



**Zhang Li Chuan**  
Director of  
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Department

## World trade efficiency

China Customs uses SAS® to retrieve duty losses, guide local customs authorities and control smuggling.

### Industry

Government

### Business Issue

To modernise duty collection, price evaluation, trade processing and customs logistics.

### Solution

The SAS intelligence architecture provides convenient, interactive analysis and enhanced supervision and monitoring of all customs administrative affairs.

### Benefits

Convenient, interactive analysis and enhanced supervision and monitoring of all customs administrative affairs.

How does a country keep track of all the goods crossing its borders? What is the best way to achieve tax harmony? Avoid smuggling? Heavyweight international trader China looks to its statistics department, and SAS, to achieve all this. China Customs' SAS-based Enforcement Assessment System (EAS) has now been live for more than two years, and the results are undeniably impressive.

Zhang Li Chuan, Director of the Statistics Department of Customs General Administration of China, states, "Before we had the SAS-based EAS, we had problems with our separate data sources. There was much hidden information, and we had to rely on empirical judgment. After using the system for just two years, hidden administrative risks have been detected, duty retrieved in 2002 was US\$20 million (€17 million) and we have distributed the system to 37 regional customs districts. We also have an advanced new system in progress. This is the largest application based on SAS in China's governmental organisations, and symbolises the fifth and ultimate phase of China Customs' modernisation project."

#### Big Country, Masses of Data

In 2002, China ranked fifth in the world in external trade status. All customs offices in China are organised in a three-level hierarchy. The top level is the Customs General Administration, which is directly subordinate to the State Council. The second level consists of 41 regional customs districts. The third

and lowest level has more than 300 branches. Statistical analysis has been playing an increasingly important role in decision support for national policy makers. As a new field of the statistics department, enforcement assessing was proposed as a method of internal statistical supervision.

China Customs has four basic tasks: supervising cargo, collecting duty, cracking down on smuggling and compiling statistics. "We realised we must exercise law-based administration, make things easy for traders and operate in a highly efficient manner," says Zhang. "Our statistics are official external merchandise trade statistics. China Customs is responsible for trade data collection, processing, compilation and publication. Our figures must be comprehensive, reliable and internationally comparable."

Since the 1990s, China Customs has made a great effort to establish a modern customs system by introducing the concept of risk management. As the country's external trade value increased very rapidly, China Customs faced ever-greater administrative risks. "To ensure effective supervision and efficiency, China Customs strives for innovation in management and a high level of administration," says Zhang. In 1998, severe circumstances in anti-smuggling fields drew attention from top leaders in China Customs. The head of the Statistics department made plans to establish the EAS.

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“The purpose of the EAS is to have an objective reflection of the procedures and results of customs enforcement, that is to say, to have an assessment of the quality of administration and management,” says Zhang. “The environment of China’s general external economy has been greatly transformed since the change in policy nearly 20 years ago. A rapid rise in our external trade value has meant a huge increase in data in recent years. Our observation of clearance has up to 50 million entries and the data load is 12 gigabytes, up from only two gigabytes five years ago.”

### **It’s ‘EASy’**

The EAS is composed of the following functional parts: the duty collection evaluation, price evaluation, trade processing evaluation and customs logistics evaluation.

“For a long time, statistics only meant giving facts,” continues Zhang. “A breakthrough idea for us was that customs data recorded not only procedures of external trade, but also procedures and results of customs management. This makes it possible for us to assess administrative performance by analysing our data.”

This idea has taken root in the organisation, and Zhang confirms that it has proven fruitful. “The EAS has been established for nearly three years and we have noticed a positive effect. First, the supervision mechanism has allowed

an improvement in the standard of enforcement. Second, through system refinement and data analysis, the accuracy of the system has increased from 28 to about 43 percent. Further, more than 4,200 cases of illegal actions have been detected by the system and these cases have been delivered to the enforcement department.”

Zhang describes how the EAS works. “We have devised a series of statistical models according to historic data. When we get a new case, we compare it with the model we have established. The model shows us a range of what is acceptable. If a case does not fall within this range, we calculate the bias of the new case and judge whether it is suspect. We can then deliver the case to the local authority to investigate.”

The system has been demonstrated to China’s top leaders. The head authority of the Customs General Administration has appraised the system, and local customs authorities have been made aware of the system and now use it to detect hidden risks in their own work.

### **Stabilising Duty Collection**

The system is helping China Customs to stabilise duty collection. “By incorporating data from banks – that is, paid duty – with data in the Customs which refers to liable duty, we can analyse duty stability visually. We import the bank’s data referring to paid duty, and these two variables fit in a linear

function. This is how we stabilise the collection. For example, once we put our data for the years 2000 and 2001 through this process, we saw that our paid duty rate fluctuated across the liable duty rate. This was a sign of unstable duty collection. However, one year after the implementation of the EAS and with appropriate measures taken, the paid duty rate became much more stable, and the system showed us that.”

China Customs also uses the SAS system to devise new methods to cover other aspects of the customs business, including all aspects of cargo supervision. Zhang gives an example: “For instance, in the importation of cigarettes, when we come across an individual case we cannot tell whether it is evading duty collection. However, if we use the EAS to compare the case on a national level with historic data, we can catch those cases that are evading paying the duty.”

For different customs districts, China has different patterns of import commodity structure. In order to ensure that equal commodity values fall into each tariff section nationwide, China Customs uses SAS to create a vector for each region to show the weight of commodity value in that tariff section. “Forty-one vectors are not easy to classify visually. Thanks to SAS, we can easily cluster the 41 customs districts to get different numbers of groups as we need them,” says Zhang. “Grouping is of great help to us in targeting customs districts with

low administrative quality with more accuracy and fairness.

“EAS also gives us convenience in interactive analysis,” she continues. “In the data loading period, subject data for price analysis is prepared. The end user can use SAS analytical tools to do interactive analyses.” For example, due to the diversity of commodities under the same code in the China Customs system, price distribution often looks very complicated. In some cases of multipeak distribution, SAS makes it easy to see that by applying a further limitation – such as a certain country of origin – the price is still subject to normal distribution.

China Customs uses the Web to disseminate information throughout the organisation. On the intranet, EAS has a series of indicators, falling into four catalogues, used to give quantitative assessment to customs districts. An intranet Web site is also available for information publication, and quarterly alerts are published there as well. Users can also see a scoring system, consisting of 12 main indicators, which is used to provide comprehensive assessment to the 41 regional customs districts.

### **Effective and Efficient Customs Management with SAS®**

“We chose SAS because we have a large amount of data – 23 years’ worth of historical information,” says Zhang. “This data records not only external trade at a national level, but also the performance of the customs department. We have devised a complicated statistical method and we do a micro-analysis of national statistics of external trade.”

Before China Customs established the system, they surveyed the British customs system, which uses SAS. This facilitated China Customs’ choice of the software. “We also studied many other users of similar types of systems and found that SAS is the world leader in data analysis,” continues Zhang. “The EAS plays a positive role in enhancing supervision and monitoring of China Customs’ administrative affairs. Incorporating SAS solutions and technology, such as SAS/AF®, SAS/STAT® and SAS/IntrNet®, EAS can effectively explore and analyse the vast amount of data generated through the clearance phase to produce useful information.”

Zhang says that based on the idea that clearance data records not only the compliance of importers and exporters but also the effectiveness and efficiency

of customs management, China Customs can assess the administrative ability of local customs by analysing that data. “EAS can dynamically monitor various aspects of customs operations, such as duty collection, execution of restrictive trade measures and supervision of processing trade,” she says. “Henceforth, instead of empirical judgment, quantitative evaluation can be obtained with less artificial factors. Also, isolated individual case studies turn to regularity and can be for tendency and trend analysis.

“Last year, with the help of the EAS, many hidden administrative risks were detected and substantial duty losses were retrieved. Apart from the direct financial effect, EAS has contributed more to indirect enhancement of the administrative ability of the customs,” says Zhang. “We even introduced EAS as a representation of the latest technological application to leaders of the State Council when they visited China Customs. Our system set a model of internal supervision and monitoring for other governmental organisations in China.”



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