

CHAPTER 6 ECONOMIC IMPACT ASSESSMENT

- 6.1** HKIA serves as much more than just an airport that meets people's travelling needs. It has become an international aviation hub that creates enormous economic value for Hong Kong. Based on a Study by Enright, Scott & Associates (ESA), **the direct, indirect and induced contributions of HKIA to Hong Kong's economy in 2008 accrue to HK\$78 billion⁶⁵ in value added, which is 4.6% of Hong Kong's GDP— provide employment to 185,000 people, about 5.3% of Hong Kong's working population.** As the Hong Kong economy continues to develop and HKIA traffic demand continues to grow, the economic contribution of HKIA will also keep increasing over time. For detailed methodology and assumptions used in the assessment of HKIA's economic contributions, please refer to Appendix 5.
- 6.2** Experience overseas has demonstrated that airports have a significantly higher impact on the local economy⁶⁶ than other transport infrastructure and that investing in them provides very handsome economic returns. ESA has conducted analyses to assess the potential impact of the investments made in HKIA's expansion on Hong Kong's economy.
- 6.3** In general, an investment's economic impact is measured by its direct, indirect, and induced contributions⁶⁷ to the economy, usually expressed in terms of "value added" (VA)⁶⁸ and percentage contribution to GDP in a certain year.
- In the context of HKIA, the terms used above can be elaborated as follows:
- (a) "Direct" contribution refers to employment and income generated by the aviation sector in Hong Kong including the direct operation of the airport, comprising organisations such as the Airport Authority (AAHK), airlines, air cargo terminal operators, catering operators, aircraft maintenance and services operators, etc., as well as non-aviation businesses at HKIA, including retail, food and beverage, hotels, and conventions and exhibitions;
 - (b) "Indirect" contribution refers to employment and income generated by the suppliers of goods and services to the direct activities of the aviation sector in Hong Kong and non-aviation businesses at HKIA, such as utilities suppliers, fuel suppliers, construction and cleaning companies, suppliers of food and retail goods, etc.; and
 - (c) "Induced" contribution refers to the employment and income generated by the spending of income by the direct and indirect employees on local goods and services, such as spending of AAHK employees, airline employees, utilities supplier employees, etc.
- 6.4** In estimating the relevant economic contribution components of airport investment, ESA has quantified both the direct and indirect value added (VA) impact of airport-related

⁶⁵ Throughout this chapter all figures in 2008 are in 2008 HK dollars. Other figures are in 2009 HK dollars unless otherwise stated.

⁶⁶ According to Economic Impacts of Hub Airports, a report commissioned by British Chambers of Commerce in July 2009, the wider economic benefits of hub airports can be 2 to 5 times that of rail.

⁶⁷ Many analyses also include estimates of catalytic benefits such as the impact on tourism, trade, productivity and business environment. The numbers reported in this document do not include such benefits.

⁶⁸ "Value added" is defined as the value of gross output less the value of intermediate consumption (the value of goods and services used up in the course of production) and includes direct, indirect and induced contribution.

activities. ESA has also adopted a set of VA “multipliers”⁶⁹ for selected sectors related to the airport in its calculations and estimated the VA generated from additional spending due to the income projected from the direct and indirect impacts mentioned above.

- 6.5** To ascertain whether investment in HKIA is worthwhile, the study has conducted analyses based on two widely used investment analysis tools: Economic Net Present Value (ENPV)⁷⁰ and Economic Internal Rate of Return (EIRR). However, the two options presented for analysis are widely divergent. One involves leveraging existing assets to serve additional demand, and the other involves heavy investment in building up new assets to serve additional demand. Given the significant difference in investment profiles and the well-recognised shortcoming of EIRR (it tends to favour projects with short-term paybacks at the expense of projects with longer paybacks regardless of the overall value generated by the project), ESA has recommended against conducting investment evaluation based on EIRR and has instead used ENPV.

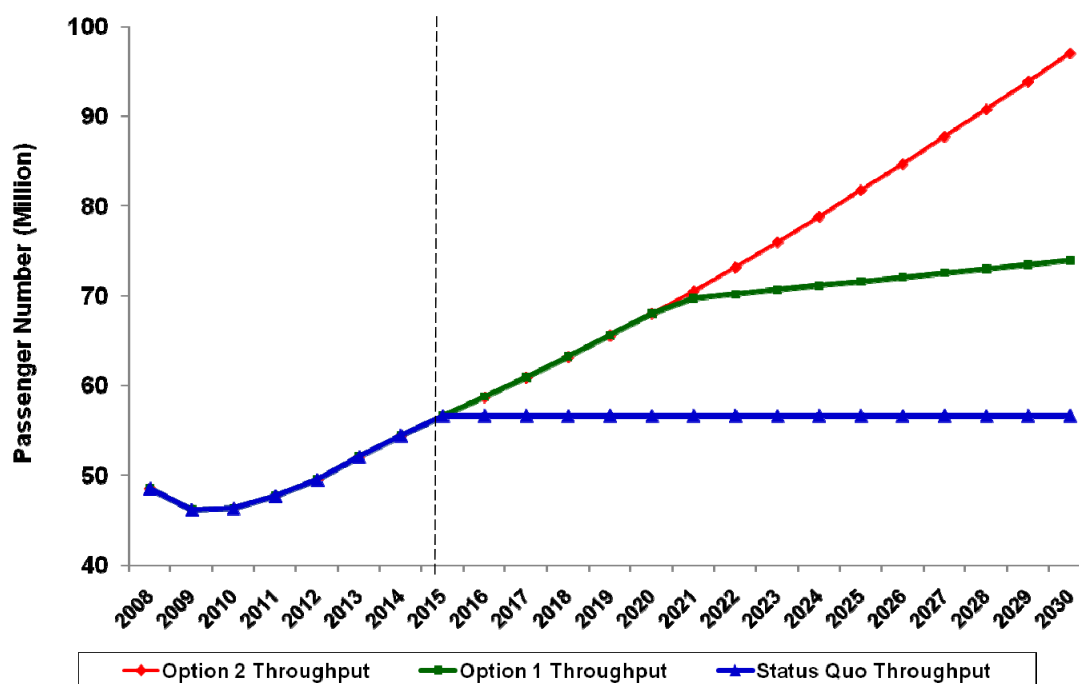
Economic Impact of Option 1 and Option 2

- 6.6** Future projections of the quantifiable economic impact of HKIA were generated for the two main investment options and were referenced to a “Status Quo” benchmark wherein already approved capital investments continue until 2014 but no further investment is made in capacity growth. In “Option 1”, capital investment is made to expand capacity in a two-runway configuration beyond 2015. In “Option 2”, capital investment is made to expand capacity of the two runways and also to construct a new Third Runway, with the first investment being made in 2012. For consistency, the investment evaluation period for both options is 50 years (2012-2061). In order to “stress test” the base analysis, pessimistic cases for Options 1 and 2 were developed by incorporating arbitrary assumptions versus main scenarios of 15% lower demand, 50% higher investment costs, and a declining value added to revenue ratio for aviation businesses.
- 6.7** The traffic forecast assumptions were based on the Master Plan consultant inputs presented in previous chapters of this report. Passenger and cargo throughput figures used for the analyses are illustrated in Figures 6.1 and 6.2.

⁶⁹ The VA multipliers comprise the sectors’ own ability to generate VA and the spillover effect to other sectors. The multipliers relating direct plus indirect value added to gross output or business receipts were provided by the Economic Analysis and Business Facilitation Unit of the Hong Kong SAR Government as broad working assumptions for the current economic impact analysis. These are produced based on the observed linkages between sectors and the resultant pattern of intermediate consumption, import leakages of the various economic activities, gross margin of external trade, the ratios of VA to gross-output and business receipts for the affected sectors in recent years. As these impact estimates are largely judgmental, they should only be taken as working assumptions for the current economic impact analysis, and should not be regarded as “official estimates” of the Government.

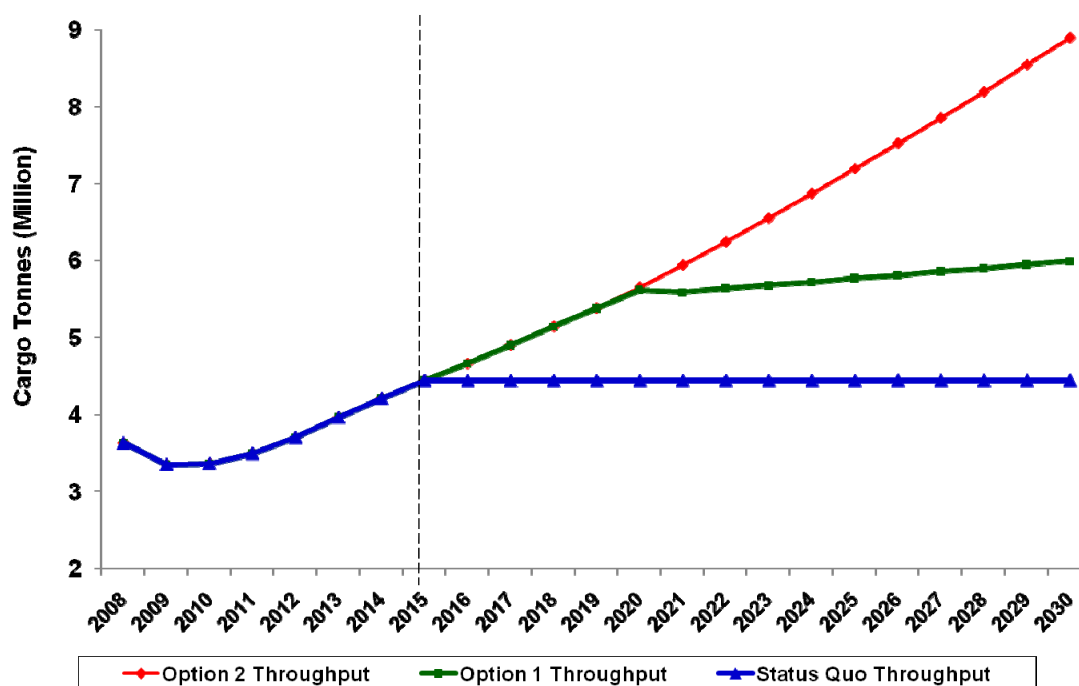
⁷⁰ For details on ENPV projection conducted, please refer to Appendix 6.

Figure 6.1 : HKIA Passenger Throughput



Source: Airport Authority Hong Kong, IATA Consulting

Figure 6.2 : HKIA Cargo Throughput



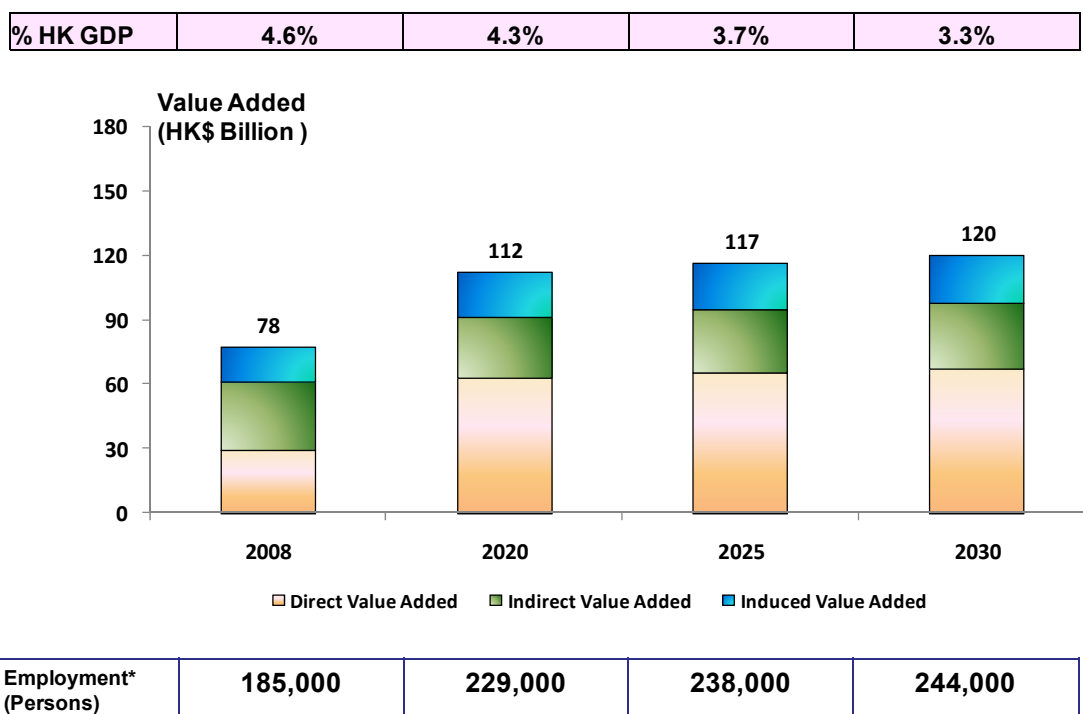
Source: Airport Authority Hong Kong, IATA Consulting

Economic Impact of Option 1 (Two-Runway System)

6.8 ESA estimated that the direct, indirect and induced contribution of HKIA to Hong Kong's GDP in 2030 under this option will be HK\$120 billion, equivalent to around 3.3% of the HKSAR's GDP forecast for 2030 (compared to 4.6% in 2008). Direct employment associated with HKIA would increase from 62,000 in 2008 to 101,000 in 2030. Indirect/induced employment would increase from 124,000 in 2008 to 143,000 in 2030⁷¹ (see Figure 6.3).

6.9 Based on an additional capital investment of HK\$23 billion⁷² under this option, and the corresponding stream of additional traffic up to 2061 (a 50-year life span is assumed for infrastructure), the ENPV⁷³ is estimated to be HK\$432 billion.

Figure 6.3 : HKIA's Economic Contribution under Option 1



Note: *Include estimated direct, indirect and induced employment.

Construction period economic impact excluded.

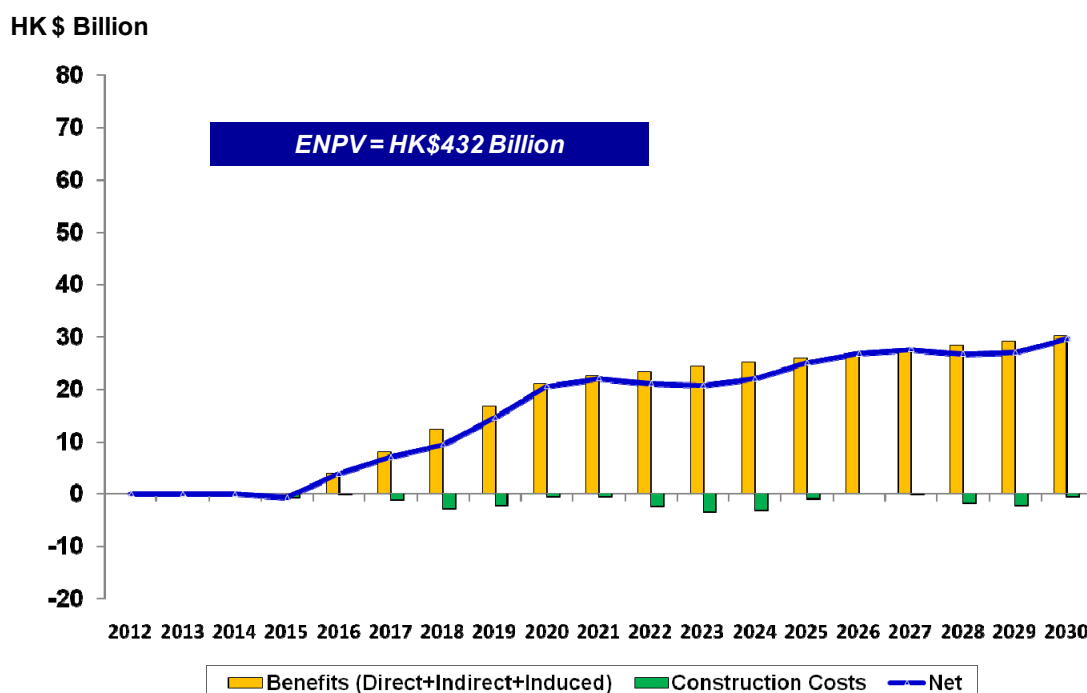
Source: Enright, Scott & Associates Ltd

⁷¹ Figures are rounded.

⁷² Capital investment of HK\$23 billion in 2009 dollars was used in the evaluation of economic impact to align with other information sources.

⁷³ The ENPV was calculated based on a discount rate of 4% for a 50 year return beginning 2012. The 4% discount rate is commonly used to assess the economic benefits of Hong Kong Government funded projects.

Figure 6.4 : Cost and Benefit Flows of Option 1



Note: ENPV is calculated based on 50-year return (till 2061) and discount rate of 4% which is used generally for Government infrastructure projects. Benefits are measured in value added. For simplicity, graph illustrates cash flow up to 2030 only.

Source: Enright, Scott & Associates Ltd

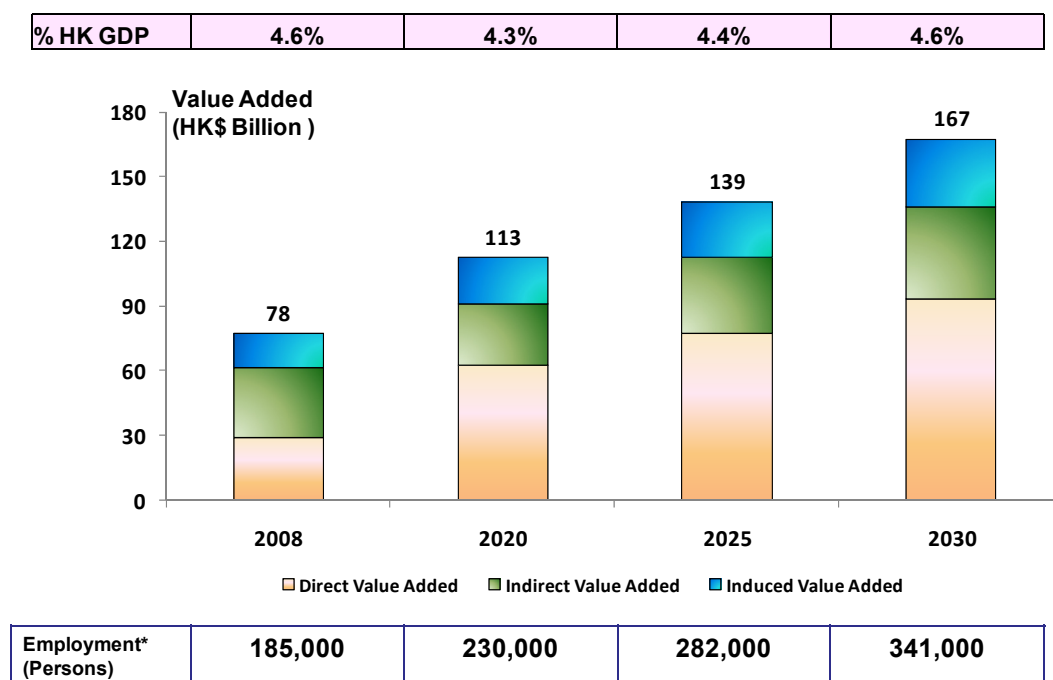
Economic Impact of Option 2 (Three-Runway System)

- 6.10** ESA estimated that with a capital investment of HK\$80 billion⁷⁴ under this option, **the direct, indirect and induced contribution of HKIA to Hong Kong's GDP in 2030 will be HK\$167 billion, equivalent to around 4.6% of the HKSAR's GDP forecast for 2030** (compared to a contribution of HK\$78 billion, 4.6% in 2008). Direct employment associated with HKIA would reach 141,000 and indirect/induced employment would be about 199,000⁷⁵ (see Figure 6.5).

⁷⁴ Capital investment of HK\$80 billion in 2009 dollars was used in the evaluation of economic impact to align with other information sources.

⁷⁵ Figures are rounded

Figure 6.5 : HKIA's Economic Contribution under Option 2

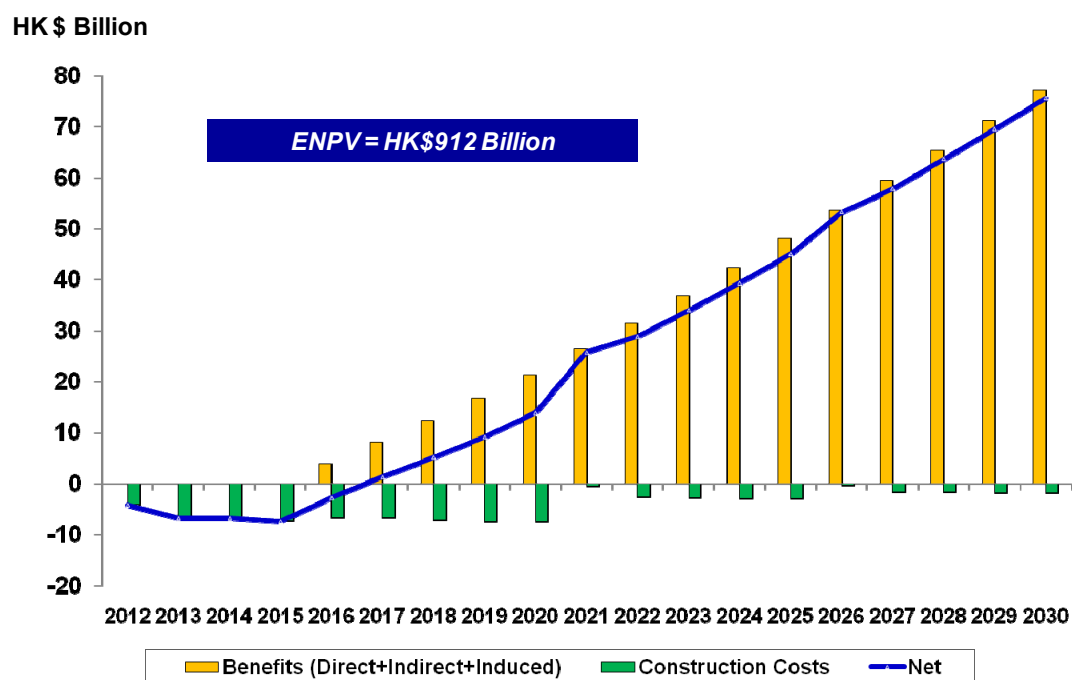


Note: *Include estimated direct, indirect and induced employment. Note: Construction period economic impact excluded.

Source: Enright, Scott & Associates Ltd

6.11 The ENPV up to 2061 under Option 2 is estimated to be HK\$912 billion.

Figure 6.6 : Cost and Benefit Flows of Option 2



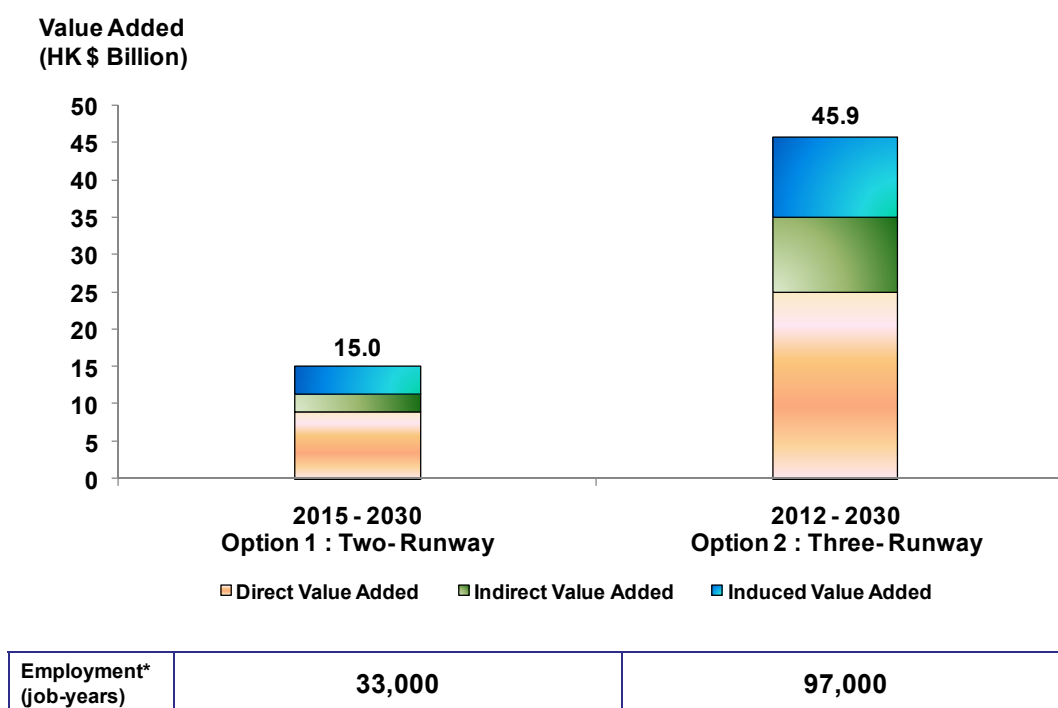
Note: ENPV is calculated based on 50-year return (till 2061) and discount rate of 4% which is used generally for Government infrastructure projects. Benefits are measured in value added. For simplicity, graph illustrates cash flow up to 2030 only.

Source: Enright, Scott & Associates Ltd

Economic Contribution during Construction Period

6.12 ESA estimated that during the construction period for both Options 1 and 2, there will be an economic impact as well as employment generated by the related construction and engineering activities. These impacts have not been factored into the economic benefit calculations (ENPV) in the present Study. The total estimated direct, indirect and induced value added contribution of construction under Option 1 during 2015-2030 is **HK\$15 billion**, with **approximately 33,000 job-years**⁷⁶ generated, mainly related to construction and engineering activities. The total estimated direct, indirect and induced value added contribution of construction under Option 2 during 2012-2030 is **HK\$46 billion**, with **approximately 97,000 job-years** generated, again related mainly to construction and engineering activities.

Figure 6.7 : Estimated Economic Contribution due to Construction at HKIA Options 1 and 2



Note: *Includes estimated direct, indirect and induced employment

Source: Enright, Scott & Associates Ltd

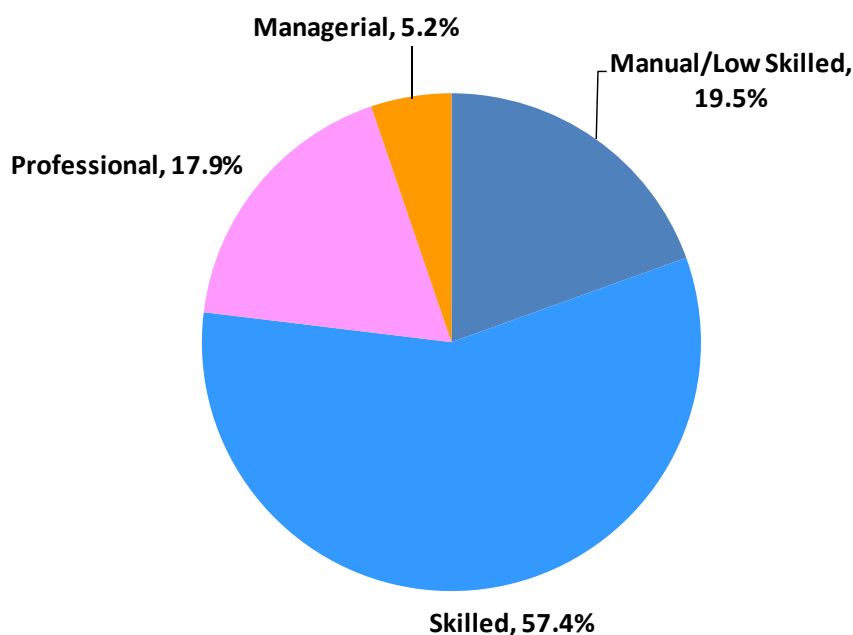
Potential Employment Creation

6.13 Based on ESA's analysis, under Option 1, 244,000 jobs will be generated by HKIA in 2030 whereas under Option 2, the corresponding figure is estimated to be higher at 341,000 (compared with 185,000 in 2008). Excluding indirect/induced employment, **direct employment associated with HKIA in 2030 is estimated to be 101,000 under Option 1 and 141,000 under Option 2** (compared with 62,000 in 2008).

⁷⁶ A "job-year" is defined as one person employed full time for one year.

- 6.14** Further to the ESA Study, AAHK has surveyed nearly 400 different companies and organisations operating on the airport island in 2010. Of the 65,000 people employed, around 20% of the employees perform manual/low-skilled jobs. Returns from the survey indicate an expectation that about 50% of new jobs created under both Options 1 and 2 would be to the manual/low-skilled category. Hong Kong is currently in need of employment opportunities for manual/low-skilled labour and the expansion of HKIA would contribute towards filling this gap.

Figure 6.8 : Airport Island Employment Split in 2010



Source: HKIA Workforce Survey 2010

Definitions: Manual/Low Skilled: Jobs involving simple and routine tasks carried out often with some physical effort and help of hand-held tools. Skilled: Jobs requiring special knowledge and skills acquired through training in order to perform well. Professional: Jobs requiring qualifications and knowledge of a specialised field. Managerial: Jobs which are responsible for the management of a section, department, division or a company in the achievement of organisation objectives.

Hypothetical “Pessimistic” Cases

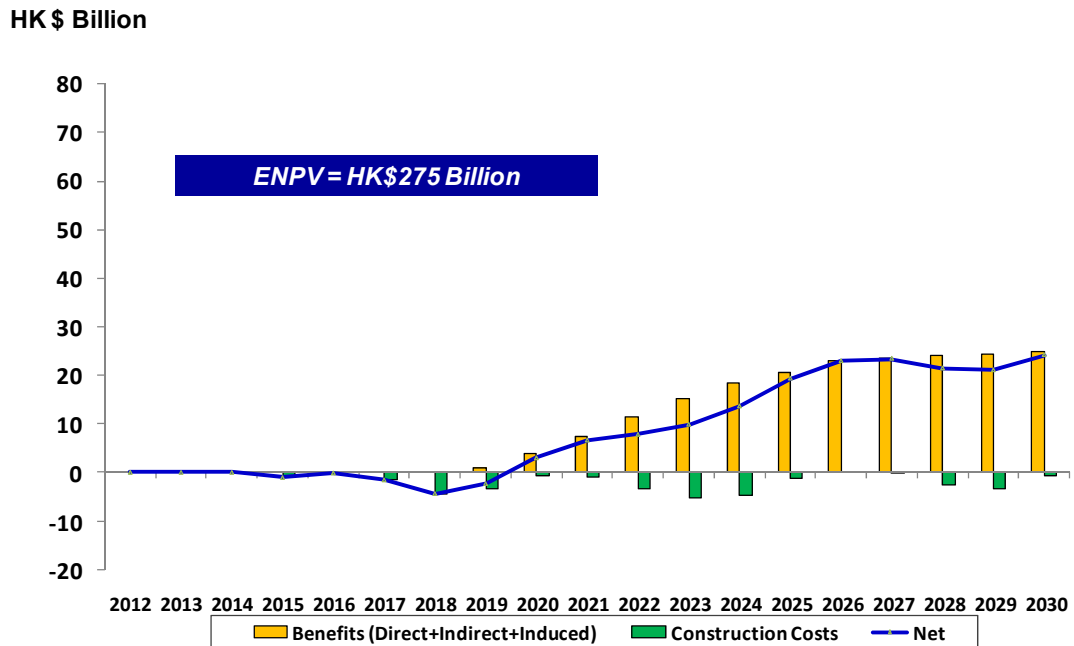
- 6.15** In order to test the robustness of the potential economic return to the airport expansion investments, hypothetical “pessimistic” cases were produced where it was assumed that:
- Demand would be 15% lower than the base case forecast;
 - Construction costs would be 50% higher than the high range cost estimate; and
 - Value-added to revenue ratio in the aviation sector would decline over time instead of remaining constant.

These analyses are merely for stress testing the potential economic returns, and the assumptions used are not based on the recommendations or projections of any independent MP2030 Consultant Studies.

6.16 Option 1 (Two-Runway System)

Based on the Option 1 "Pessimistic" case results, the ENPV up to 2061 is estimated to be HK\$275 billion (see Figure 6.9).

Figure 6.9 : Option 1 Pessimistic Case: ENPV Based on Direct, Indirect and Induced Economic Impacts (Value Added)



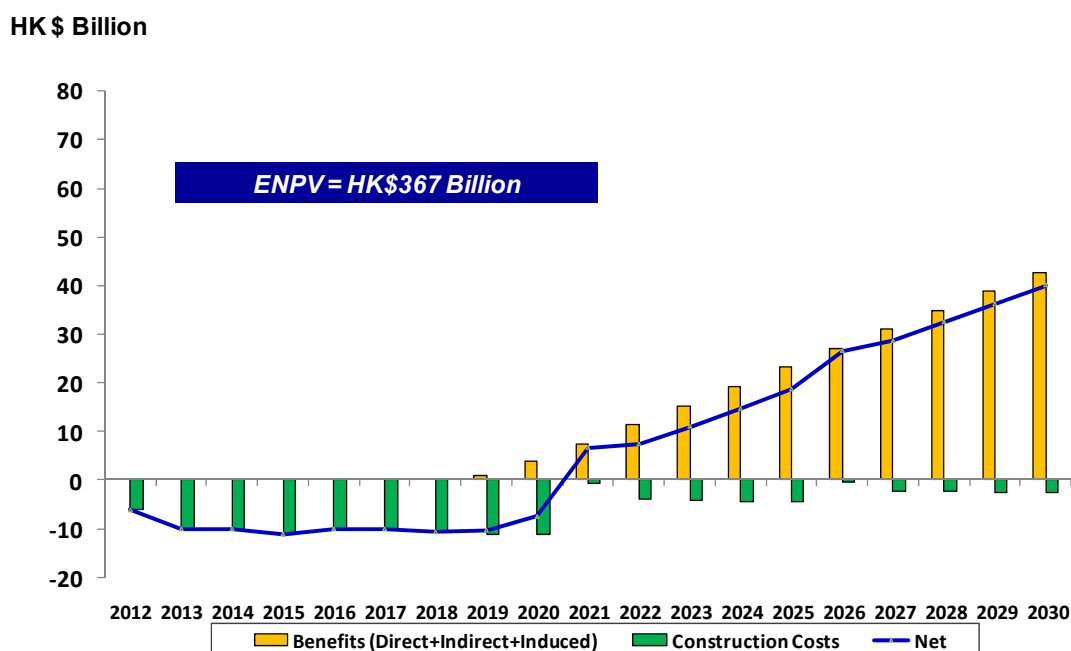
Note: ENPV is calculated based on 50-year return (till 2061) and a discount rate of 4% which is used generally for Government infrastructure projects. Benefits are measured in value added. For simplicity, graph illustrates cash flow up to 2030 only.

Source: Enright, Scott & Associates Ltd

6.17 Option 2 (Three-Runway System)

Based on the Option 2 “Pessimistic” case results, the ENPV up to 2061 is estimated to be HK\$367 billion (see Figure 6.10).

Figure 6.10 : Option 2 Pessimistic Case: ENPV Based on Direct, Indirect and Induced Economic Impacts (Value Added)



Note: ENPV is calculated based on 50-year return (till 2061) and a discount rate of 4% which is used generally for Government infrastructure projects. Benefits are measured in value added. For simplicity, graph illustrates cash flow up to 2030 only.

Source: Enright, Scott & Associates Ltd

- 6.18** The results of the “Pessimistic” stress tests indicate that both Options 1 and 2 would be highly beneficial to Hong Kong, even with pessimistic assumptions on demand and costs.

Summary

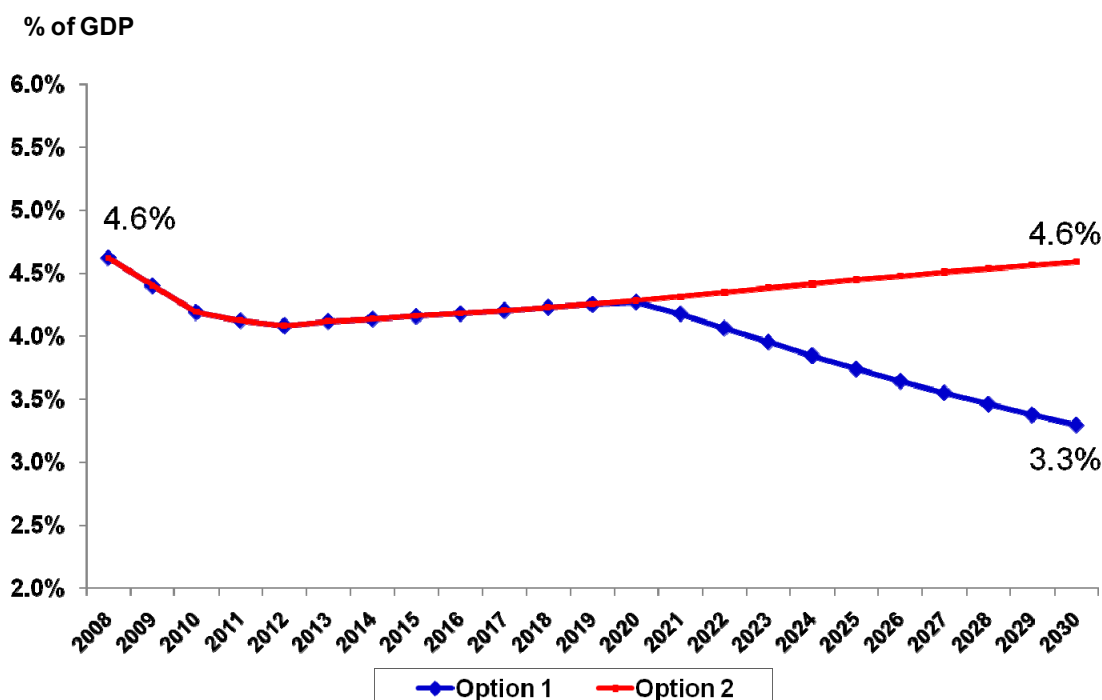
- 6.19** Option 1 is the less costly option in terms of capital investment. An investment of HK\$23 billion⁷⁷ could increase HKIA’s handling capacity by almost 30% resulting in an ENPV of HK\$432 billion. Option 2, however, has a projected ENPV of HK\$912 billion and is a “front-loaded” investment that will generate a much higher value-added ENPV in the long term.

- 6.20** Between the two options, Option 2 brings a substantially higher economic contribution in the long term (a difference of HK\$480 billion in ENPV) and provides a significantly greater boost to local employment. One important aspect of the economic analysis that deserves particular attention is the gradual decrease of HKIA’s economic contribution as

⁷⁷ Capital investment of HK\$23 billion in 2009 dollars was used in the evaluation of economic impact to align with other information sources.

a percentage of Hong Kong's GDP under Option 1 (below the 2008 level) as shown in Figure 6.11. As Hong Kong's economy continues to grow, it is obvious that Option 1 does not allow HKIA to grow in tandem due to its constrained capacity⁷⁸. In addition, constrained capacity is likely to affect connectivity. Experience in Heathrow bears this out clearly: In 1990, Heathrow ranked second among airports in Europe, after Frankfurt, in the number of destinations served, but as its capacity became constrained, it slipped to seventh in 2010 behind Frankfurt, Paris, Amsterdam, Munich, Rome and Madrid⁷⁹.

Figure 6.11 : GDP Contribution Difference – Option 1 versus Option 2



Note: The contribution includes direct, indirect and induced impacts which are measured in value added.
Source: Enright, Scott & Associates Ltd

- 6.21** Hong Kong could be in danger of losing its international aviation hub status should HKIA run out of capacity. The efficient flow of people and goods made possible by HKIA is vital to Hong Kong's role as Asia's financial centre, especially to its four pillar industries – financial services, trading and logistics, tourism, and professional and producer services. These together accounted for approximately 57% of Hong Kong's GDP and 48%⁸⁰ of Hong Kong's employment in 2008.
- 6.22** By 2030, with demand outstripping HKIA's constrained capacity for approximately 10 years, the airport will have been turning away increasing numbers of passengers and cargo due to its fully maximised two-runway system. In this situation, there would be natural tendencies on the part of airlines and cargo carriers to raise prices, promote the operation of larger airplanes, focus on origin-and-destination passengers rather than

⁷⁸ The comparison of the projected economic impact of the two options was made against independently forecast GDP figures. Such figures have not been adjusted to take into account potential slower economic growth in Option 1 than in Option 2.

⁷⁹ "Strategy: Process, Content, Context, An International Perspective By Bob De Wit, Ron Meyer, 4th Edition"

⁸⁰ Based on revised figure released by Census and Statistics Department on 23 Feb 2011.

transfer and transit travellers, focus on major long-haul, regional and the Mainland routes at the expense of other routes, reduce the number of locations with direct services to Hong Kong, and shift freighter traffic to off-peak periods. These natural responses to capacity constraints could negatively impact HKIA's competitiveness and its contribution to Hong Kong's economy.

- 6.23** HKIA could risk losing a significant share of its air cargo and passenger services to other airports if its prices and connectivity fall behind due to capacity constraints. Hong Kong is a global leader in the trade-related services and sourcing sector, whose cornerstone is HKIA. These trade-related services mainly deal with facilitating the supply of consumer products to the world's retailers and industrial products to a wide range of other global businesses. Many retailers consolidate their entire offshore buying activity in Hong Kong because the Mainland is their single largest source of supply, and the remainder of their sourcing from other parts of Asia, South America and Central Europe, is often managed from here as well.
- 6.24** Businesses like trading require excellent connectivity within the Mainland to maintain and develop a large and ever more widely dispersed supplier base across the Mainland. In conjunction they also need excellent connectivity with the other Asian countries that they engage with for sourcing or retailing operations, as well as with their global headquarters. They are thus exceptionally dependent on air travel.
- 6.25** If trading and sourcing activities moved from Hong Kong into the PRD, the loss would ripple through to a range of other industries including financial services, property, trade fairs and exhibitions, freight forwarders (the sales office may be located in Hong Kong to maintain proximity to customers even if the physical logistics are elsewhere), legal services for contract formation and dispute resolution, accounting services, hotels and related services for business travellers engaged in sourcing activities, express carrier services for documents and samples, information technology support services, and other services such as design studios and testing laboratories.