

From Manufacturing Cross-Border
Operations to Regional Economic Integration
Evolution of Hong Kong's Economy and the
Guangdong Factor

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Introduction

The economic reform and new openness in mainland China since 1978, and particularly the establishments of the four special economic zones (SEZs) — Shenzhen, Zhuhai, Shantou and Xiamen — have attracted a huge influx of foreign direct investment (FDI) into China (Yeung and Chu, 1998). Initially the FDI from Hong Kong to China mainly took the form of manufacturing cross-border operations (CBOs) — or offshore production — in Guangdong and especially in the SEZs, in order to exploit the cheap labour and land costs there in the early 1980s. These manufacturing CBOs then began to spread, extending from Shenzhen to the north to the rest of the Pearl River Delta (PRD) region in Guangdong following the opening of the latter in 1987. In fact, 1987 represents a turning point in Hong Kong's manufacturing production in terms of its input-output relations as well as its employment structure (Tuan and Ng, 1995d), industrial structure and competitive patterns (Ng, 1995) via an expansion in scale with little significant change in total factor productivity (TFP) performance (Ng and Tuan, 1997a; Tuan and Ng, 2000b).

Deng's speech in 1992 reaffirming China's economic reform served as a catalyst for further heavy FDI inflows into China, particularly from small entrepreneurs in Hong Kong. The source of Hong Kong's economic growth has moved from domestic exports to re-exports and its "trade derivatives" (Tuan and Ng, 1998a).¹ This re-exports trade and its "derived" activities were a product not only of the increasing service content of Hong Kong's manufacturing production other than CBOs but, more importantly, by the expansion of Hong Kong's economic boundary into the PRD (Tuan, Ng and Wong, 1998a) to form a "mega-city," functioning as an economically-integrated region (Tuan and Ng, 1995b, 2001b; Yeung, 1999) and being described as a "mega-city" or core-periphery (Hong Kong the core, PRD the periphery) system (Tuan, Ng and Wong, 1998a; Tuan and Ng, 2001b). Such regional specialization in resources (in labour and land) has demonstrated the economic advantages being derived from the agglomeration economies generated by the Hong Kong-PRD region (Tuan and Ng, 2001a).

The objective of this paper is to discuss the major findings of research performed by the authors, mainly since the early 1990s, into the evolution of Hong Kong's manufacturing industry and its impact on Hong Kong's economic development during the past two decades.² The main aims are (1) to describe the major phenomena of Hong Kong's FDI in China and its diffusion process; (2) to review the patterns of the evolving manufacturing FDI and its service-oriented activities; (3) to examine the economic growth of Hong Kong in the context of agglomeration economies; and (4) to discuss the future direction of growth in Hong Kong that can be achieved by increasing its competitive advantage.

Manufacturing Transformation since the 1980s: From Manufacturing to Manufacturing Management

The Evolution of Manufacturing FDI

In the 1980s, Hong Kong's manufacturing production activities

were mainly manifested in the form of the evolving CBOs in the adjacent PRD and subsequent expansion via plant relocations with more service operations. The evolution of cross-border processing in China, and especially in Guangdong, can be described in three stages:

(1) cross-border operations (1980-1987) in the form of subcontracting, which caused a rapid increase in outward processing trade (OPT) and, consequently, precipitated the turning point in Hong Kong manufacturing production noted in 1987;³

(2) direct outward investment (1988-1992), mainly in the middle stream of manufacturing production to generate the maximum real rate of growth in re-exports; and

(3) whole-plant relocation (since 1992) to Guangdong, which prompted the second wave of heavy FDI. By relocating the whole manufacturing plant, with more service-oriented operations moving to the north, Hong Kong's manufacturing sector began to be transformed into one dealing in manufacturing management.

FDI Diffusion and its Major Characteristics

These three stages and their corresponding effects can be summarized as follows.⁴

Stage I: Cross-Border Operations in Manufacturing (1980-1987)

- There was a contraction of manufacturing industries in Hong Kong due to CBOs in the PRD, including subcontracting partial manufacturing operations, original equipment manufacturing (OEM), and joint operations involving no financial investment.
- The prime locations of investment were in SEZs and other PRD cities/counties being opened up at the time.
- Manufacturing processing/assembly, product inspection and packaging were the major manufacturing

operations performed in the cross-border establishments.

- Resource costs, such as high rental, shortage of labour supply and high wages in Hong Kong, were the dominant factors behind Hong Kong firms' move into CBOs. The secondary reasons were an unstable political climate and the opportunity to penetrate the overseas market (mainland China).
- The major problems encountered by the firms performing CBOs in China at this stage were the shortage of managerial staff, inadequate business regulations/laws, government administrative inefficiency and the lack of a supporting infrastructure.
- The major heavy outward processing industries included electronics, watches and clocks, toys, textiles, and garments/clothing.
- The manufacturing CBOs were mainly founded in areas of labour-intensive production.

Stage II: Direct Outward Investment in Manufacturing (1988-1992)

- More than 85 per cent of Hong Kong investment in Guangdong was in the PRD, where Hong Kong accounted for 80-90 per cent of foreign investment.⁵ In 1992, Guangdong's export values accounted for 32 per cent of those of China as a whole, while the export values of the PRD amounted to 74 per cent of those of the whole province.
- The decline in concentration on industrial manufacturing was accompanied by an increasing concentration on service industries. A shift in the balance between manufacturing and services, and the accompanying restructuring of input-output relations and industrial competitive patterns, were observed in Hong Kong.

- The increase in the amount of Hong Kong FDI in Guangdong was found to be in inverse proportion to the distance in highway miles from Hong Kong, following the gravity model analysis. The other two key factors were labour supply and market potential.
- Approximately 80 per cent of firms relocated all or part of their manufacturing processes, especially to SEZs and the PRD. About 55 per cent maintained only trading activities and industrial management business in their Hong Kong headquarters.
- Comparisons between the Guangdong subsidiaries and the Hong Kong parent firms reveal that the Guangdong firms were larger in both plant space and workforce, had higher capital expenses, and were more labour-intensive, with much lower labour productivity, a shorter pay-back period, and higher returns and exports.
- There was significant expansion in Hong Kong manufacturing firms' scale of production in Guangdong via CBOs and plant relocation with the same production technology.
- Outward investment benefited from economies of scale with the aid of analyses of the production function at industry level.
- There was insignificant manufacturing TFP growth in the last two decades, except for a separate, one-off jump in 1987 resulting from structural adjustments in production, such as expansion in scale. The outward investment contributed little to local TFP growth due to difficulties in upgrading local manufacturing's basic production technology.
- There were strong relationships between manufacturing and trade loans/advances and the corresponding commodity trade and trade derivatives activities. A significant turning point in 1987 was confirmed.

However, weakening associations between the growth of manufacturing production — and trade — and the growth of institutional financing after 1987 illustrated the diminishing contribution of Hong Kong's financial services to local manufacturing.

- Local manufacturers, being dominated by small firms and higher management costs in association with small-scale loans, encountered difficulties in competing for loanable funds.
- There was further emigration of local plants with more service operations moving north. Manufacturing management functions, including both the upper and lower stream of manufacturing operations, were further relocated to the PRD.

Stage III: Whole-plant Relocation and Outward Service Processing (1992-)

- Foreign investment of Hong Kong origin remained the dominant source of FDI in Guangdong. Along with FDI from Taiwan, it constituted more than 90 per cent of FDI in Guangdong in 1998.
- Completion of manufacturing processing and relocation of the whole production plants; while investment decisions on major plant locations remained unchanged. There were increasing relocations in operations of a service nature, such as research and development (R&D), design, prototype manufacturing, shipping and exporting, as well as after-sales service and marketing management.
- Across the region, there was deepening division of labour in management functions between Guangdong and Hong Kong. Only the high service-content operations, such as R&D and the marketing functions of manufacturing, remained in the Hong Kong headquarters. Such a phenomenon can be described as

“intra-firm” division of labour with physical plants (manufacturing operations) being relocated in the peripheral PRD region, while the pure “service operations” remained in the main core, Hong Kong.

- The distance between the manufacturing facilities in the PRD and the service facilities in Hong Kong would be balanced by the various transaction costs associated with the economies and diseconomies of agglomeration.
- At the firm level, the effect of gravity (distance) on manufacturing FDI measured by production, investment amount, firm size and age, and location density was confirmed.
- The clustering effect of firms in a location was inversely dependent on the distance from the main core while smaller firms were more responsive (elastic) than large ones.
- Taking the electronics industry as a representative case, five major networked clusters of locations of electronics firms were identified — Shenzhen, Guangzhou, Huizhou, Panyu and Shantou — along with their corresponding satellite cores. The satellite cores with the top 15 cities/counties accounted for 87 per cent of the total electronics FDI in Guangdong.
- Given Hong Kong as the core, FDI to the Guangdong region was found to depend on population agglomeration, market potential, inverse of distance from Hong Kong, and size of the cities/counties. Such effects were more significant in manufacturing than service firms.

Cross-Border Operations in Manufacturing and Evolution in Trade: From Conventional Trade to Trade Derivatives

A long-term relationship between trade by components in

domestic exports and re-exports (secondary domestic exports) and output growth was observed in the period 1961-1995. Three stages of trade development can be identified corresponding to the evolution — in three stages — of outward manufacturing processing and investment. First, there was rapid annual growth in domestic exports, averaging 11 per cent per annum from the 1960s till 1987. However, from the fourth quarter of 1987, re-exports generated by CBOs in manufacturing grew at a rate of 24.1 per cent per annum. Consequently, after 1988, the value of re-exports exceeded that of domestic exports. Second, there was steady growth in re-exports from 1988 to 1992, accompanied by a widening gap with domestic exports in terms of value. Third, there has been declining re-exports growth since 1992 — averaging 9.1 per cent for 1993-1999 — and a rise in offshore trade including transshipments and triangle trade.⁶

Table 1 demonstrates the increasing significance of trade involving outward manufacturing process activities, the decreasing importance of local manufacturing in terms of number of firms, employment figures and value-added, and the corresponding increasing significance and participation of trade manufacturing (manufacturing management). Table 2 provides some basic statistics for Hong Kong's domestic exports, commodity re-exports and offshore trade since 1961 in order to explain the growth patterns in terms of the nature of trade in the three stages. The pattern of trade evolution is explained by the dominance of commodity trade from 1961 to 1987, re-exports trade from 1980 to 1992 and offshore trade from 1993 to 1999.

Along with the evolution of cross-border manufacturing in Guangdong, the impact of such outward investment on the changing trade pattern is critical. The relations between the evolving outward manufacturing investment and trade and their effects on the changing industrial structure were also discussed by the authors (Ng and Tuan, 1997a). In fact, the growth of re-exports trade in the 1980s and consequently in "trade derivatives" since 1992 have contributed to the sustained economic growth of Hong Kong over the past 30 years (Tuan and Ng, 1998a).

Table 1 Hong Kong's Manufacturing and Outward Processing Trade, 1990-1999

	1990	1992	1995	1997	1998	1999
Imports from China involving outward processing (%)	61.8	72.1	74.4	81.2	82.7	80.5
Re-exports of China origin involving outward processing (%)	74.1*	78.3	82.2	88.4	87.6	86.6
Number of manufacturing firms	51820	41710	27600	24930	22430	—
Number of trade manufacturing firms**	—	12580	24860	25980	21640	—
Employment in manufacturing ('000 person)	762.6	592.4	368.0	290.0	251.7	—
Employment in trade manufacturing** ('000 person)	—	73.1	148.4	146.4	144.8	—
Manufacturing value-added (HK\$10 billion)	92.2	97.4	84.4	80.0	70.8	—
Trade manufacturing value-added (HK\$10 billion)	—	17.9	52.0	68.8	63.2	—

Notes: * 1991 figure; **Import/export firms with manufacturing-related functions, that is, firms engaging in trade manufacturing or manufacturing management.

Source: Compiled from Census and Statistics Department, 2000. *Statistical Digest of the Services Sector*. Hong Kong: Government Printer.

Table 2 Growth of Hong Kong's Domestic Exports, Re-exports, and Offshore Trade, 1961-1999 (%)

	Commodity Export Trade	Commodity Re-exports	Services Exports	Offshore Export Trade
1961-1979	11.7	12.1	6.2	—
1980-1987	10.4	24.1	8.3	3.3**
1988-1992	1.9	27.0	6.2	3.1
1993-1999	-3.7	9.1	4.0*	10.2*

Notes: All values in real terms; * 1993-1998; ** 1981-1987.

Source: Compiled from Census and Statistics Department. 2000.
Estimates of Gross Domestic Product, 1961-1999. Hong Kong:
Government Printer.

Formation of the Hong Kong-PRD Mega-City: From Hong Kong to the Hong Kong-PRD Economic Region

Based on the authors' longitudinal study of the intensive outward investment over the past 20 years and its diffusion into Guangdong and especially the PRD, we believe that any meaningful interpretation of the Hong Kong's economy should really consider Hong Kong Special Administrative Region (SAR) and its proximate region — the "Greater Hong Kong" — as an integrated Hong Kong-PRD economic region. In fact, manufacturing CBOs have hastened the economic integration and development of these two regions into a "mega-city" economy, with Hong Kong as its core (Tuan and Ng, 2001a). At the macro-level, gravity or distance from the main core was confirmed as a frictional factor inversely affecting the amount of FDI flows into the peripheral areas (Tuan and Ng, 1995b). Recent statistics show that in 1998, the total amount of outward FDI from Hong Kong was US\$12.8 billion, of which 54.3 per cent was invested in mainland China, with 65 per cent of that in Guangdong.

Together, the SEZs and the PRD accounted for 65.5 per cent of Guangdong's total FDI.

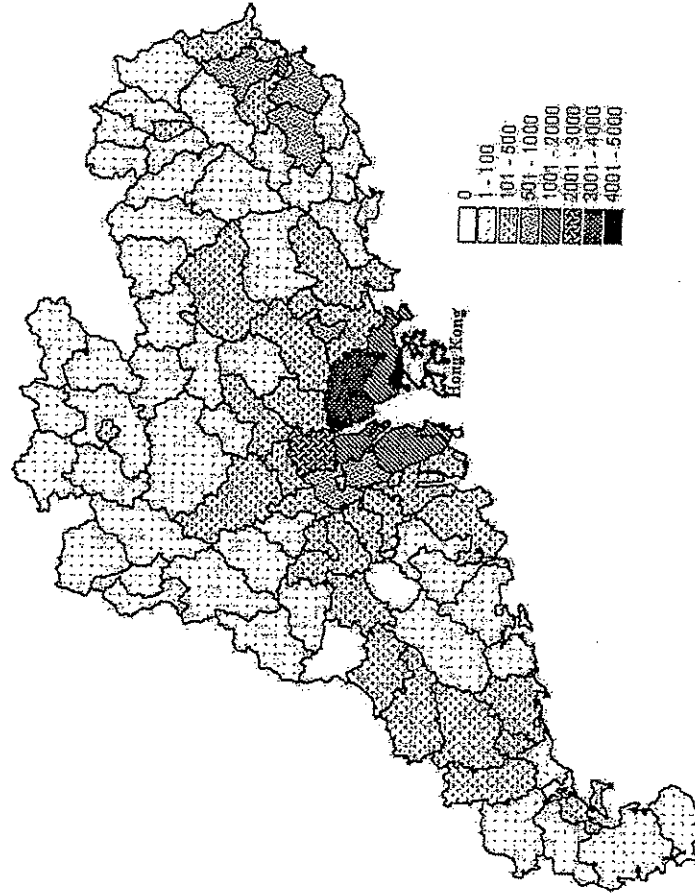
Of 37,724 foreign enterprises operating in Guangdong,⁷ 82 per cent were manufacturing firms (with 90 per cent of Hong Kong origin) and most of the joint ventures were of small and medium size with average investment of US\$4.16 million and average employment of 160 people. With the majority of the investment (83.3 per cent) coming from Hong Kong, investment was found located mainly in the PRD cities/counties nearest the city core Hong Kong. Half of the joint ventures were found in SEZs and 68.7 per cent in the PRD region as a whole. Figure 1 illustrates the effect of the distance factor on FDI and firm location decisions. There is a clear pattern of diminishing intensity in terms of the number of manufacturing firms from Hong Kong, to Shenzhen in the north, then to the other PRD cities/counties, and then other peripheral areas (Figure 1). The same pattern is observed in the amount of manufacturing investment.

The spatial effect of this relocation of Hong Kong manufacturing firms primarily to their own backyard in Shenzhen with concentrations in the adjacent PRD has facilitated the economic integration of Hong Kong and the PRD to form a mega-city economy. It was found that the economic boundary of the Hong Kong-PRD economic region coincided approximately with the geographic boundary of the PRD, 196 kilometres in diameter or three hours travel by road (Tuan, Ng and Wong, 1998a). Only when further expansion of business is considered would Hong Kong manufacturers choose the Shanghai or Beijing metropolises in addition to their current production sites (Tuan and Ng, 1998b).

The Significance of a Core-Periphery Economic System: Future Development via Utilization of Agglomeration Economies

The development of the Hong Kong-PRD region can, in fact, be

Figure 1 Distribution of Manufacturing FDI Joint Ventures in Guangdong by Number of Establishments



well explained by the theory of pattern of land use (Alonso, 1964). In addition, Henderson's (1988) view of urban agglomeration and development, Krugman's (1991, 1993) view of economies of urbanization in the context of spatial economics, and Richardson's (1995) suggestions regarding the economies and diseconomies of urban agglomeration serve as good references in this case. These factors further explain the significance and development of Hong Kong-PRD (core-periphery) as an integrated system in generating agglomeration economies. In constructing the agglomerative implications of the Hong Kong-PRD region, the source or provider of the various economies due to agglomeration in the Hong Kong-PRD context can be well defined (Tuan and Ng, 2001b) to include economies of scale, shared inputs, transaction costs, and knowledge spillovers.⁸

The Hong Kong case is consistent with Chinitz's (1961) study of the development of New York and Pittsburgh, with its suggestion that an urban environment with many small-sized firms and heterogeneous production is more conducive to local economic growth. Firm relocations and FDI diffusion from Hong Kong to the PRD were the result of a desire to exploit the agglomeration economies as provided by the main core while balancing the benefits of agglomeration with the diseconomies arising from spatial diffusion. Furthermore, following the development of a core-periphery system, a few of the existing PRD cities/counties leveraged their corresponding supplementary functions by forming networked clusters within the mega-city and further exploiting the economies of urban agglomeration.⁹ In this regard, Hong Kong SAR and the PRD are mutually dependent.

In fact, at the macro-level, the agglomeration economies being generated by the formation of the core-periphery system have functioned as a buffer to absorb the potential for economic disturbances since the 1980s and especially after 1997. Any further economic growth for Hong Kong will rely on continuous co-operation with Guangdong taking advantage of the core-

periphery system (Tuan and Ng, 1995b, 1998a, 2001b). This development has been aided by the growth and globalization of Hong Kong's financial market, which has also contributed significantly to cross-border trade and its derivatives (Tuan and Ng, 1998b).

Nevertheless, the globalization of the financial and banking sectors also crowded out, in one way or another, the development of local manufacturing in the last decade. From a longer-term perspective, Hong Kong SAR's sustainable growth requires a well-balanced, more diversified economy, including a well-developed manufacturing sector. In this context, the development of the PRD as a strong manufacturing base is inevitable.

Conclusion

To achieve sustained growth via the agglomeration economies of the Hong Kong-PRD core-periphery economic system, favourable government policy is critical. Government policy must promote the continuous influx of FDI into the region from the rest of the world and help enhance the region's competitiveness. While "One Country Two Systems" is an essential element in mobilizing foreign investment,¹⁰ the Hong Kong SAR government's proactive attitude towards regional economic integration is also important. As for the Guangdong government, reviewing its FDI promotion policy to enhance the flow of FDI is essential. Government/government administration in Guangdong is in critical need of improvement.¹¹

Besides a strong economic base, the key factor in remaining competitive is building up a favourable investment environment for the Hong Kong-PRD region as a whole.¹² The research findings revealed that government/government administration, restrictions on business operations, and infrastructural support were cited as the three key factors in establishing such an environment for FDI promotion in Guangdong.¹³ FDI was found to respond differently to these common factors depending on,

for example, whether it was directed at manufacturing or services, what size the firms were, and where the investment had come from. Compared with service firms, for example, manufacturing firms in Guangdong would rely more on fewer business restrictions on their operations and less on demands over living and social conditions.¹⁴ Such results demonstrate the significance of flexibility and heterogeneity in government-designed FDI policies and of environmental factors in catering to the needs of the various attributes of FDI.

Based on Hong Kong's successful experiences in building up a business-friendly environment over the last 30 years, the best ways for Hong Kong SAR to contribute more to the region include:

- professional training and management development for the PRD;
- services rendered to Hong Kong business, SMEs in particular, in Guangdong;
- greater coordination of region-wide infrastructure projects and development planning. To make collaboration more effective, the Hong Kong SAR government should consider the possibility of using part of its reserves to form joint ventures for some key projects.

The most critical implication of our mega-city hypothesis is that any benefit accruing to the PRD would eventually benefit Hong Kong SAR as well. After all, Hong Kong SAR has shown itself most willing to facilitate the sustainable growth of the PRD and the reverse is also true.

Notes

1. The term "trade derivatives" was used to describe any further trade activities evolved or "derived" from traditional or conventional trade activities and operations to capture the normal nature and characteristics of trading per

- se; the examples are transshipments and triangle trade (Tuan and Ng, 1998a).
2. This paper intends to provide a summary of major empirical findings of selected research related to the subject by providing an overview along with essential details. Interested readers are referred to the references for detailed discussion and analyses of the research findings. For some background on the development of Hong Kong's manufacturing industry and related research during earlier stages, see Tuan (1982, 1989); Tuan and Lin (1988); Lin and Tuan (1989); Ng and Tuan (1991); Tuan, Wong and Ye (1986); Tuan and Wong (1994); and Tuan and Ng (1995a, 1995c).
 3. CBO or OPT refers to the importing of processed goods from China, the SEZs and the PRD in particular, where all or part of the goods' raw materials or semi-manufactures are, under contractual arrangement, originally exported from or through Hong Kong to China for processing.
 4. For detailed discussion and analyses of the empirical findings corresponding to the three stages, the following major references were suggested. For Stage I, see Tuan and Ng (1994, 1995a). For Stage II, see Tuan and Ng (1995b, 1995d, 1998a, 2000b); Ng (1995); Ng and Tuan (1996, 1997a); Tuan, Ng and Wong (1998a, 1998b). For Stage III, see Tuan and Ng (1998a, 2001a, 2001b, forthcoming b).
 5. Statistics reported by the Hong Kong Trade Development Council in 1993.
 6. A detailed discussion of the trade evolution, especially the induced OPT and its "derivatives," can be found in Tuan and Ng (1998a).
 7. *Database of Joint Ventures in Guangdong, 1998*, released by the Guangdong Provincial Government, was designed to allow those doing business in Guangdong to search business information in the area.
 8. Quigley (1998) identifies four major factors including economies of scale in production and consumption, shared inputs in production and consumption, transaction costs in production and consumption, and statistical economies in production and consumption. The five factors generating agglomerative implications in the case of Hong Kong include those four factors plus knowledge spillovers (Tuan and Ng, 2001b).
 9. Following Porter (1998), clustering refers to the effects generated by the clustering of firms in a location. A cluster is defined as "a geographical proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities. The geographic scope of a cluster can range from a single city or state to a country or even a network of neighboring countries" (Porter, 1998:199).
 10. For detailed discussion, see Ng and Tuan (1997b). The risk premium being cited by business investors was valued at 15 per cent on top of the normal return of investment.
 11. The economic and governmental policies dimension included eight measurements in promoting FDI inflows, and government/government administration has ten measurements (Ng and Tuan, forthcoming). Stability and continuity of economic policy, preferential tax policy provision, and local government FDI policy and its appropriateness were cited by business investors as the top three key measurements affecting their investment decisions. The top three measurements of the government/government administration dimension where the Guangdong government needed to make urgent improvements were its legal system, abuse in fees collection, and government corruption.
 12. According to Tuan and Ng (forthcoming a), the Pyramid Model of City Competitiveness was constructed to explain

the competitiveness or competitive strength of a city. The model depicts three major dimensions in determining city competitiveness: base of economic growth, investment environment and global image.

For discussions of an investment environment in attracting FDI and investment location decisions in Hong Kong, see Ng and Tuan (1997b); and in Guangdong, see Tuan, Ng and Li (1999), Tuan and Ng (2000a), and Ng and Tuan (2001a).

13. Government/government administration, restrictions on business operations, and infrastructural support have, respectively, ten, eight, and four measurements (Ng and Tuan, 2001b).
14. For detailed empirical results and analyses, see Ng and Tuan (2001a).

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