Twenty-Fifth Meeting of the IMF Committee on Balance of Payments Statistics
Washington D.C., USA
January 14–16, 2013
(Rescheduled from October 29–31, 2012)

Implementation of the Change of Ownership Principle in Compiling Trade in Goods and Services Statistics of Hong Kong

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Economic development after 2008 global financial turmoil

The outbreak of the 2008 global financial turmoil and the continued intensification of the Eurozone sovereign debt crisis have dealt a severe blow to the economic situation in major advanced economies. The import demand from the advanced economies has remained weak amid the sluggish pace of recovery since the trade collapse of 2008-2009. The depreciation of USD and EUR against other major currencies has further exacerbated the already dampened import demand from the United States and European Union. In 2011, the merchandise import volumes of the United States and European Union markets were about 4.1% and 4.2% below the pre-crisis levels respectively (Figure 1).

Figure 1: Merchandise import volume indices of major advanced economies

Source: World Trade Organization

2. The spillover effect of waning final consumption demand in advanced economies has been widely felt across Asia, as manifested in the sharp deceleration in exports and production activities in Mainland China and other Asian economies since 2009. Being a small and highly externally-oriented economy, Hong Kong is easily affected by the vicissitudes on the external front. In 2011, Hong Kong’s total merchandise exports to the United States and European Union markets valued at US$88.7 billion, about 7.4% below the pre-crisis peak (Figure 2). The decline in import demand from advanced economies in turn led to a notable fall in Hong Kong’s trade balance with these economies. The visible trade surplus with the United States and European Union markets taken together narrowed significantly from US$49.8 billion in 2007 to US$22.5 billion in 2011.
In tandem with the lacklustre import demand from the advanced economies, many Hong Kong companies engaging in outward processing trade in Mainland China have been hard hit, facing severe drop in export orders from their clients in those economies. On the other hand, the increase in labour cost and the continued appreciation of Renminbi (RMB) constitute the main drags in production activities in Mainland China. Alongside the increase in minimum wages over the years, the average annual wage of staff and workers (consisting of all types of jobs at different levels) of the manufacturing sector in the urban areas of Mainland China increased by more than 1.3 times to RMB 36,665 in 2011 compared with 2005 (Figure 3a). Also, as of end-2011, the RMB exchange rate had appreciated over 30% and over 20% against the USD and EUR respectively since the RMB exchange rate system reform in July 2005 (Figure 3b).

Notably, structural changes in processing trade activities in Mainland China have emerged in the recent years, with the mode of operation transforming from “processing and assembling” to “processing with
imported materials”\(^1\). These changes have been driven by government policies in Mainland China in order to entail higher value added by expanding the value chain towards front-end activities such as design as well as towards back-end activities such as wholesale, retail and brand management. According to the statistics released by the Mainland China Customs, the share of exports of goods involving “processing and assembling” to total processing trade in Mainland China fell gradually from 20.2% in 2005 to 12.9% in 2011 (Figure 4).

**Figure 4: Mainland China’s exports of goods involving “processing and assembling”**

![Graph showing the share of “processing and assembling” to total processing trade from 2005 to 2011.]

Source: Customs, Mainland China

5. The aforesaid factors have a combined profound effect on Hong Kong’s processing trade activities (under the ownership of Hong Kong companies) in Mainland China. Latest survey data indicated that in 2011, about 13% of imports of goods were related to goods returned from Mainland China after processing, which fell significantly from the corresponding ratio of 23% recorded in 2005.

6. On the other hand, merchanting activities undertaken by Hong Kong companies have continued to prosper in recent years, despite some retreat in 2009 alongside strong headwinds in the external environment. Hong Kong traders engage in a substantial amount of merchanting activities to take advantage of their extensive trading network with buyers and sellers in the global market. The total value of goods sold without passing through Hong Kong amounted to US$456 billion in 2011, which was higher than the overall value of

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\(^1\) According to Mainland China Customs’ definitions, there are two types of inward processing trade, viz.: *processing and assembling* and *processing with imported materials*. *Processing and assembling* refers to the type of inward processing in Mainland China in which foreign suppliers provide all or part of the raw materials, parts or components under a contractual arrangement for the manufacture or assembling of products, which are for subsequent exportation from Mainland China by the foreign suppliers. Under this type of processing, the imported inputs and the finished outputs remain to be the property of the foreign suppliers throughout the whole process. *Processing with imported materials* refers to the type of inward processing in Mainland China in which the raw materials, parts and components are purchased with foreign currencies and imported by Mainland China’s processing units for the manufacture of products or semi-manufactures, which are for subsequent exportation to foreign markets from Mainland China. Under this type of processing, the ownership of the imported inputs has been transferred to Mainland China’s processing units. In compiling trade in goods and services statistics of Hong Kong under the new standards, adjustments are needed only for Hong Kong’s outward processing in Mainland China under *processing and assembling* contracts.
total exports of goods of Hong Kong, at US$438 billion.

Introduction

7. In the light of Hong Kong’s engagement in goods sent abroad for processing and merchanting over the years, the new international statistical standards based on the change of ownership principle, as set out in the *Sixth Edition of the Balance of Payments and International Investment Position Manual (BPM6)* and *2008 System of National Accounts (2008 SNA)*, would have a substantial impact on the presentation, compilation and interpretation of the trade in goods and services statistics of Hong Kong. In the past few years, the Census and Statistics Department (C&SD) of Hong Kong has been actively participating in international deliberations on this new development. A number of papers which present Hong Kong’s experience in studying the impact and drawing up the implementation plan of the new standards have been discussed among the international statistical communities on different occasions.

8. With the extensive work done and solid foundation established, Hong Kong formally implemented the change of ownership principle in recording goods sent abroad for processing and merchanting in the Balance of Payments (BoP) and Gross Domestic Product (GDP) compilation framework in September 2012. This paper highlights the development work in implementing the new standards in Hong Kong, elaborates on the practical difficulties encountered in data collection, discusses the results of the enhanced and new surveys, analyses the impact on the trade in goods and services statistics, and lastly depicts the dissemination arrangement in respect of the new series of statistics in Hong Kong.

Implementation of the new standards in Hong Kong

9. In preparation for the implementation of this new development, C&SD has conducted in-depth analyses and empirical studies on the processing trade and merchanting activities undertaken by Hong Kong companies. Companies in Hong Kong typically undertake three types of processing trade and merchanting activities: (a) outward processing, (b) merchanting, and (c) offshore trade activities involving outward processing. The following paragraphs highlight the development of new statistical surveys in C&SD in recent years underpinning the implementation of the new standards.

(i) Outward processing

10. Hong Kong’s outward processing activities are predominantly carried out in Mainland China. Processing trade in areas other than Mainland China has been relatively insignificant. Given the importance of processing trade between Hong Kong and Mainland China, C&SD has long been conducting the Survey on Trade Involving Outward Processing in the Mainland of China (OP Survey) since late 1980s to capture statistics on outward processing activities.

11. For the purpose of implementing the new standards, the OP Survey has been enhanced since the second quarter of 2008 to collect additional data in respect of the “processing and assembling” contracts. Enhancements include collecting additional information on the following items pertaining to imports from

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Mainland China which involve outward processing of goods under the arrangement of processing and assembling:

(a) value of raw materials/semi-manufactures sent from Hong Kong to Mainland China;
(b) value of raw materials/semi-manufactures purchased and delivered directly from places other than Hong Kong to Mainland China;
(c) value of manufacturing services on physical inputs owned by Hong Kong, with the following breakdowns:
   (i) processing fees paid by Hong Kong; and
   (ii) raw materials/semi-manufactures procured directly by Mainland China’s processing units.

12. To support the compilation of more detailed trade statistics under the change of ownership principle and the conduct of more in-depth trade analysis, the quarterly sample size of the OP Survey has been enlarged significantly (more than doubled) over the past several years. This has enabled the compilation of reliable estimates of the aforesaid additional breakdowns. As information collected from the OP Survey is available only with relatively long time lag, statistical data models have been developed to produce preliminary estimates of goods related to outward processing trade at an aggregate level under the new standards, at shorter time lag for timely compilation of BoP and GDP statistics.

13. The data models make use of timely figures of merchandise trade statistics as well as forecasting estimates for the values mentioned in paragraph 11 above as key input parameters. Some complexities are involved in forecasting the latter estimates as it has been observed from past information that the values of goods involving outward processing are subject to the effects of trend and seasonality. To address the issue, different autoregressive models with distinct time lag structure have been experimented. The results show that models with time lag of one quarter and of four quarters have expected signs and are both statistically significant at the 5% level, indicating that economic trends and seasonal patterns have been effectively taken account of in the forecasting models. The R-square is over 0.8 and the Durbin-Watson statistics are close to 2.0, which suggest that the models have fine explanatory power and no autocorrelation in residuals.

14. For each quarter, the data models are run in parallel and selected based on their past forecasting performance. A series of studies has been undertaken to evaluate the performance across different time periods. The forecasting performance of these models has been found to be robust and stable, with the average absolute percentage forecast errors in respect of the values of major aggregates being around 5%. In addition, the parameters of the models will be updated from time to time to improve their overall performance.

(iii) Merchancing and offshore trade activities involving outward processing

15. Considering the significance of merchancing activities in Hong Kong’s trade in services, C&SD has been collecting data related to merchancing activities via the Annual Survey of Imports and Exports of Services (ASIES) since the 1990s. Data on the sales of goods and cost of goods sold under merchancing are regularly collected to compile the value of merchancing services provided by Hong Kong traders.

16. Offshore trade activities involving outward processing refer to trading activities in which goods are processed under processing and assembling contracts (which broadly refer to processing arrangements in which goods are processed outside Hong Kong while under the ownership of Hong Kong companies), and subsequently sold to non-residents directly without the goods passing through Hong Kong. Under the previous treatment, the gross margin of offshore trade activities involving outward processing was recorded as trade in services. However, as the goods sold involve actual buying and selling activities (with a change of
ownership), the new standards of the *BPM6 / 2008 SNA* stipulate that sales of the goods should be recorded as trade in goods. The processing fee involved is to be recorded as import of manufacturing services on physical inputs owned by Hong Kong traders.

17. In order to support timely compilation of relevant macroeconomic aggregates under the new standards, a feasibility study was conducted in 2008 and 2009 to thoroughly assess the practicability of collecting quarterly data from, and the additional reporting burden on, respondents via an establishment survey. After considering overall results of the feasibility study, C&SD has implemented a new Quarterly Survey of Merchanting and Other Trading Activities (QSMTA) to collect quarterly data on merchanting and other trading activities of business establishments since the first quarter of 2010. The survey aims to meet the data requirements on merchanting arising from the new statistical standards in a timely manner and enable the compilation of reliable quarterly statistics to facilitate economic analysis of international trade flows and trade structure of Hong Kong.

18. To minimise respondent burden, however, only aggregate data are collected in QSMTA at quarterly intervals for timely compilation of quarterly BoP and GDP statistics under the new standards. More detailed data, e.g. the value of sales of goods under merchanting by broad commodity group and by country/territory, continue to be collected on an annual basis, via the ASIES.

19. Apart from collecting the value of sales and cost of goods sold under merchanting, the new quarterly survey also collects additional data related to offshore trade activities involving outward processing, which cannot otherwise be collected from trade declarations or the OP Survey of which the reporting unit is based on trade declarations, as these goods do not cross the boundary of Hong Kong. The following additional data are collected on offshore trade activities involving outward processing activities via the QSMTA:

- (I) value of goods sold offshore after processing;
- (II) cost of goods sold offshore after processing, with further breakdowns into:
  - (a) value of raw materials/semi-manufactures sent from Hong Kong to the processing economy;
  - (b) value of raw materials/semi-manufactures purchased and delivered directly from places other than Hong Kong to the processing economy;
  - (c) value of manufacturing services on physical inputs owned by Hong Kong, with the following breakdowns:
    - (i) processing fees paid by Hong Kong; and
    - (ii) raw materials/semi-manufactures procured directly by the processing units abroad.

20. To improve the efficiency of data collection, the sample for QSMTA is selected with reference to the findings of previous rounds of the ASIES to cover those industries with significant merchanting or trade in services transactions. Establishments found to be very prominent in terms of trade in services or merchanting receipts (based on the survey returns in previous rounds of ASIES and QSMTA) in their respective business sectors are included in the QSMTA sample as certainty cases. These cases are selected at the start of a reference year and are enumerated for the four survey quarters in that year. For the Q1-Q4 2011 survey rounds, around 1 000 certainty cases were selected. The other establishments in the sampling frame are enumerated on a sample basis. On average, about 4 000 establishments are selected for enumeration in each survey round of QSMTA. The coverage of the QSMTA is reviewed on an annual basis to ensure a good representation of establishments engaged in merchanting and trade in services activities in the survey.

21. The same survey form was used for all industry sectors covered in the QSMTA for the reference
quarters in 2010. Based on the experience in the Q1-Q4 2010 survey rounds, some transaction items are observed to be highly concentrated in a few industry groups only. For example, the 2010 survey results indicated that the main bulk of merchanting activities were carried out by establishments within the import and export trade sector which together accounted for over 99% of the values of sales of goods and costs of goods sold under merchanting. It is thus considered more cost-effective to adopt industry-specific QSMTA questionnaires for different groups of target respondents. Starting from Q1-Q4 2011 survey rounds, four industry-specific survey forms are designed for specific industry groups, requesting respondents to provide data only on those items relevant to their business, thereby minimising respondent burden and enhancing the efficiency of data collection.

**Difficulties encountered in data collection**

(i) *Outward processing*

22. When the enhanced OP Survey was first set up, one major difficulty regarding data collection was that in undertaking the fieldwork of the survey, a significant proportion of respondents were logistics companies ³ (rather than the owners of imported processed goods) which generally do not have readily available information pertaining to the new data required. To resolve this problem, C&SD had made considerable efforts in establishing rapport with major logistics companies through liaison meetings, courtesy visits and professional persuasion in the past years, so that these logistics companies could either acquire the relevant information from the goods owners themselves or provide the contact details of the goods owners for subsequent follow-up by C&SD. This established practice has successfully reduced the non-response rate of logistics companies to a reasonably low level. As a result, the overall response rate of the enhanced OP Survey is maintained at a relatively high level of around 85% in recent years.

(ii) *Merchanting and offshore trade activities involving outward processing*

23. Implementing the new standards for merchanting is more challenging than initially anticipated. It involves not just simply reclassifying the readily available data on net merchanting from services to goods, but also presenting merchanting data on a gross basis. Fieldwork experience of QSMTA indicates that many respondents do not have readily available up-to-date quarterly information on the values of sales of goods and costs of goods sold in respect of merchanting, though they have rather up-to-date quarterly information on gross margins related to merchanting activities on hand. The reason is due to the late availability of bills of sales, resulting from a common business practice for companies to receive such bills at a certain time lag after the completion of the merchanting transactions.

24. For supporting timely compilation of BoP and GDP statistics, preliminary estimates of quarterly merchanting statistics under the new standards have to be available at very short time lag. However, the proportion of completed survey cases available for use in the compilation of preliminary estimates (at a time lag of about three weeks after the end of the reference quarter) in the QSMTA is generally around 40%. Refined imputation procedures have to be constructed based on historical reported data of outstanding sampled cases as well as other existing information. The quality of data collected via the QSMTA is to be ascertained by comparing the quarterly estimates with similar data collected for the full year via the ASIES.

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³ It is a common phenomenon in Hong Kong that logistics companies take orders from the owners of processed goods to handle the shipment of goods as well as the submission of trade declarations. Logistics companies which are sampled in the OP Survey are mainly freight forwarders/cargo consolidators, carriers (e.g. airline and transportation companies) and couriers.
Results of the enhanced and new surveys

(i) Enhanced survey on outward processing

25. Preliminary estimates from the enhanced OP Survey have been evaluated and found to be stable and consistent with Hong Kong’s general trading pattern. For example, machinery, mechanical appliances and electrical equipment consistently accounted for the largest proportion of imports from Mainland China involving outward processing under the arrangement of processing and assembling, followed in descending order of prominence by sound recorders and reproducers, television image and sound recorders and reproducers, and articles of apparel and clothing accessories (textile garments).

26. The enhanced OP Survey also enables the analysis of the import value from Mainland China involving the arrangement of processing and assembling by component for 2011 as follows:

(a) around 70% was related to raw-materials/semi-manufactures sent from Hong Kong to Mainland China;
(b) around 10% was related to raw-materials/semi-manufactures purchased and delivered directly from places other than Hong Kong to Mainland China;
(c) around 20% was related to manufacturing services on physical inputs owned by Hong Kong, which include processing fees paid by Hong Kong and value of raw-materials/semi-manufactures procured directly by Mainland China’s processing units.

27. These structural ratios are observed to be relatively stable at an aggregate level across different time periods. At commodity level, processing fees consistently account for a relatively higher share of the import value of toys, games and sports requisites than other commodity groups, which also appears reasonable as these goods generally require more hand-made components and higher product standards.

28. Although data collected from the OP Survey are available only with longer time lag, they can be used to calibrate the preliminary estimates of trade aggregates produced by statistical data models, and to support more in-depth analysis. The resulting statistics, especially the structural ratios at commodity level, also serve to regularly update the parameters of the data models.

(ii) New survey on merchanting and offshore trade activities involving outward processing

29. Results of the QSMTA indicated that the value of goods sold offshore involving outward processing under the arrangement of processing and assembling was not large for Hong Kong in 2011, less than 10% of the total value of goods sold offshore. Of the cost of goods sold offshore under the arrangement of processing and assembling for 2011:

(a) around 35% was related to raw-materials/semi-manufactures sent from Hong Kong to the processing economy;
(b) around 40% was related to raw-materials/semi-manufactures purchased and delivered directly from places other than Hong Kong to the processing economy;
(c) around 25% was related to manufacturing services on physical inputs owned by Hong Kong, which include processing fees paid by Hong Kong and value of raw-materials/semi-manufactures procured directly by the processing units abroad.

30. Final response rate of the new QSMTA is generally maintained at 90% each quarter. Results of this
new survey are compared with those of the ASIES to ensure that the quality of quarterly estimates will not be compromised for timeliness.

**Impact on trade in goods and services statistics of Hong Kong**

31. The statistics under the new standards are useful for the analysis of various aspects of globalisation in the international trade of Hong Kong. Based on the estimates for the reference year of 2011, the following paragraphs present some salient analyses and highlight the impact on the trade in goods and services statistics of Hong Kong under the new standards.

32. First, trade in goods statistics under the new standards can better reflect the genuine trading value of Hong Kong, irrespective of whether the goods traded pass through the boundary of Hong Kong. Under the *BPM6 / 2008 SNA*, exports of goods were estimated to be US$438 billion in 2011. Among these exports, US$386 billion was conventional exports of goods (Figure 5). The latter included the subsequent re-exportation of the processed goods returned to Hong Kong but excluded goods sent abroad for processing (US$53 billion). Under the new standards, two new components are added. The value of goods sold offshore after processing was estimated to be US$25 billion while the net value of goods sold under merchanting, which did not pass through the boundary of Hong Kong, was estimated to be US$28 billion. As a result, the value of exports of goods in 2011 under the new standards was incidentally to the same as that under the old standards, though this was not necessarily the case in normal situation.

**Figure 5: Exports of goods under the old and new standards, 2011**

![Figure 5: Exports of goods under the old and new standards, 2011](image)

† The value of total exports of goods under the new standards was incidentally the same as that under the old standards in 2011 only. In previous years, the value of total exports under the new standards was generally smaller than that under the old standards.

33. The value of total imports of goods under the new standards amounted to US$447 billion in 2011, notably smaller than that under the old standards (US$494 billion). The new statistics reflect more closely the value of goods procured by Hong Kong traders for engaging in international trading activities, irrespective of whether the goods are actually imported into Hong Kong. The new statistics exclude goods returned to Hong
Kong after processing in the processing economy, but include raw materials/semi-manufactures purchased by Hong Kong companies and delivered directly from places other than Hong Kong to the processing economy (Figure 6).

**Figure 6: Imports of goods under the old and new standards, 2011**

34. After implementing the new standards, the balance of trade in goods of Hong Kong generally exhibited a structural change from deficit to surplus in past years (Figure 7). The trade in goods surplus recorded under the new standards was largely due to the exclusion of trade in goods sent abroad for processing and the inclusion of the net value of goods sold under merchanting in exports of goods. It is interesting to note that in 2011, the balance of trade in goods recorded a deficit under the new standards, albeit at a much smaller magnitude than that based on the old standards. The small trade in goods deficit recorded in 2011 under the new standards was mainly attributed to the combined impact of dampened export demand in advanced economies and a rather buoyant import demand for supporting consumption and inbound tourism locally, thus leading to a deficit in the balance of conventional trade in goods (Figure 8).
As regards trade in services, the statistics under the new standards showed that Hong Kong imported a substantial amount of manufacturing services on physical inputs owned by Hong Kong companies in 2011, with an estimated value of US$17 billion. This accounted for 24% of total imports of services (US$74 billion) in 2011, and reflected Hong Kong’s active involvement in the outward processing activities. The composition of imports of services in 2011 under the new and old standards is shown in Figure 9.
36. For exports of services, the gross margin of merchanting is taken out under the new standards, as merchanting is now recorded as trade in goods rather than trade in services. The total exports of services under the new standards amounted to US$93 billion in 2011, with major components shown in Figure 10. In comparison, the total exports of services in 2011 under the old standards stood at US$122 billion.

37. The implementation of the new standards generally changed the balance of trade in services of Hong Kong from surplus to deficit in past years, due to the exclusion of exports of merchanting services and inclusion of imports of manufacturing services on physical inputs owned by others (Figure 11). Yet, in 2009-2011, the balance of trade in services saw an increasing surplus, as imports of manufacturing services declined (Figure 12) while exports of travel services and financial services grew significantly in those years (Figure 13).
Figure 11: Balance of trade in services under the old and new standards

US$ billion

Figure 12: Imports of manufacturing services on physical inputs owned by others

Share of imports of services (%)
38. As the implementation of the new standards alone involves only the re-classification of components of trade in goods and services, the overall balance of trade of goods and services of Hong Kong remains unchanged, though the balance of trade in goods and the balance of trade in services both record significant changes individually as described above. This implies that the levels and growth rates of overall GDP and the overall current account balance under BoP are not affected by the implementation of the new standards.

**Dissemination of the new statistics in Hong Kong**

39. Subsequent to the BOPCOM meetings in 2007 and 2008, consultations and discussion sessions with major data users in both the public and private sectors of Hong Kong have been undertaken to solicit their views and suggestions regarding the introduction of the new standards in recording goods for processing and merchanting. While our major users generally appreciate and support the implementation of the new standards in the BoP and GDP compilation frameworks, some of them request for the provision of a transition period to allow them more time in adapting to the new standards. In this connection, for the new trade in goods and trade in services components in GDP statistics, a special interim dissemination arrangement is adopted till 2014 whereby the conventional trade statistics in the existing GDP framework will continue to be published in the quarterly GDP report, while the new data series based on the change of ownership principle will be presented as supplementary tables in the same report. Nevertheless, the overall GDP levels and growth rates remain unchanged under both the old and new presentation formats. For BoP statistics, only the new trade in goods and services figures will be presented in the quarterly BoP report, given that analyses in the context of BoP often focus more on the balances of broad components in the current account (e.g. goods and services balance or current account balance, which will be the same under the old and new standards) and their relationships with the financial account.

40. Taking into account the progress in the compilation of the revised BoP and GDP data series, views and suggestions from our major data users as well as international commitment, C&SD has incorporated the latest international standards in the BoP and GDP compilation systems and released the revised data series of BoP and GDP statistics of Hong Kong in September 2012. As a result of the revision, the quality and
international comparability of the BoP and GDP statistics are enhanced. Briefing sessions with major stakeholders were arranged in August/September 2012 to introduce the conceptual and methodological aspects of the revision. The reports *Balance of Payments, International Investment Position and External Debt Statistics of Hong Kong, Second Quarter 2012* and *Special Report on Gross Domestic Product – September 2012* were also published in September 2012 to present the revised data series and related conceptual and technical details.

**Concluding Remarks**

41. While Hong Kong has implemented the change of ownership principle in compiling trade in goods and services statistics, the structural changes on the external front witnessed in the past few years remind us of the need to stay alert to the development in global economic and financial environment, and to proactively take this into account in the compilation and interpretation of the statistics. We will also maintain close liaison with major data users to ensure smooth transition in disseminating the new series of trade in goods and services statistics under the GDP framework.

Census and Statistics Department  
Hong Kong Special Administrative Region, China  
October 2012