished goat slaughter. Anything that could be done to market products of older animals would automatically improve cashmere quality. In addition, many mentioned that breeding programs would improve quality over time.

Some processors do their own marketing, others rely on traders. Several people hoped a better marketing system could be developed that would give herders and processors better opportunities. Some feel that herders are taken advantage of by traders in general (Chinese and Mongolian) and that auctions or cooperative sellers or some improved marketing scheme would be fair to all.

Many mentioned a credit problem for some Mongolian processors; they had difficulty in obtaining the short-term credit needed during the procuring season. Some mentioned that some of the first stages of processing could be done locally, thus placing a permanent processor’s presence nearer rural cashmere producing areas.

#### A Simple Model of the World Cashmere Market

In order to assess the possible impact of an export ban and other policy alternatives a model and associated set of data was created. The world was divided into Mongolia, China, and the Rest of the World (other cashmere producers such as New Zealand, Nepal, Iran, etc. and markets for processed cashmere and cashmere products, especially in Europe and North America). The cashmere industry was broken into three major parts, raw cashmere gathered by herders, processed (dehaired) cashmere traded throughout the world, and final cashmere products including yarns, clothing, etc. A cashmere supply and utilization table was constructed using published data, unofficial estimates, author estimates, and adding-up relationships (e.g. production = consumption – exports + imports). The supply-utilization table becomes the base data for a simple economic model where assumptions are made about producer and consumer response to price changes. Production relationships (such as 2 kilos of raw cashmere yield 1 kilo of dehaired cashmere) are implicitly incorporated into the model and hold true in various policy scenarios. The model is based in 1999 and projects out to 2010. While predicting the future is always uncertain, the main technique used is to measure the impact of policy changes relative to a baseline projection, abstracting from the general direction of the baseline itself. Economic impacts are presented as short-term (1 years – 2000 in the CASH model), medium-term (4 years - 2003), and long term (11 years - 2010) after all of the policy impacts have worked through world markets. Many policy changes are introduced gradually, reflecting the time need for changes to be instituted and to take effect.

Economic models of markets summarize their workings. Quantities in the model are measured in tons, and representative average prices are used even in the case of cashmere clothing (where there are actually a wide range of prices and type of clothing). The hope is that the simple characterization in the model roughly captures the main economic behavior and values associated with the markets.

The base situation uses 1999 data, the last year for which enough data is available to construct a crude model. 1,150 tons of raw cashmere was estimated to be exported, presumably most of it to China. The baseline assumes that only 50% of the export tax was collected. This assumption allows experiments with the improvement of export tax collection. Note that current year estimates of exports to China go up to 1200 tons with about half being taxed. Herder supply response is assumed to occur gradually over 4 years in all regions while processors and consumers are assumed to adjust to market changes each year. The model clears the world market for each cashmere product group each year. The model is constructed and simulated in an Excel spreadsheet by the VORSIM model building framework. An overview of the VORSIM system can be obtained on the Internet at the VORSIM website: <http://members.aol.com/vorecon/vorsim.html>. The model (named CASH) is technically a partial-equilibrium synthetic model meaning that the effects of related markets are not considered and that model



coefficients are a combination of economic theory, modeling experience, and the modeler's judgment. Documented model details as well as supporting data and calculations are given in appendices to this report. For comparative purposes, scenarios are presented in terms of changes from the base in a standard table.

The structure of the model and its supporting data roughly assumes that raw cashmere now goes from Mongolia to China but that there is only limited trade in raw cashmere between China and the Rest of the World. The model assumes that most trade is in processed cashmere and cashmere products. The current specification of the model deals with disturbances in the raw cashmere market mostly by changes in world prices of raw and processed cashmere as well as trade in these materials. Disturbances in the final product market do transmit downward to the processed and raw cashmere markets. Market forces are assumed to ultimately prevail in production and consumption decisions, even in China.

Various scenarios were run and compared with a base scenario. These results appear in tables of model scenarios in the next section, preceded by a brief explanation of the supply and demand economics behind the CASH model.

As is the case with any analytical tool, the CASH model could always be improved with better data and improved coefficients. It is important that readers knowledgeable about the Mongolian, Chinese, and world cashmere industry offer their comments on the reasonableness of the results and the data behind the model, especially the data on cashmere supply and utilization in Table A3 in the Appendix. If some of results seem to large or small, model coefficients can be altered. Also, the author is especially interested in the characterization of the total value of the Mongolian raw cashmere, processed cashmere, and cashmere clothing sectors in the cashmere industry. Finally, better trade information from China would be helpful in better determining the ratio between trade and domestic consumption in the Chinese processing sector.

Nevertheless, the CASH model shows that it quite feasible to do a complex analysis of an industry even if information is limited or imperfect. The partial equilibrium analysis done in this report is standard procedure for empirical economists. Even if modeling efforts raise questions, creators of models and users of the analysis of economic models learn very much about the markets they are studying and they can make better economic policy because of the knowledge they gain.

The CASH model and detailed solutions results reside on a computer at the Gobi Regional Economic Growth Initiative. Questions about this report and analytical results should be directed to Susan Hahn at:

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# Appendices

Appendices contain model documentation, the major world cashmere supply and utilization constructed for the analysis, and tables and charts of supporting data for the model activities. Tables A1-A4 contain the basic data used to assemble the CASH small world cashmere market model. The base prices used are found in Table A1 while data in Tables A2 and A4 were used for the construction a world supply and utilization table (Table A3). Supply and utilization tables are standard tools for the analysis and tracking of commodities. They are especially important because they include accounting relationships, which must hold true (e.g. world production must equal world consumption plus carryover changes). Relationships allow a researcher to fill in some of the blanks when data is missing, as was the case with cashmere information in China and the world as a whole. If production and trade is known, for example, then consumption can be estimated as a residual.

While the supply and utilization table represents the author's best estimate of world supply and demand, given available information, data on world trade, Chinese trade, etc. could greatly increase the accuracy of the data in Table A3. The supply and utilization table provides the base data for the synthetic model CASH, a world cashmere market model. The model is constructed using the base data estimates for 1999 in Table A3 as well as prices from Table A1. The model adds supply and demand parameters, which gauge how much and how fast producers and consumers respond to price changes (supply and demand elasticities in economic jargon). With some tax revenue calculated for Mongolia and exogenous income, population, and manipulation variables added, the model can be used for the calculation of scenarios over time.

The CASH model starts from 1999 and projects out to 2010. The base scenario is set so that cashmere quantities and prices grow slowly from 1999 levels, reflecting that fact that quality cashmere production is limited on a world basis. In Mongolia, for example, there are grazing limits and herd mixture balance (between sheep and goats) that must largely be maintained for sustainable cashmere production.

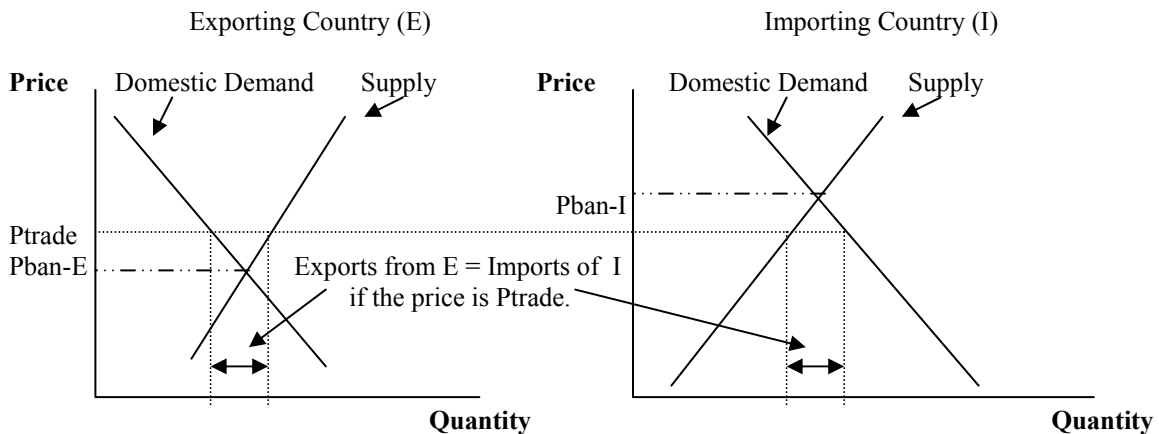
The model is used to calculate various policy and economic scenarios out over time. The results can be compared to the base projection.

CASH was created with the VORSIM model building system, which allows the construction and maintenance of models in the Microsoft Excel spreadsheet. A full printout of the CASH model definition, variable list, parameters and equations, and data follows Table A4. CASH is a synthetic model meaning that parameters are taken from studies of similar products. There is not enough data available in Mongolia to estimate model parameters with econometric techniques. Nevertheless, economic theory is used to mold and relate some of the model parameters so that in economic terms, CASH behaves, as economic theory would expect. The real question in such a model always is are the model parameters and results reasonable? The answer to this question depends upon the judgement of those who read the model results. If model behavior is questioned, parameters can be modified and scenarios can be re-run. Most importantly, if price data is found wanting, some of the resultant model values may appear too large or small. The magnitudes of results can be changed if the based data changes although the direction of change may stay about the same. Model parameters such as elasticities govern how much things change in response to policy changes; again different parameters can generate somewhat differing results.

An economic model is a collection one's best data and assumptions about a situation and as such it can always be improved. The reader of model results should not look for accuracy, but rather should learn from model results, question them, and hopefully improve their understanding of a problem.

In the CASH model when policy or economic changes are introduced, world prices clear world markets every year for raw cashmere, processed cashmere, and cashmere clothing. These world price signals feed back to countries, determining their supply and demand. Mathematically, the CASH model is a system of simultaneous equations describing world cashmere markets, which are solved every year.

Figure 1 – The supply and demand for raw cashmere



With open trade between countries E and I, the same price ( $P_{trade}$ ) prevails in both countries and at that price, excess supply from E is exported to I. However, if an export ban is imposed in E, supply must equal demand in both countries without any trade.

With an export ban, the price in the exporting country E is lowered to  $P_{ban-E}$ . In country I, the price has to rise to  $P_{ban-I}$  to clear that market. This means that producers (i.e. herders) in E now get a lower price and produce less while buyers purchase more at the lower price  $P_{ban-E}$ . Producer's income falls because they get a lower price and sell less. Purchasers in E pay a lower price and buy more cashmere than they did under the open trade situation. The buyers' income, however, depends not only on the lower price paid for cashmere, but also on the prices they can get for their processed product. Graphically, this would require another set of diagrams like the above ones for processed cashmere.

In country I, the price has to rise to  $P_{ban-I}$  which raises the income of the producers (herders) in I since they receive a higher price and sell more cashmere. The buyer (processor) in country I has to pay more and buys less cashmere. Again, to determine the impact on the buyer's income in I, another set of diagrams would be required. In general, the change in income for buyers in both countries depends not only on the price they pay for raw cashmere, but also on the market conditions for their processed products.

Note that if the government in E imposed an export tax exactly equal to  $(P_{trade} - P_{ban-E})$  so that buyers in country I would have to pay  $P_{ban-I}$  ( $P_{trade} + \text{export tax}$ ), then they would stop importing and the same market conditions would exist in both countries as would be the case with the export ban in place. An export ban has the same impact as a prohibitive export tax.

If country E imposed an export tax less than the prohibitive ( $P_{trade} - P_{ban-E}$ ), then some exports would go from country E to country I. The government in country E would collect some tax on the exports.

The above diagrams can also be used to analyze other policies. For example, if the demand in country I decreased due to a removal of a processor subsidy (shifting the demand line down), less cashmere would be imported and the price would fall (lower than  $P_{trade}$ ) in both countries until exports from country E again equal imports of country I. Producer income in E would fall, as would processor raw material costs.

The CASH model used to analyze the world cashmere market is like the above diagram except that three countries/regions (Mongolia, China, other countries) are involved with three products (raw cashmere, processed cashmere, cashmere products). This more complicated situation would require 9 supply-demand diagrams with complicated relationships between them (e.g. the demand for raw cashmere depends upon the supply needs of the processor, which in turn, depends on the supply needs of the clothing manufacturers (in all three regions), which in turn depends upon the demand conditions for the final product in all three regions. The analysis of this problem requires a set of simultaneous equations, i.e. the model CASH.

# Model Scenarios

Several CASH model scenarios follow. A brief explanation will help the reader interpret them. The economics of supply and demand for cashmere for an exporting country are shown in Figure 1 on the following page, including explanations about the economics behind the simple supply and demand diagrams. The CASH model is like the diagrams except that many more markets and relationships are included. The data and model documentation are given in the Appendices.

The model simulation process goes as follows: When a model is built, a baseline is generated; a baseline is a projection with the model that is reasonable and is not influenced by any policy or unexpected economic changes. Then policy or economic scenarios are run where the model makes a different set of calculations for supply, demand, trade, and prices in response to the policy changes. Each of these scenarios is compared to the base projection. Results are presented for short, medium, and long-term effects compared to the base projection. This allows the comparison of scenarios with a common reference point.

Each table contains a simulation scenario. The first page presents results for a scenario compared to the base projection in terms of differences and percentage differences. Some of the major results for the scenario are summarized in a box. The second page of the each table contains the actual scenario and base data generated by the CASH model. The third page shows major results in graphical form.

Readers should regard some of the value magnitudes (i.e. million \$) with care as they are calculated with representative prices for the raw cashmere, processed cashmere, and cashmere clothing sectors. The representative prices used seem reasonable and give reasonable “value” results for sectors; however, they can always be improved. The calculation of a representative price is a difficult problem, especially for the clothing industry, which generally measures quantity by pieces of a large mix of products. Economic analysis requires simplification and averaging if it is to be done at reasonable cost.

Note the CASH model is a net trade model meaning that it generates only exports minus imports (net trade). Exports and imports are not shown separately. For Mongolian raw cashmere, which is the focus of this study, this is no problem because almost all raw cashmere is exported to China and little or none is imported. The real problem here is that the amount of exports is uncertain since some cashmere is exported illegally. The CASH model was initialized used the best estimates available of Mongolian production and trade. For both Mongolia and China, some data was available from country statistical sources; other data was estimated from various sources including interviews. The Appendix tables document some of the statistical sources.

Not all of the model information is presented in these scenario summary tables. Only major results of economic interest are presented. However all model data and parameters are printed in the Appendices. In addition, the GOBI Regional Economic Growth Initiative has the CASH model Excel files with all of the detailed simulation results.

## List of Tables Containing Model Simulation Scenarios

- Table 1 – The Impact of a Mongolian Export Ban on Raw Cashmere
- Table 2 – The Impact of the Full Collection of the Mongolian Export Tax on Raw Cashmere
- Table 3 – The Impact of the Removal of the Mongolian Export Tax on Raw Cashmere
- Table 4 – The Impact of Increased World Economic Growth and Cashmere Demand
- Table 5 – The Impact of a 20% Chinese Currency Devaluation on the Cashmere Sector
- Table 6 – The Impact of a 10% Increase in Quality-Led Mongolian Export Prices
- Table 7 – The Impact of the Removal of a Hypothetical 10% Chinese Processor Subsidy
- Table 8 – The Impact of a Successful Expansion of the Mongolian Cashmere Clothing Industry

**Table 1 - The Impact of a Mongolian Export Ban on Raw Cashmere**

Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World		
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Income of Herders	M\$	-16	-30	-31	20	53	55	3	8	8
	%	-28%	-53%	-51%	11%	28%	27%	11%	28%	27%
Processed Cashmere Sales	M\$	6	14	17	-5	-12	-15	-1	-2	-2
	%	12%	27%	26%	-2%	-4%	-4%	-2%	-5%	-5%
Manufactured Product Sales	M\$	0	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Quantity Raw Cashmere Prod.	t	-55	-277	-286	58	307	317	8	45	46
	%	-2%	-9%	-9%	1%	3%	3%	1%	3%	3%
Quantity Proc. Cashmere	t	113	263	268	-100	-229	-232	-15	-34	-34
	%	12%	27%	26%	-2%	-4%	-4%	-2%	-5%	-5%
Quantity Cash. Manuf. Goods	t	0	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Raw Cashmere Price	\$/kg	-5	-9	-9	2	5	4	2	5	4
	%	-27%	-48%	-46%	10%	24%	23%	10%	24%	23%
Processed Cashmere Price	\$/kg	0	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Average Manuf. Good Price	\$/kg	0	0	0	0	0	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Export Value of Raw Cashmere	M\$	-12	-21	-22	<p style="text-align: center;"><b>Comments About This Scenario</b></p> <p>EXPORT BAN - This scenario assumes a cashmere export ban with increasing enforcement so that exports cease by 2010. The selling price for the herder and the buying price for the Mongolian buyer drops by 46% in the long-term. Mongolian herder income drops 51% while Mongolian processor income increases 26%. In China, the opposite effect occurs; the income of Chinese processors decreases 4%. But herder income in China increases by 27%. The impacts in the Rest of the World are about the same as in China.</p> <p>Mongolian tax revenue from the cashmere sector drops about 20% or 7 million U.S. dollars in the long-run. While exports of raw Mongolian cashmere stop, exports of processed cashmere increase 34% in value and 35% in volume. Income in the clothing sector in Mongolia and other countries does not change.</p> <p>Mongolian processors and Chinese herders gain while Mongolian herders lose in this scenario.</p>					
	%	-52%	-99%	-100%						
Export Value of Proc. Cashmere	M\$	6	14	17						
	%	16%	36%	34%						
Export Value of Manuf. Goods	M\$	0	0	0						
	%	0%	0%	0%						
Export Quant. of Raw Cashmere	t	-405	-1121	-1138						
	%	-35%	-97%	-100%						
Export Quant. of Proc. Cashmere	t	114	263	268						
	%	16%	36%	35%						
Export Quant. of Manuf. Goods	t	0	0	0						
	%	0%	0%	0%						
Tax Revenue:										
Raw Cashmere	M\$	-6	-8	-8						
Proc. Cashmere	M\$	1	1	2						
Cashmere Prod.	M\$	0	0	0						
Total Tax Revenue	M\$	-5	-7	-7						
	%	-18%	-23%	-20%						

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.

**Table 1 - The Impact of a Mongolian Export Ban on Raw Cashmere**

**continued**

<u>Scenario (s), base (b)</u> <u>model numbers</u>	<b>Mongolia</b>			<b>China</b>			<b>Rest of World</b>			
	<u>Short</u>	<u>Medium</u>	<u>Long</u>	<u>Short</u>	<u>Medium</u>	<u>Long</u>	<u>Short</u>	<u>Medium</u>	<u>Long</u>	
Income of Herders	s M\$	41	27	30	210	244	258	30	35	37
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	53	66	82	277	293	355	35	37	45
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	26	32	48	335	383	509	506	582	780
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2938	2788	2895	10018	10499	10894	1453	1522	1580
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	1042	1227	1301	5485	5461	5658	692	689	719
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	220	240	286	2807	2880	3030	4239	4370	4645
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	14	10	10	21	23	24	21	23	24
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	50	54	63	50	54	63	50	54	63
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	119	133	168	119	133	168	119	133	168
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	10	0	0	-17	-4	-3	2210	6735	6866
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	42	54	65	136	141	171	-178	-194	-236
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	22	27	41	267	303	396	-289	-330	-437
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	750	30	1	-803	-174	-146	53	144	144
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	826	997	1043	2694	2620	2724	-3520	-3617	-3767
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	180	200	245	2238	2275	2358	-2419	-2475	-2603
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603

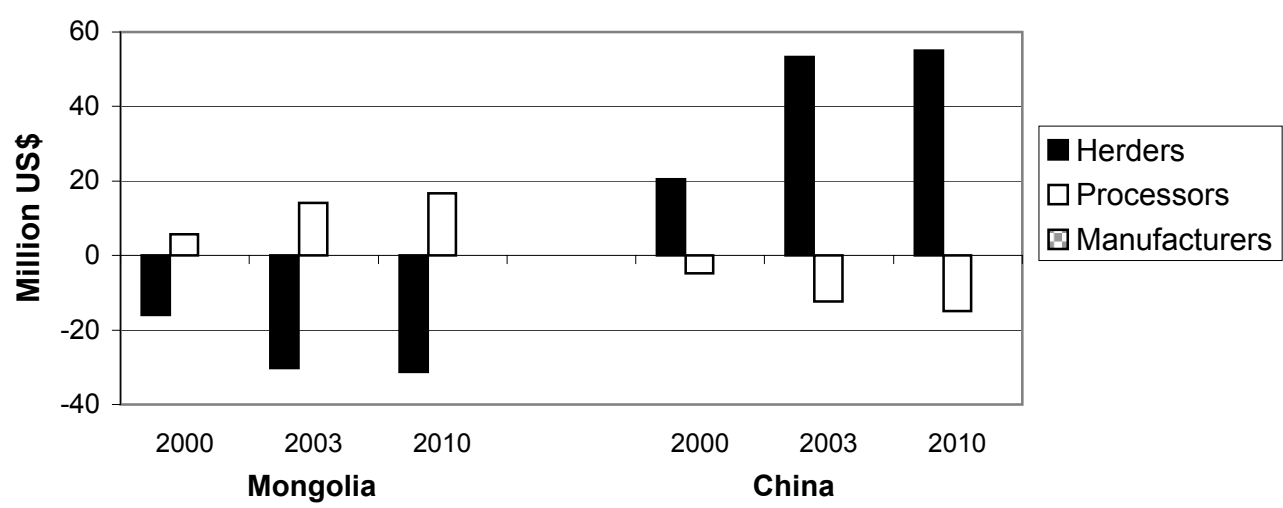
**Tax Revenues:**

Raw Cashmere	s M\$	16	15	16
	b M\$	22	23	24
Processed Cashmere	s M\$	2	3	4
	b M\$	1	2	3
Manufac. Cashmere Prod.	s M\$	4	5	6
	b M\$	4	5	6
Total Tax Revenue	s M\$	22	22	27
	b M\$	27	29	33

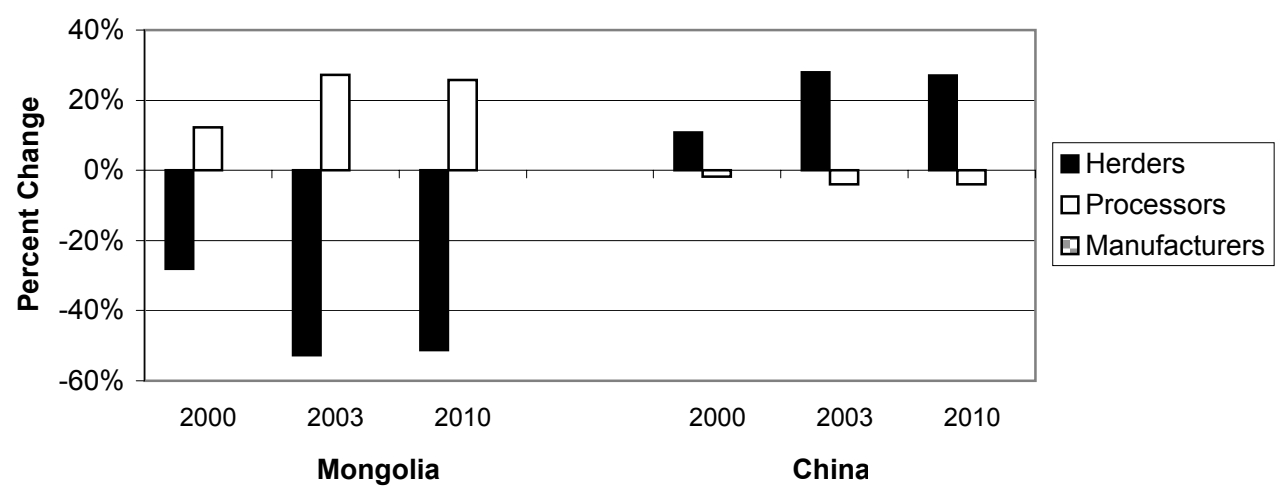
Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the 'Raw' sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable.

Model scenario-> **bane** File = CASHbane.sol

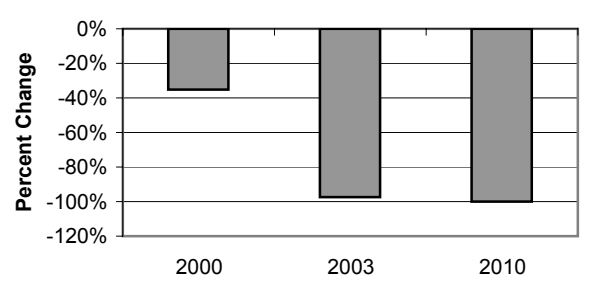
**Change in Income From an Export Ban of Raw Cashmere**



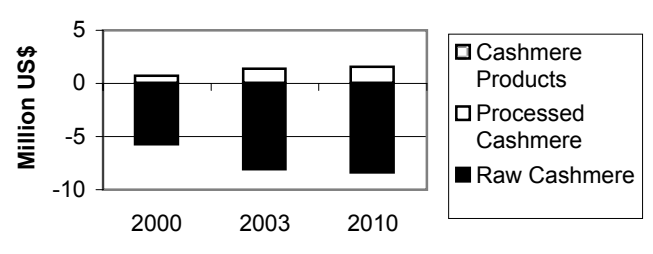
**Change in Incomes From an Export Ban of Raw Cashmere**



**Change in Raw Cashmere Exports**



**Change in Tax Revenue From Cashmere Sector**



**Table 2 - The Impact of the Full Collection of the Mongolian Export Tax on Raw Cashmere**

Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World								
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long						
Income of Herders	M\$	-2	-7	-10	2	8	11	0	1	2						
	%	-3%	-12%	-16%	1%	4%	5%	1%	4%	5%						
Processed Cashmere Sales	M\$	0	2	4	0	-2	-3	0	0	0						
	%	1%	4%	6%	0%	-1%	-1%	0%	-1%	-1%						
Manufactured Product Sales	M\$	0	0	0	0	0	0	0	0	0						
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%						
Quantity Raw Cashmere Prod.	t	-5	-41	-70	5	39	67	1	6	10						
	%	0%	-1%	-2%	0%	0%	1%	0%	0%	1%						
Quantity Proc. Cashmere	t	10	43	58	-8	-38	-51	-1	-6	-7						
	%	1%	4%	6%	0%	-1%	-1%	0%	-1%	-1%						
Quantity Cash. Manuf. Goods	t	0	0	0	0	0	0	0	0	0						
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%						
Raw Cashmere Price	\$/kg	-1	-2	-3	0	1	1	0	1	1						
	%	-3%	-11%	-14%	1%	4%	5%	1%	4%	5%						
Processed Cashmere Price	\$/kg	0	0	0	0	0	0	0	0	0						
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%						
Average Manuf. Good Price	\$/kg	0	0	0	0	0	0	0	0	0						
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%						
Export Value of Raw Cashmere	M\$	-1	-5	-7	<p align="center"><b>Comments About This Scenario</b></p> <p>FULL ENFORCEMENT OF THE 30% EXPORT TAX ON RAW CASHMERE - Herder income declines about 16% leading to about a 2% reduction in production in the long-term. Raw cashmere exports ultimately decline by 248 tons and 33% in value. This is accompanied by 8% increase in processed cashmere export value and volume. Chinese herder income rises 5% and Mongolian processor income rises 6%.</p> <p>An extra 1 million US\$ in tax revenue is collected which amounts to a 4% increase in tax revenue from the cashmere sectors.</p> <p>The CASH model assumptions of markets ultimately moved by world prices, means that policies the raise or lower the price of raw Mongolian cashmere, impact herders' incomes in Mongolia and China, and processors' incomes in the two countries.</p>											
	%	-6%	-24%	-33%												
Export Value of Proc. Cashmere	M\$	0	2	4												
	%	1%	6%	8%												
Export Value of Manuf. Goods	M\$	0	0	0												
	%	0%	0%	0%												
Export Quant. of Raw Cashmere	t	-34	-171	-248												
	%	-3%	-15%	-22%												
Export Quant. of Proc. Cashmere	t	10	43	58												
	%	1%	6%	8%												
Export Quant. of Manuf. Goods	t	0	0	0												
	%	0%	0%	0%												
Tax Revenue:																
Raw Cashmere	M\$	0	1	1												
Proc. Cashmere	M\$	0	0	0												
Cashmere Prod.	M\$	0	0	0												
Total Tax Revenue	M\$	0	1	1												
	%	2%	4%	4%												

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.



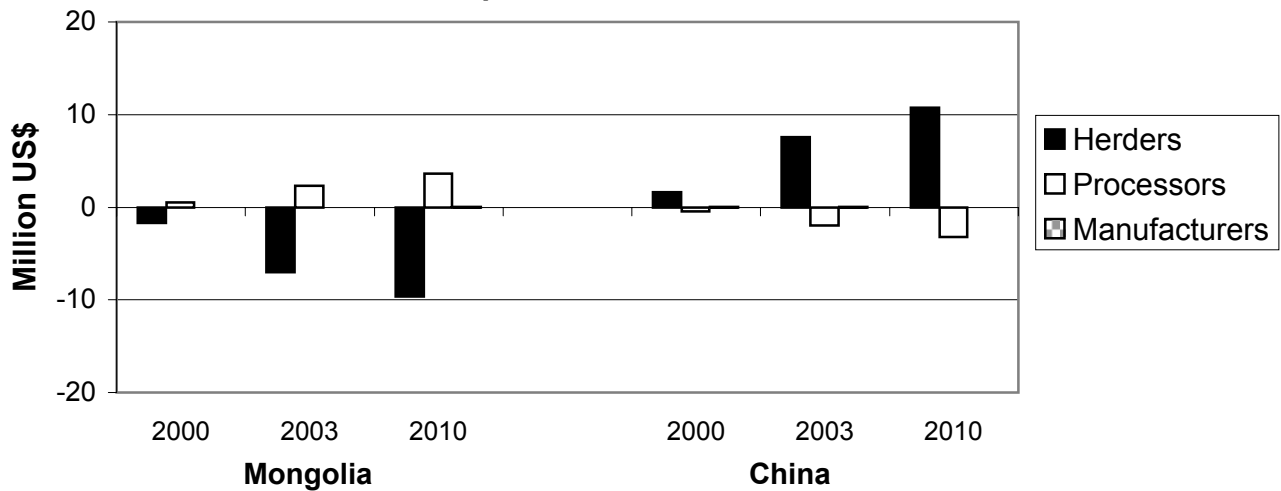
**Table 2 - The Impact of the Full Collection of the Mongolian Export Tax on Raw Cashmere continued**

Scenario (s), base (b) model numbers	Mongolia			China			Rest of World			
	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	
Income of Herders	s M\$	55	50	51	191	198	214	28	29	31
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	47	54	69	281	304	367	36	39	47
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	26	32	48	335	383	509	506	582	780
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2989	3023	3111	9965	10231	10644	1445	1484	1543
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	938	1007	1092	5576	5653	5839	706	717	746
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	220	240	285	2807	2879	3030	4240	4370	4645
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	18	17	17	19	19	20	19	19	20
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	50	54	63	50	54	63	50	54	63
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	119	133	168	119	133	168	119	133	168
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	21	16	15	-22	-19	-18	144	790	1112
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	36	42	52	140	151	182	-177	-193	-235
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	22	27	41	267	303	396	-289	-330	-437
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	1121	979	892	-1125	-999	-920	4	20	28
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	722	777	834	2785	2812	2905	-3507	-3589	-3739
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	180	200	245	2238	2275	2358	-2419	-2475	-2603
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603
<b>Tax Revenues:</b>										
Raw Cashmere	s M\$	23	24	25	Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the 'Raw' sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable.					
	b M\$	22	23	24						
Processed Cashmere	s M\$	1	2	3						
	b M\$	1	2	3						
Manufac. Cashmere Prod.	s M\$	4	5	6						
	b M\$	4	5	6						
Total Tax Revenue	s M\$	28	30	35						
	b M\$	27	29	33						

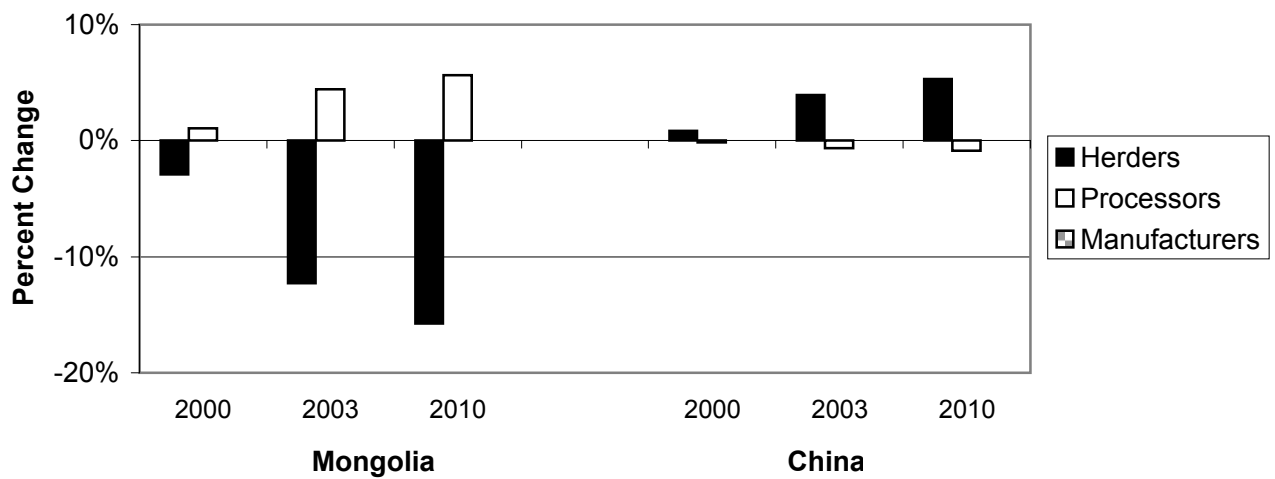
Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the 'Raw' sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable.

Model scenario-> **ctax** File = CASHctax.sol

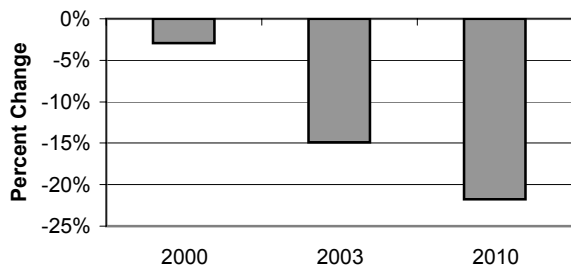
**Change in Income From the Full Collection of the Export Tax on Raw Cashmere**



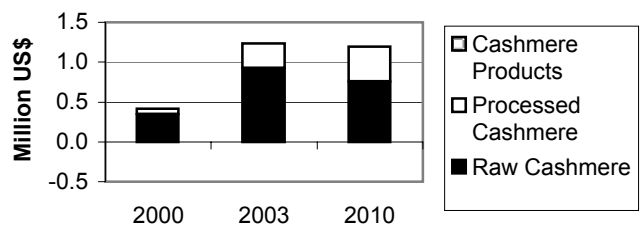
**Change in Income From the Full Collection of the Export Tax on Raw Cashmere**



**Change in Raw Cashmere Exports**



**Change in Tax Revenue From Cashmere Sector**



**Table 3 - The Impact of a Full Removal of the Mongolian Export Tax on Raw Cashmere**

Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World										
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long								
Income of Herders	M\$	1	5	10	-1	-4	-8	0	-1	-1								
	%	2%	9%	16%	-1%	-2%	-4%	-1%	-2%	-4%								
Processed Cashmere Sales	M\$	0	-1	-3	0	1	3	0	0	0								
	%	-1%	-3%	-5%	0%	0%	1%	0%	0%	1%								
Manufactured Product Sales	M\$	0	0	0	0	0	0	0	0	0								
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%								
Quantity Raw Cashmere Prod.	t	3	27	61	-3	-24	-54	0	-3	-8								
	%	0%	1%	2%	0%	0%	-1%	0%	0%	-1%								
Quantity Proc. Cashmere	t	-7	-26	-47	6	23	41	1	3	6								
	%	-1%	-3%	-5%	0%	0%	1%	0%	0%	1%								
Quantity Cash. Manuf. Goods	t	0	0	0	0	0	0	0	0	0								
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%								
Raw Cashmere Price	\$/kg	0	1	3	0	0	-1	0	0	-1								
	%	2%	8%	13%	-1%	-2%	-4%	-1%	-2%	-4%								
Processed Cashmere Price	\$/kg	0	0	0	0	0	0	0	0	0								
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%								
Average Manuf. Good Price	\$/kg	0	0	0	0	0	0	0	0	0								
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%								
Export Value of Raw Cashmere	M\$	1	4	7	<p style="text-align: center;"><b>Comments About This Scenario</b></p> <p>EXPORT TAX REMOVAL - This scenario assumes that the export tax is gradually removed by 2003. Herder income rises about 16% while processor income falls about 5%. Export values of Mongolian cashmere rise about 33% while export values of processed cashmere fall about 6%. In China, the opposite effect occurs. Incomes of Chinese herders decrease by 4%. Mongolia produces 2% more cashmere while China produces about 1% less.</p> <p>The effects of an export tax removal are the opposite of the full collection of the tax in Table 2. Again, impacts are mostly, but not completely distributed between herders and processors in Mongolia and China.</p> <p>The removal ultimately reduces tax revenue from the sector by 7% or 2 million US\$.</p>													
	%	4%	17%	33%														
Export Value of Proc. Cashmere	M\$	0	-1	-3														
	%	-1%	-4%	-6%														
Export Value of Manuf. Goods	M\$	0	0	0														
	%	0%	0%	0%														
Export Quant. of Raw Cashmere	t	23	104	200														
	%	2%	9%	18%														
Export Quant. of Proc. Cashmere	t	-7	-26	-47														
	%	-1%	-4%	-6%														
Export Quant. of Manuf. Goods	t	0	0	0														
	%	0%	0%	0%														
Tax Revenue:																		
Raw Cashmere	M\$	0	-1	-2														
Proc. Cashmere	M\$	0	0	0														
Cashmere Prod.	M\$	0	0	0														
Total Tax Revenue	M\$	0	-1	-2														
	%	-1%	-4%	-7%														

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.

**Table 3 - The Impact of a Full Removal of the Mongolian Export Tax on Raw Cashmere continued**

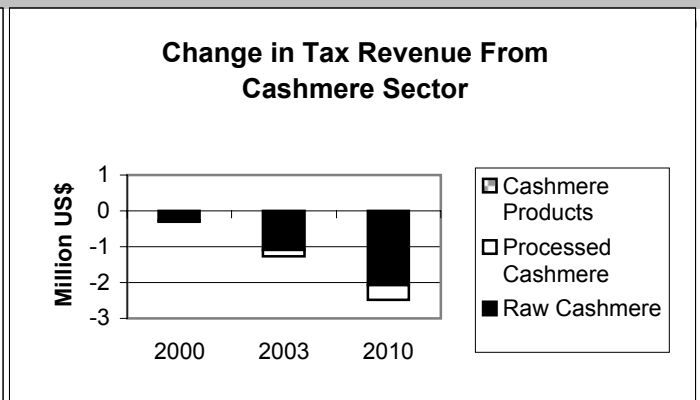
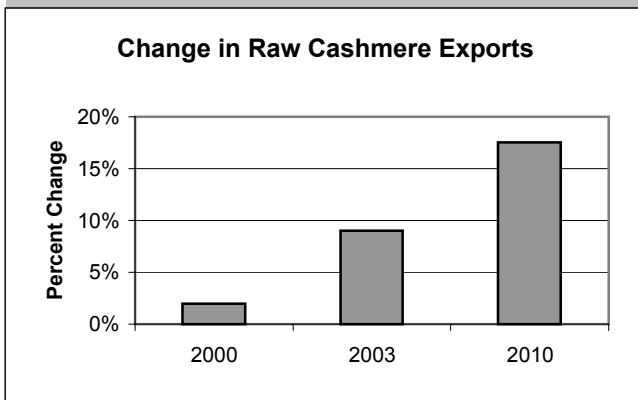
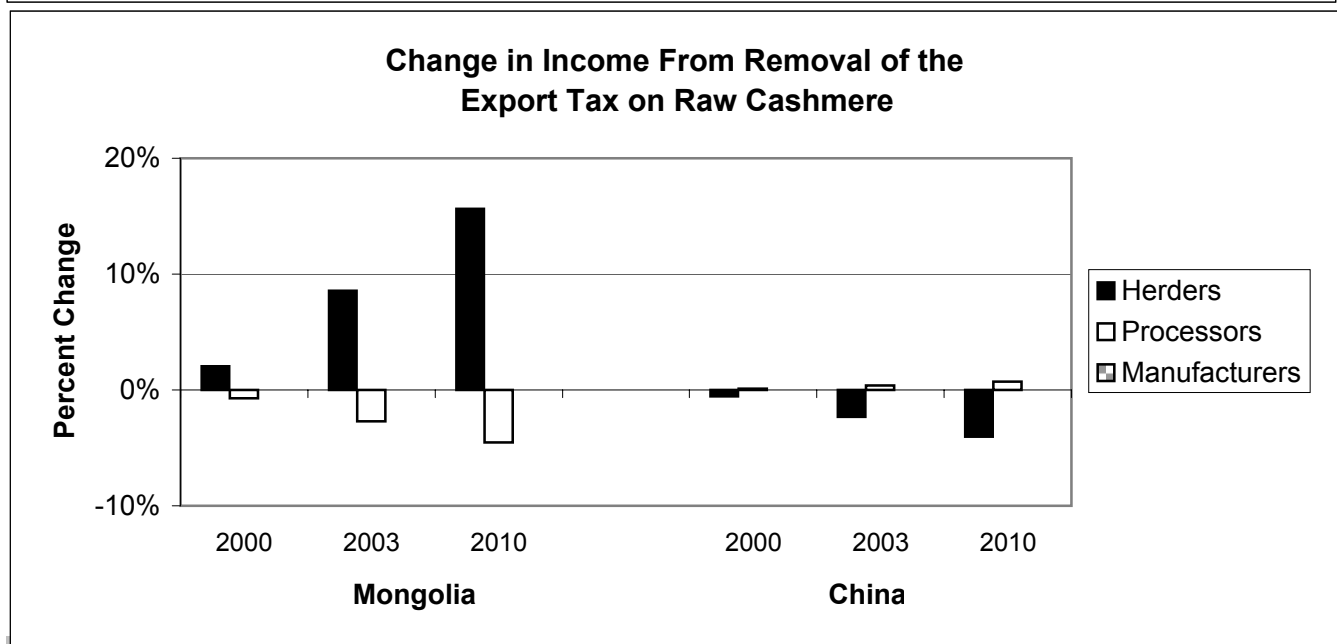
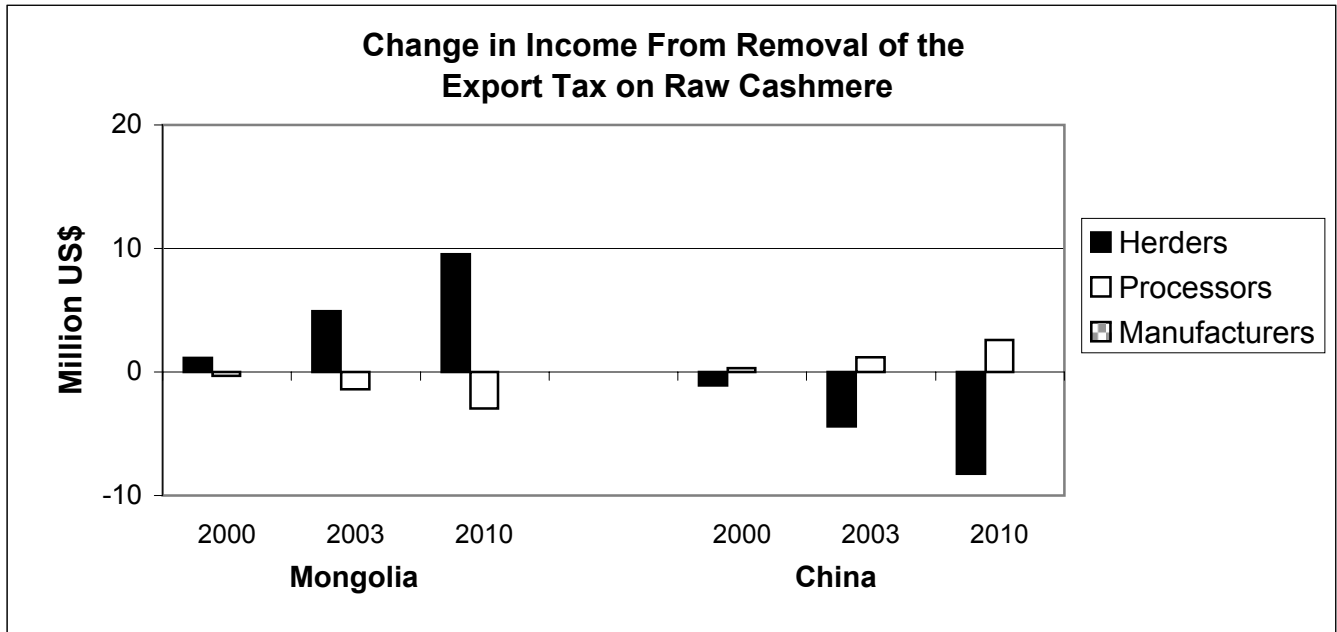
Scenario (s), base (b) model numbers	Mongolia			China			Rest of World			
	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	
Income of Herders	s M\$	58	62	71	188	187	195	27	27	28
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	46	50	62	282	307	373	36	39	48
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	26	32	48	335	383	509	506	582	780
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2997	3091	3242	9957	10169	10524	1444	1474	1526
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	922	938	986	5591	5713	5931	708	726	760
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	220	240	285	2807	2880	3030	4240	4370	4645
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	19	20	22	19	18	19	19	18	19
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	50	54	63	50	54	63	50	54	63
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	119	133	168	119	133	168	119	133	168
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	23	25	29	-22	-23	-24	-143	-585	-1167
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	36	38	46	141	154	188	-177	-192	-234
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	22	27	41	267	303	396	-289	-330	-437
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	1178	1254	1340	-1174	-1238	-1308	-4	-16	-31
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	706	708	728	2799	2872	2997	-3505	-3580	-3725
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	180	200	245	2238	2275	2358	-2419	-2475	-2603
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603

**Tax Revenues:**

Raw Cashmere	s M\$	22	22	22
	b M\$	22	23	24
Processed Cashmere	s M\$	1	1	2
	b M\$	1	2	3
Manufac. Cashmere Prod.	s M\$	4	5	6
	b M\$	4	5	6
Total Tax Revenue	s M\$	27	27	31
	b M\$	27	29	33

Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the "Raw" sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable.

Model scenario-> **etax** File = CASHetax.sol



**Table 4 - The Impact of Increased World Economic Growth and Cashmere Demand**

Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World									
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long							
Income of Herders	M\$	1	5	8	5	17	26	1	2	4							
	%	3%	9%	13%	3%	9%	13%	3%	9%	13%							
Processed Cashmere Sales	M\$	2	8	15	10	42	78	1	5	10							
	%	4%	15%	24%	4%	14%	21%	4%	14%	22%							
Manufactured Product Sales	M\$	2	8	19	14	67	139	23	105	221							
	%	6%	25%	40%	4%	17%	27%	4%	18%	28%							
Quantity Raw Cashmere Prod.	t	4	28	49	14	87	153	2	13	22							
	%	0%	1%	2%	0%	1%	1%	0%	1%	1%							
Quantity Proc. Cashmere	t	7	29	48	19	81	131	3	13	21							
	%	1%	3%	5%	0%	1%	2%	0%	2%	3%							
Quantity Cash. Manuf. Goods	t	5	23	42	19	77	124	35	142	231							
	%	2%	9%	15%	1%	3%	4%	1%	3%	5%							
Raw Cashmere Price	\$/kg	0	1	2	0	1	2	0	1	2							
	%	2%	8%	11%	2%	8%	11%	2%	8%	11%							
Processed Cashmere Price	\$/kg	2	6	12	2	6	12	2	6	12							
	%	3%	12%	18%	3%	12%	18%	3%	12%	18%							
Average Manuf. Good Price	\$/kg	4	19	37	4	19	37	4	19	37							
	%	4%	14%	22%	4%	14%	22%	4%	14%	22%							
Export Value of Raw Cashmere	M\$	1	2	2	<p align="center"><b>Comments About This Scenario</b></p> <p>WORLD GROWTH INCREASE AND INCREASED DEMAND FOR CASHMERE GOODS - World growth rates are increased about 1% for this scenario and an additional 1% annual growth in the demand for cashmere goods was assumed due to business cycle factors, fashion changes, good marketing programs, etc. The demand increase in the rest of the world was assumed to be up to 10% in the first decade. This scenario increases income for Mongolian herders, processors, and clothing manufacturers 13%, 24%, and 40% in the long run. China showed smaller percentage increases due to the CASH model's assumption that smaller producers can be more responsive to changing markets. Price increases were largest for manufacturers (22%), less for processors (18%), and lowest for herders (11%). Every sector's income rose, government tax revenue rose (18%), as did export values (more than export volumes). This is a classic example of a demand-led boom which feeds through to all stages of processing and all sectors</p>												
	%	2%	8%	11%													
Export Value of Proc. Cashmere	M\$	1	6	11													
	%	4%	15%	23%													
Export Value of Manuf. Goods	M\$	1	7	18													
	%	7%	28%	44%													
Export Quant. of Raw Cashmere	t	0	-1	-3													
	%	0%	0%	0%													
Export Quant. of Proc. Cashmere	t	4	17	28													
	%	1%	2%	4%													
Export Quant. of Manuf. Goods	t	6	24	43													
	%	3%	12%	18%													
Tax Revenue:																	
Raw Cashmere	M\$	1	2	3								<p>gain</p>					
Proc. Cashmere	M\$	0	0	1													
Cashmere Prod.	M\$	0	1	2													
Total Tax Revenue	M\$	1	3	6													
	%	3%	11%	18%													

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.

**Table 4 - The Impact of Increased World Economic Growth and Cashmere Demand**

**continued**

<u>Scenario (s), base (b)</u> <u>model numbers</u>	<b>Mongolia</b>			<b>China</b>			<b>Rest of World</b>			
	<u>Short</u>	<u>Medium</u>	<u>Long</u>	<u>Short</u>	<u>Medium</u>	<u>Long</u>	<u>Short</u>	<u>Medium</u>	<u>Long</u>	
Income of Herders	s M\$	58	62	69	194	207	229	28	30	33
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	49	60	80	292	347	447	37	44	58
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	28	40	67	349	450	648	528	687	1002
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2998	3092	3230	9975	10280	10731	1446	1491	1556
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	935	993	1081	5604	5772	6021	710	736	774
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	226	263	327	2827	2957	3154	4275	4512	4876
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	19	20	21	19	20	21	19	20	21
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	52	60	74	52	60	74	52	60	74
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	124	152	205	124	152	205	124	152	205
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	22	23	24	-22	-23	-24	-40	-146	-309
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	37	45	60	146	174	225	-183	-219	-285
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	23	34	59	279	360	510	-302	-394	-569
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	1155	1150	1137	-1154	-1146	-1130	-1	-4	-7
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	716	751	804	2804	2894	3028	-3521	-3646	-3832
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	186	224	288	2260	2363	2483	-2446	-2587	-2771
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603

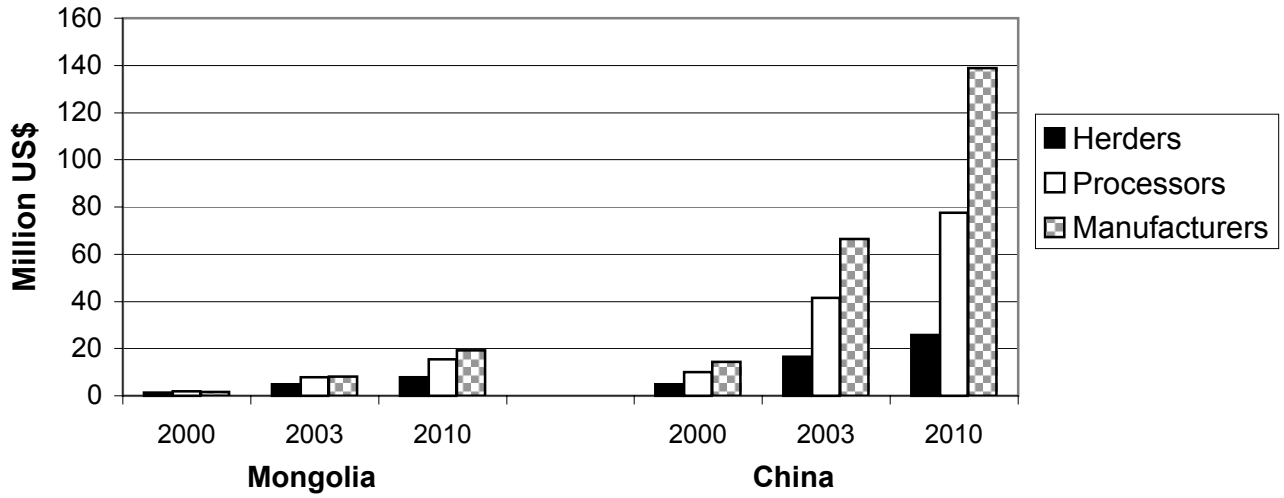
**Tax Revenues:**

Raw Cashmere	s M\$	23	25	28
	b M\$	22	23	24
Processed Cashmere	s M\$	1	2	4
	b M\$	1	2	3
Manufac. Cashmere Prod.	s M\$	4	5	8
	b M\$	4	5	6
Total Tax Revenue	s M\$	28	32	39
	b M\$	27	29	33

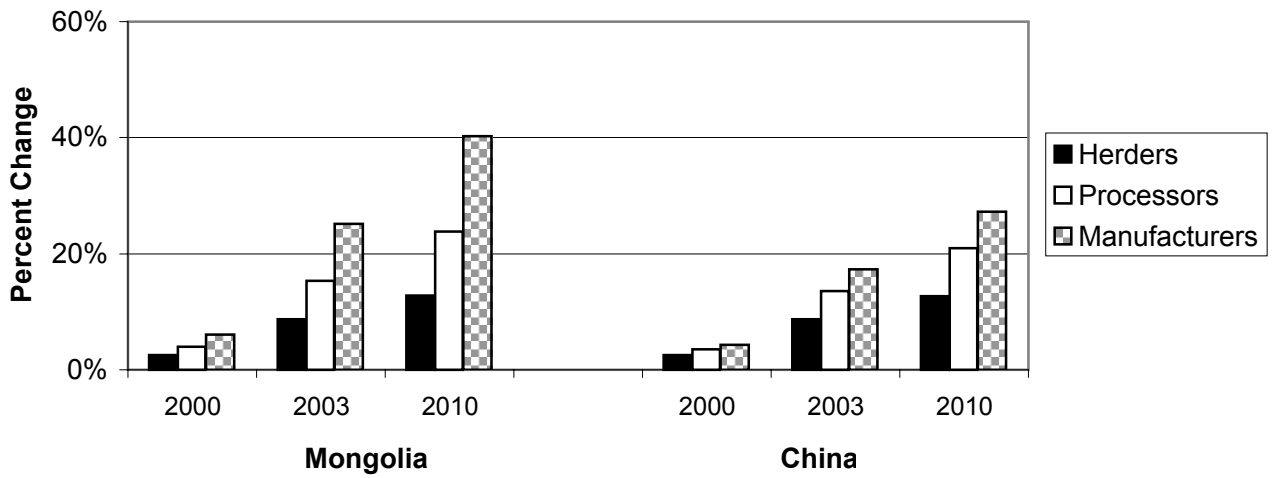
Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the "Raw" sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and direction of change are reasonable.

Model scenario-> **wgro** File = CASHwgro.sol

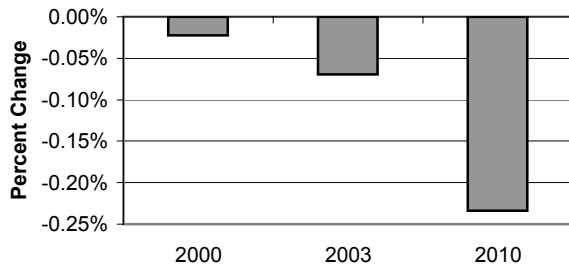
**Change in Income from Increased World Economic Growth and Cashmere Demand**



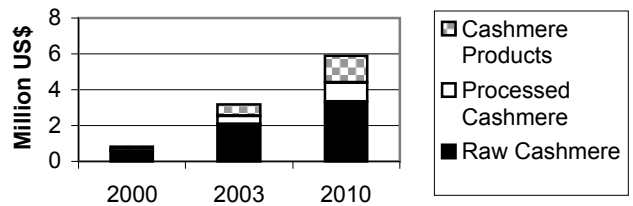
**Change in Income from Increased World Economic Growth and Cashmere Demand**



**Change in Raw Cashmere Exports**



**Change in Tax Revenue From Cashmere Sector**





**Table 5 - The Impact of a 20% Chinese Currency Devaluation on the Cashmere Sector**

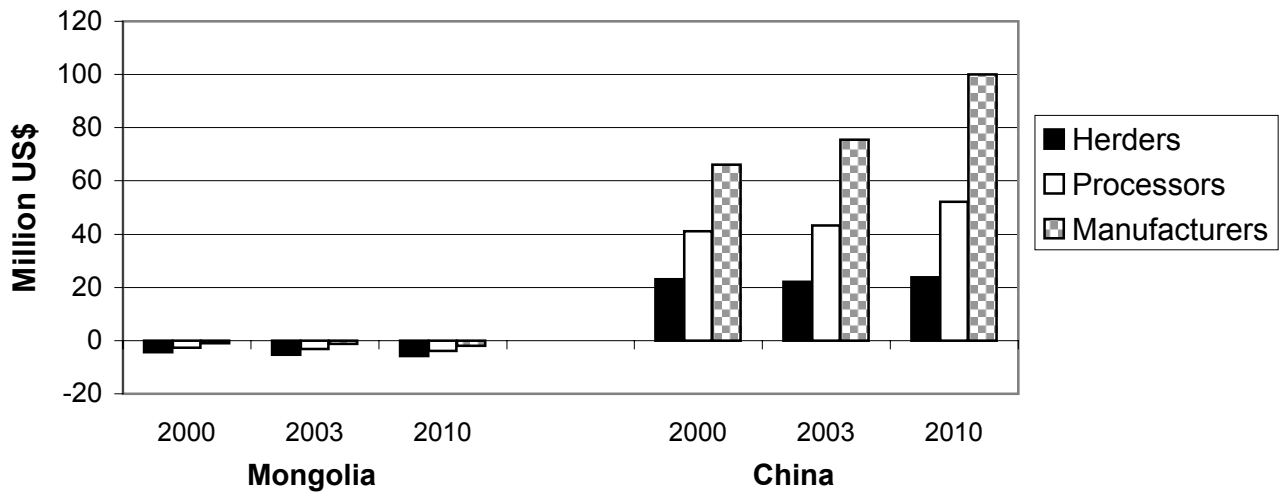
Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World		
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Income of Herders	M\$	-4	-5	-6	23	22	24	-2	-3	-3
	%	-8%	-9%	-9%	12%	12%	12%	-8%	-9%	-9%
Processed Cashmere Sales	M\$	-3	-3	-4	41	43	52	-2	-2	-3
	%	-6%	-6%	-6%	15%	14%	14%	-6%	-6%	-6%
Manufactured Product Sales	M\$	-1	-1	-2	66	75	100	-18	-21	-28
	%	-4%	-4%	-4%	20%	20%	20%	-4%	-4%	-4%
Quantity Raw Cashmere Prod.	t	-13	-39	-41	65	139	144	-6	-18	-18
	%	0%	-1%	-1%	1%	1%	1%	0%	-1%	-1%
Quantity Proc. Cashmere	t	-1	1	1	61	67	69	-1	0	0
	%	0%	0%	0%	1%	1%	1%	0%	0%	0%
Quantity Cash. Manuf. Goods	t	-2	-2	-3	85	89	93	-16	-15	-17
	%	-1%	-1%	-1%	3%	3%	3%	0%	0%	0%
Raw Cashmere Price	\$/kg	-1	-2	-2	2	2	2	-1	-2	-2
	%	-7%	-8%	-8%	11%	10%	10%	-7%	-8%	-8%
Processed Cashmere Price	\$/kg	-3	-3	-4	7	7	8	-3	-3	-4
	%	-5%	-6%	-6%	13%	13%	13%	-5%	-6%	-6%
Average Manuf. Good Price	\$/kg	-4	-4	-5	19	21	27	-4	-4	-5
	%	-3%	-3%	-3%	16%	16%	16%	-3%	-3%	-3%
Export Value of Raw Cashmere	M\$	-2	-3	-3	<p align="center"><b>Comments About This Scenario</b></p> <p>10% CHINESE CURRENCY DEVALUATION - This scenario assumes China devalues its currency by 20% late in 1999 or early in 2000. Mongolian raw cashmere exports to China decline by 7% in the long-term. Chinese exports of processed cashmere and cashmere products become more competitive in the world market at the expense of processors and manufacturers in Mongolia and the Rest of the World. Mongolian herders' income declines 9% because of lower export values (-14%) and volumes (to China) (-7%) while Mongolian processors and cashmere clothing manufacturers lose 2-4% in sales due to increased competition from China in world markets. As expected, herders, processors, and manufacturers in the Rest of the World suffer as similar adverse impact.</p> <p>Mongolian government tax revenue is down 6% with most of decline coming from decreased export tax revenues.</p>					
%	-10%	-14%	-14%							
Export Value of Proc. Cashmere	M\$	-2	-2	-3						
%	-6%	-6%	-6%							
Export Value of Manuf. Goods	M\$	-1	-1	-2						
%	-5%	-5%	-5%							
Export Quant. of Raw Cashmere	t	-37	-72	-76						
%	-3%	-6%	-7%							
Export Quant. of Proc. Cashmere	t	-3	-2	-3						
%	0%	0%	0%							
Export Quant. of Manuf. Goods	t	-3	-3	-3						
%	-2%	-1%	-1%							
Tax Revenue:										
Raw Cashmere	M\$	-1	-2	-2						
Proc. Cashmere	M\$	0	0	0						
Cashmere Prod.	M\$	0	0	0						
Total Tax Revenue	M\$	-2	-2	-2						
	%	-6%	-6%	-6%						

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.

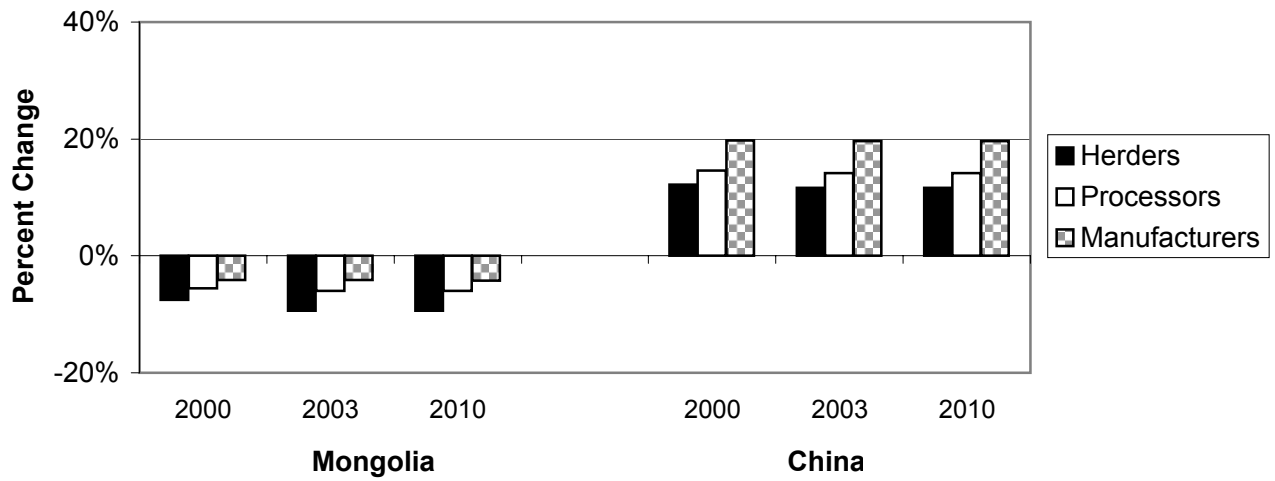
**Table 5 - The Impact of a 20% Chinese Currency Devaluation on the Cashmere Sector continued**

<u>Scenario (s), base (b)</u> <u>model numbers</u>	<u>Mongolia</u>			<u>China</u>			<u>Rest of World</u>			
	<u>Short</u>	<u>Medium</u>	<u>Long</u>	<u>Short</u>	<u>Medium</u>	<u>Long</u>	<u>Short</u>	<u>Medium</u>	<u>Long</u>	
Income of Herders	s M\$	53	52	55	213	213	227	25	25	27
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	44	49	61	323	349	422	34	36	44
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	25	31	46	401	459	609	488	561	752
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2980	3025	3140	10026	10332	10722	1438	1460	1515
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	928	965	1034	5645	5758	5960	706	723	754
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	218	238	283	2893	2968	3123	4223	4354	4628
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	18	17	18	21	21	21	18	17	18
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	48	50	59	57	61	71	48	50	59
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	116	129	163	139	155	195	116	129	163
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	20	19	19	-23	-22	-22	-628	-1184	-1353
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	34	37	46	161	174	211	-168	-182	-221
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	20	25	39	328	372	487	-294	-335	-445
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	1118	1078	1064	-1100	-1044	-1026	-18	-34	-38
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	709	732	773	2812	2871	2979	-3521	-3603	-3751
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	177	197	241	2365	2407	2500	-2542	-2604	-2741
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603
<b>Tax Revenues:</b>										
Raw Cashmere	s M\$	21	21	23	Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the 'Raw' sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable. Model scenario-> <b>devl</b> File = CASHdevl.sol					
	b M\$	22	23	24						
Processed Cashmere	s M\$	1	1	2						
	b M\$	1	2	3						
Manufac. Cashmere Prod.	s M\$	4	5	6						
	b M\$	4	5	6						
Total Tax Revenue	s M\$	26	27	31						
	b M\$	27	29	33						

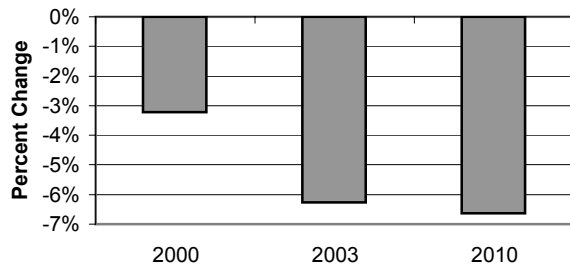
**Change in Income From a 20% Chinese Currency Devaluation**



**Change in Income From a 20% Chinese Currency Devaluation**



**Change in Raw Cashmere Exports**



**Change in Tax Revenue From Cashmere Sector**



**Table 6 - The Impact of a 10% Increase in Quality-Led Mongolian Export Prices**

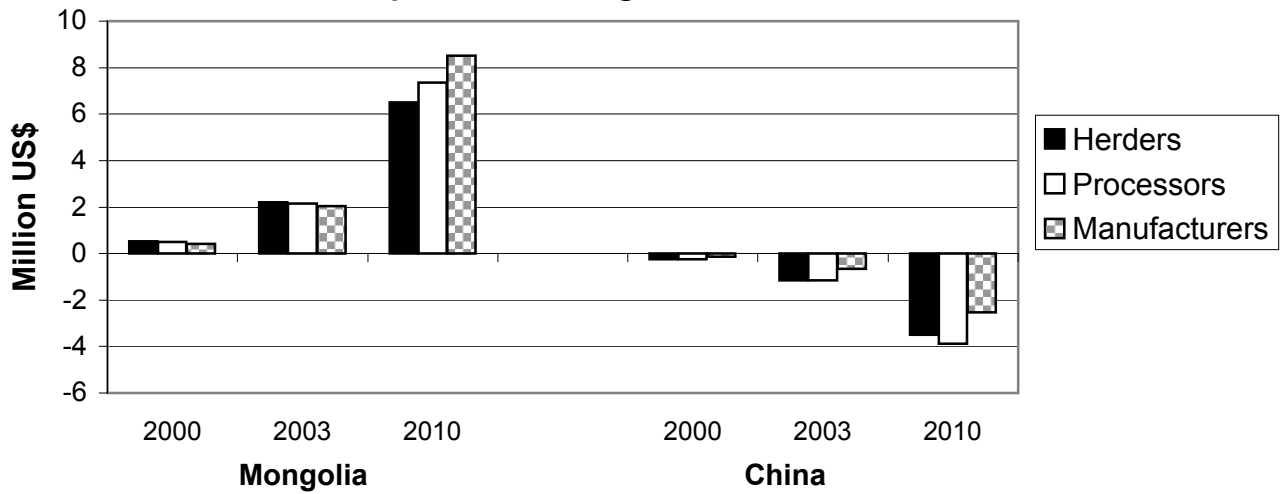
Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World									
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long							
Income of Herders	M\$	1	2	7	0	-1	-3	0	0	-1							
	%	1%	4%	11%	0%	-1%	-2%	0%	-1%	-2%							
Processed Cashmere Sales	M\$	0	2	7	0	-1	-4	0	0	-1							
	%	1%	4%	11%	0%	0%	-1%	0%	0%	-1%							
Manufactured Product Sales	M\$	0	2	9	0	-1	-3	0	-1	-4							
	%	2%	6%	18%	0%	0%	0%	0%	0%	-1%							
Quantity Raw Cashmere Prod.	t	2	12	40	-1	-6	-21	0	-1	-3							
	%	0%	0%	1%	0%	0%	0%	0%	0%	0%							
Quantity Proc. Cashmere	t	1	5	14	0	0	1	0	0	0							
	%	0%	1%	1%	0%	0%	0%	0%	0%	0%							
Quantity Cash. Manuf. Goods	t	1	6	19	0	0	0	0	0	-1							
	%	1%	2%	7%	0%	0%	0%	0%	0%	0%							
Raw Cashmere Price	\$/kg	0	1	2	0	0	0	0	0	0							
	%	1%	3%	9%	0%	-1%	-2%	0%	-1%	-2%							
Processed Cashmere Price	\$/kg	0	2	6	0	0	-1	0	0	-1							
	%	1%	4%	10%	0%	0%	-1%	0%	0%	-1%							
Average Manuf. Good Price	\$/kg	1	5	18	0	0	-1	0	0	-1							
	%	1%	4%	10%	0%	0%	0%	0%	0%	0%							
Export Value of Raw Cashmere	M\$	0	1	3	<p style="text-align: center;"><b>Comments About This Scenario</b></p> <p>MONGOLIAN CASHMERE QUALITY IMPROVEMENT - This scenario assumes a gradual (1% per year) improvement in the quality of Mongolian cashmere which, in turn, brings a 1% per year increase in the price of Mongolian cashmere (raw, processed, and manufactured products). This process takes place continually over 11 years. This process ultimately leads to a 11 or more percent increase in incomes in the Mongolian cashmere sector. The adverse effects are small on China and the Rest of the World who lose out to Mongolian competition at the higher end of the product scale. Exports of raw cashmere, processed cashmere, and cashmere clothing rise 14, 11, and 20% in volume and less in value. Government tax revenue increases by 9% from taxes on the cashmere sector. Here, all Mongolian cashmere sectors gain.</p> <p>This scenario is an interpretation of what might happen if cashmere quality is improved; the CASH model does not measure quality improvement per se, but its economic</p>												
	%	1%	5%	14%													
Export Value of Proc. Cashmere	M\$	0	2	5													
	%	1%	4%	11%													
Export Value of Manuf. Goods	M\$	0	2	8													
	%	2%	7%	20%													
Export Quant. of Raw Cashmere	t	2	15	46													
	%	0%	1%	4%													
Export Quant. of Proc. Cashmere	t	1	3	7													
	%	0%	0%	1%													
Export Quant. of Manuf. Goods	t	2	7	21													
	%	1%	3%	9%													
Tax Revenue:																	
Raw Cashmere	M\$	0	1	2													
Proc. Cashmere	M\$	0	0	0													
Cashmere Prod.	M\$	0	0	0													
Total Tax Revenue	M\$	0	1	3													
	%	1%	3%	9%													

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.

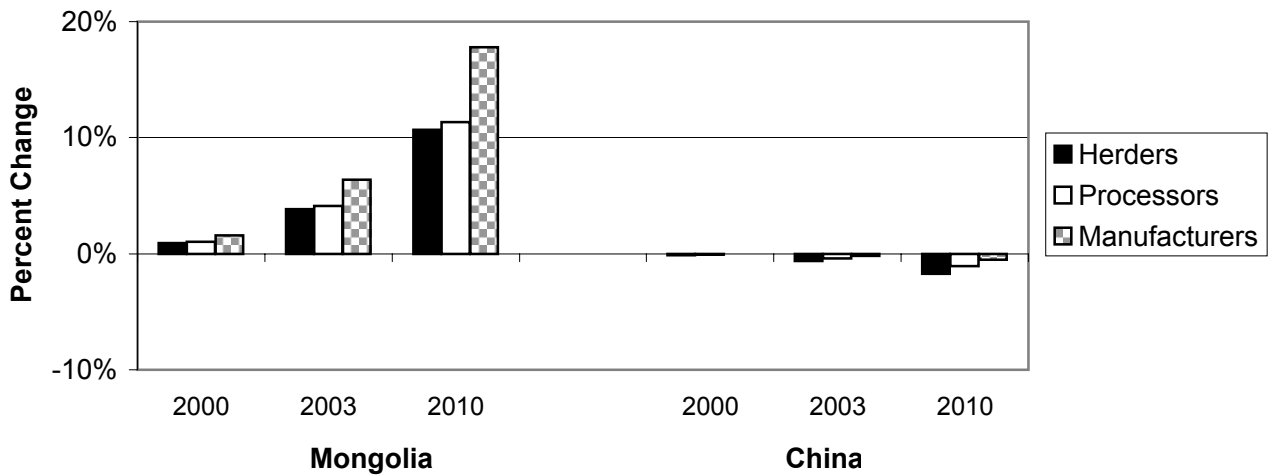
**Table 6 - The Impact of a 10% Increase in Quality-Led Mongolian Export Prices** continued

<u>Scenario (s), base (b)</u> <u>model numbers</u>		Mongolia			China			Rest of World		
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Income of Herders	s M\$	57	60	68	189	190	200	27	28	29
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	47	54	72	281	304	366	36	39	47
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	27	34	56	335	383	507	506	581	776
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2995	3076	3220	9960	10186	10556	1444	1477	1531
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	930	969	1048	5585	5691	5891	707	723	754
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	222	246	304	2807	2879	3030	4240	4369	4643
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	19	19	21	19	19	19	19	19	19
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	51	56	69	50	53	62	50	53	62
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	120	138	186	119	133	167	119	133	167
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	22	23	25	-22	-22	-22	-39	-153	-414
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	36	41	54	141	152	184	-177	-192	-232
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	22	29	49	267	302	394	-289	-330	-438
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	1157	1165	1185	-1156	-1161	-1175	-1	-4	-11
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	713	737	782	2793	2849	2954	-3507	-3585	-3737
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	182	206	265	2238	2274	2356	-2420	-2481	-2622
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603
<b>Tax Revenues:</b>										
Raw Cashmere	s M\$	22	23	26	Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the 'Raw' sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable. Model scenario-> <b>qual</b> File = CASHqual.sol					
	b M\$	22	23	24						
Processed Cashmere	s M\$	1	2	3						
	b M\$	1	2	3						
Manufac. Cashmere Prod.	s M\$	4	5	7						
	b M\$	4	5	6						
Total Tax Revenue	s M\$	27	30	36						
	b M\$	27	29	33						

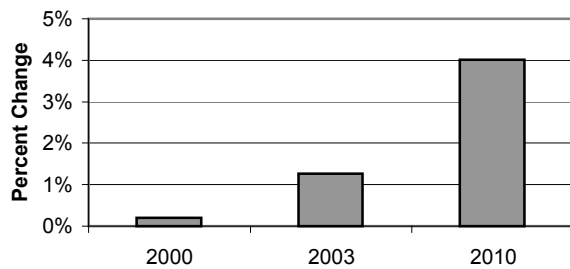
**Change in Income From a 10% Mongolian Quality Improvement Program for Cashmere**



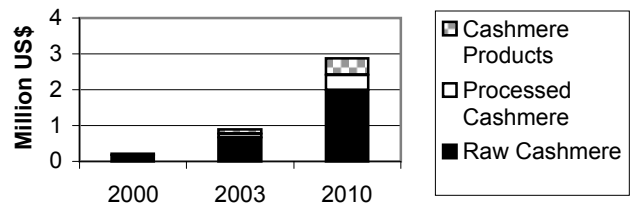
**Change in Income From a 10% Mongolian Quality Improvement Program for Cashmere**



**Change in Raw Cashmere Exports**



**Change in Tax Revenue From Cashmere Sector**



**Table 7 - The Impact of the Removal of a Hypothetical 10% Chinese Processor Subsidy**

Change (from a base) in the short, medium and long term:		Mongolia			China			Rest of World									
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long							
Income of Herders	M\$	0	-1	-1	-1	-2	-2	0	0	0							
	%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%							
Processed Cashmere Sales	M\$	1	4	4	-6	-17	-18	1	2	3							
	%	3%	7%	6%	-2%	-6%	-5%	2%	6%	5%							
Manufactured Product Sales	M\$	0	0	-1	1	3	4	-1	-2	-2							
	%	0%	-1%	-1%	0%	1%	1%	0%	0%	0%							
Quantity Raw Cashmere Prod.	t	-1	-4	-4	-3	-13	-14	0	-2	-2							
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%							
Quantity Proc. Cashmere	t	9	26	23	-20	-56	-51	4	12	10							
	%	1%	3%	2%	0%	-1%	-1%	1%	2%	1%							
Quantity Cash. Manuf. Goods	t	-1	-4	-4	7	19	17	-8	-22	-20							
	%	-1%	-1%	-1%	0%	1%	1%	0%	-1%	0%							
Raw Cashmere Price	\$/kg	0	0	0	0	0	0	0	0	0							
	%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%	-1%							
Processed Cashmere Price	\$/kg	1	2	2	-1	-3	-3	1	2	2							
	%	2%	5%	4%	-2%	-5%	-4%	2%	5%	4%							
Average Manuf. Good Price	\$/kg	0	0	0	0	0	0	0	0	0							
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%							
Export Value of Raw Cashmere	M\$	-1	-1	-1	<p align="center"><b>Comments About This Scenario</b></p> <p>REMOVE A HYPOTHETICAL 10% SUBSIDY TO CHINESE CASHMERE PROCESSORS - Not knowing whether or not Chinese processors are subsidized, one can assume that they are and remove the hypothetical subsidy in the CASH model. The impacts are as expected on China: Chinese processing sales decline 5%, raising world processed cashmere prices slightly. Mongolian raw cashmere exports to China decline by 5%, and herder's income drops 1%. Mongolian processors, on the other hand, increase their incomes by 6%. The assumed relative responsiveness of smaller Mongolian and Rest of the World processors in the CASH model means that they gain business as Chinese processors shrink when they lose the subsidy.</p> <p>Government tax revenues decline 1%.</p> <p>If the hypothetical subsidy was larger, the impacts would be larger of course.</p>												
	%	-2%	-6%	-6%													
Export Value of Proc. Cashmere	M\$	1	4	4													
	%	3%	9%	8%													
Export Value of Manuf. Goods	M\$	0	0	-1													
	%	-1%	-2%	-1%													
Export Quant. of Raw Cashmere	t	-22	-60	-54													
	%	-2%	-5%	-5%													
Export Quant. of Proc. Cashmere	t	12	33	30													
	%	2%	5%	4%													
Export Quant. of Manuf. Goods	t	-1	-4	-4													
	%	-1%	-2%	-1%													
Tax Revenue:																	
Raw Cashmere	M\$	0	0	0								<p>Government tax revenues decline 1%.</p> <p>If the hypothetical subsidy was larger, the impacts would be larger of course.</p>					
Proc. Cashmere	M\$	0	0	0													
Cashmere Prod.	M\$	0	0	0													
Total Tax Revenue	M\$	0	0	0													
	%	0%	1%	1%													

Source: Calculated from simulations of the CASH world cashmere market model (base = 1999). Short-term = 1 year (2000), medium-term = 4 years (2003), long-term = 11 years (2010). Tax revenues include the export tax, the procurement tax paid by processors, and the value added tax paid by processors and manufacturers.

**Table 7 - The Impact of the Removal of a Hypothetical 10% Chinese Processor Subsidy continued**

<u>Scenario (s), base (b)</u> <u>model numbers</u>		Mongolia			China			Rest of World		
		Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
Income of Herders	s M\$	57	57	60	188	188	201	27	27	29
	b M\$	57	57	61	189	191	203	27	28	29
Processed Cashmere Sales	s M\$	48	56	69	275	288	352	36	41	50
	b M\$	47	52	65	281	306	370	36	39	47
Manufactured Product Sales	s M\$	26	32	47	336	387	513	505	580	778
	b M\$	26	32	48	335	383	509	506	582	780
Quantity Raw Cashmere Prod.	s t	2993	3060	3177	9957	10179	10564	1444	1476	1532
	b t	2994	3064	3181	9960	10192	10577	1444	1478	1534
Quantity Proc. Cashmere	s t	938	990	1057	5565	5634	5839	711	734	764
	b t	929	964	1033	5585	5691	5890	707	723	753
Quantity Cash. Manuf. Goods	s t	219	237	282	2814	2898	3047	4232	4347	4624
	b t	220	240	285	2807	2880	3030	4240	4370	4645
Raw Cashmere Price - Herders	s \$/kg	19	19	19	19	19	19	19	19	19
	b \$/kg	19	19	19	19	19	19	19	19	19
Processed Cashmere Price	s \$/kg	51	56	65	49	51	60	51	56	65
	b \$/kg	50	54	63	50	54	63	50	54	63
Average Manuf. Good Price	s \$/kg	119	133	168	119	133	168	119	133	168
	b \$/kg	119	133	168	119	133	168	119	133	168
Export Value of Raw Cashmere	s M\$	21	20	21	-21	-20	-20	-411	-1108	-1119
	b M\$	22	22	22	-22	-22	-22	-28	-84	-194
Export Value of Proc. Cashmere	s M\$	37	43	53	141	155	188	-178	-198	-240
	b M\$	36	39	49	141	153	186	-177	-192	-234
Export Value of Manuf. Goods	s M\$	21	26	41	268	306	400	-289	-332	-440
	b M\$	22	27	41	267	303	396	-289	-330	-437
Export Quant. of Raw Cashmere	s t	1134	1090	1086	-1123	-1061	-1056	-11	-30	-29
	b t	1155	1150	1140	-1154	-1148	-1135	-1	-2	-5
Export Quant. of Proc. Cashmere	s t	724	767	806	2761	2758	2874	-3485	-3525	-3680
	b t	712	734	775	2794	2850	2956	-3506	-3584	-3732
Export Quant. of Manuf. Goods	s t	179	196	241	2245	2294	2376	-2424	-2490	-2617
	b t	180	200	245	2238	2275	2358	-2419	-2475	-2603
<b>Tax Revenues:</b>										
Raw Cashmere	s M\$	22	23	25	Negative "export" quantities or values mean the country/region is a net importer in the CASH model. Tax revenues in the 'Raw' sector include the 30% export and 3% procurement tax; in other sectors it is the 13% value added tax. Be cautioned that calculations are only approximate and are rough estimates of changes in quantities, prices, and values. Hopefully, orders and magnitude and direction of change are reasonable.					
	b M\$	22	23	24						
Processed Cashmere	s M\$	1	2	3						
	b M\$	1	2	3						
Manufac. Cashmere Prod.	s M\$	4	5	6						
	b M\$	4	5	6						
Total Tax Revenue	s M\$	27	29	34						
	b M\$	27	29	33						

Model scenario-> **csub** File = CASHcsub.sol



