# Asset Service Lives and Depreciation Rates based on Disposal Data in Japan

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## Abstract

This paper estimates the asset service lives and the rates of depreciation based on a finely-defined classification of assets, which distinguishes 369 asset types in total, using data of the retired assets collected in the Survey on Capital Expenditures and Disposals in Japan from 2006 to 2012. This survey collected 838 thousand data of disposed assets from business accounts of private corporations, of which around 60 thousand are sold for continuous use in the production process with positive prices. The disposed assets are classified into five types to more accurately determine the remained values in retired assets. The difference in the definitions of remained values on the retired assets generates a 1.4 percentage point gap in the estimated rate of depreciation for the whole asset stock owned by private corporations, and in turn may have a significant impact on the measurement of capital stock level. The estimated rates of depreciation on average are 20.4% for machinery and equipment and 11.3% for building and construction. Although the high depreciation rates and DBRs estimated in Canada, in particular for building and construction, are not necessarily be treated as standards in the world, our estimates strongly support their high rates of depreciation and high DBRs than the traditional views of the parameters involved in the U.S. NIPA.

## Keywords

Capital measurement; asset service life; depreciation, scrap, renovation

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## 1 Introduction

Estimating retirement patterns, which involves a decision about the service life of different assets and an assumption about the distribution around this service life, is problematic and raises many empirical issues, since the required data are collected only infrequently, if not unavailable. Consequently the variation in asset service lives and retirement patters often appears arbitrary and lacks statistical basis. This is an area of improvement that the Economic and Social Research Institute (ESRI) has managed to make through extended data within its project for a comprehensive revision of capital stock measurement launched in 2005.

The revised stock accounts in Japan's system of national accounts (JSNA) were published as of the beginning of 2012. One of the main improvements in this revision is the newly developed time-series fixed capital formation matrices (FCFM) cross-classified by industry and institutional sector, in an asset classification that is consistent with the most detailed product classification in the product flow data of JSNA. The product flow method is applied in JSNA based on about 2,300 types of products at the most disaggregated level, in order to obtain better estimates of the expenditure measure of GDP. Disaggregating products in the product flow method is a basic strategy to enable us to identify more accurately, under the constraint of limited data availability of the actual product flow, if a product is purchased to be used in production process or consumed by household, and if it is used up within the accounting period. The same strategy may work well in estimating FCFM for some industry-specific assets, to determine the economic activity of asset users. About 500 out of 2,300 products in the product flow data are treated as produced assets in the time-series FCFM.

In measuring capital stock, estimates can be improved by using a more disaggregated and better-defined classification of assets. In line with the international practice, the revised JSNA assumes the geometric approach to approximate the asset-specific rates of depreciation, which are also constant among vintages due to data constraints. A geometric rate of depreciation, whereby the asset depreciates at a constant rate as asset ages, has been empirically verified as an effective approximation in some studies.[1] Whether a constant rate of depreciation among different vintages is an acceptable approach, however, may depend on the degree of aggregation in the asset classification. A higher degree of disaggregation in the asset classification used in the perpetual inventory method (PIM) is expected to improve the stability of depreciation rates among vintages and in turn the validity of PIM as an indirect method to estimate the capital stock.

To further disaggregate produced assets, new attributes are introduced in order to distinguish

[1] The pioneering empirical studies by Hulten and Wykoff (1981a, 1981b, and 1981c) advocated the geometric approach to approximate the age-price profiles (APP) based on the information on market prices of second-hand assets in the U.S. In the revision of wealth accounts in the U.S. National Income and Production Accounts, the geometric approach was accepted as the default by Bureau of Economic Analysis (Fraumeni, 1997; Katz and Herman, 1997). Statistics Canada also assumes a constant geometric rate in Canada's SNA, supported by their comprehensive studies using the large-scale micro database that includes disposal surveys over the period 1985 to 2001. Reflecting these empirical studies, the revised OECD manual on capital measurement recommends the use of the geometric approach since "they tend to be empirically supported, conceptually correct and easy to implement" (OECD, 2009).

what used to be classified as a single product. More specifically, we have chosen in this paper three new dimensions to look at assets, which also provide valuable insights into the behavior of asset disposal, and in turn help refine our understanding of asset retirement patterns. First, a difference in materials or technologies used in assets is considered. Second, some assets are classified by the type of use. A physically unique motor vehicle is used in different production processes, e.g. for own use in corporations, passenger services, freight transportation, rental, demonstration, and so on. Such difference may have a considerable impact in the economic behavior of disposal. Third, the repair and improvement investment is separately identified from the acquisition of the asset itself. In the FCFM, the investment of building consists of new constructions as well as the large-scale repair and improvement of buildings purchased in the past. Not only is the latter expected to be depreciated faster than the building structure itself, it is also expected to rise in significance in the developed economies.

Using the new results of disposal data collected in *Survey on Capital Expenditures and Disposals* (CED) conducted from 2006 to 2012 by ESRI, we estimate the asset service lives and the geometric depreciation rates for 369 types of asset. The disposal survey in CED was designed to provide information to estimate the aging profiles on retirement and price covering a wide range of assets owned by corporations.[2] Similar surveys are conducted in Canada[3] and the Netherlands[4]. In comparison with these surveys, the disposal survey in CED has some unique characteristics. First, it provides more comprehensive information on the characteristics of disposed assets both at their acquisition and at their disposal. In each observation of disposal data, it is identified at its acquisition if it was a new asset, a second-hand asset, or repair and improvement on assets acquired in the past; and at its disposal if a second-hand asset was sold for continued use or scrapped as of the period of disposal. Second, the CED is designed to have a very detailed classification of assets, with more than 600 asset classes at the most disaggregated level for increased homogeneity within each asset type. Third, the periods of acquisition and disposal are reported monthly, enabling us to properly capture the profiles of assets with relatively short services lives.[5]

The disposal survey in CED during 2006–2012 collected about 838 thousand data of disposed assets from business accounts of private corporations, of which about 60 thousand are assets sold for continued use in production process of other producers with positive sales prices. These new data enable us to estimate the Weibull survival profiles for 369 assets and the age-price profiles for 215 assets. In Section 2, we describe some properties of the disposal data from CED and discuss our definitions and treatment of disposed assets, focusing especially on

[2] The questionnaire and the asset classification for CED were designed at the National Wealth Division, ESRI, Cabinet Office in 2006, by Koji Nomura, Yuji Onuki, and Shinichi Shimakita.
[3] See the studies based on this micro database: Gellatly, Tanguay and Yan (2002) and Statistics Canada (2007) prepared by Marc Tanguay, Guy Gellatly and John R. Baldwin.
[4] See Meinen, Verbiest and Wolf (1998), Bergen, Haan, Hij and Horsten (2005), and Erumban (2008).
[5] The questionnaire of *Capital and Repair Expenditures Survey* by Statistics Canada directly investigates age of a disposed asset, rather than periods of disposal and acquisition. Gellatly, Tanguay and Yan (2002) adopted the correction for digit preference in the respondents, since they found a concentration of asset durations on rounding values like 5, 10, 15, and 20 years. The CED does not have such biases.

the remained values of retired assets. The methodological framework to estimate the survival profile based on the Weibull function and the age-price profile is described in Section 3. Section 4 reports the estimated results and Section 5 concludes.

## 2 Disposed Assets – Data and Definitions

The first disposal survey in *Survey on Capital Expenditures and Disposals* (CED) was conducted by ESRI at the end of 2006, collecting data of disposed assets in Japan's fiscal year 2005 (April 2004–March 2005).[6] The CED consists of three questionnaires on capital and repair expenditures, financial leases, and disposals. In the disposal survey of CED, assets are classified into four broad asset groups; they are buildings and accompanying equipment, machinery and equipment, transportation equipment, and other equipment. In each category of assets, fifteen observations of disposed assets that are expected to be randomly selected by corporations are reported, yielding a total of sixty observations of disposed assets covering all four asset groups if a firm fully responds.

The CED has a detailed classification for more than 600 types of assets. This paper defines the asset classification by considering the types of materials, types of use, and if investment was for renovation and improvement; and the minimum number of available observations required to estimate the aging profiles on retirement and price in each asset is set as 20. The defined classification has 95 types of asset at the 3-digit classification and 369 types at the most detailed 6-digit classification. As broad groups of asset type, it is consistent with the 2008 SNA classification. Some detailed tables on the estimates are shown in Appendix 2. The collected data are carefully examined to correct for the misreported units and periods, and the misclassification of assets and categories. Appendix 1 provides the detailed description on the screening processes of the disposal data collected by CED.

**Table 1: Definitions and Treatment of Disposed Assets**

<table>
<tr><th colspan="2" rowspan="2">group of disposal assets</th><th rowspan="2">to whom</th><th rowspan="2">for what</th><th rowspan="2">retired or surviving</th><th colspan="2">values of the asset</th></tr>
<tr><th>definition-1</th><th>definition-2</th></tr>
<tr><td>(1)</td><td rowspan="4">sold (with positive prices)</td><td rowspan="2">to domestic producers</td><td>continuous use in the similar production process</td><td>surviving</td><td colspan="2">market value of surviving asset</td></tr>
<tr><td>(2)</td><td>continuous use in the different production process or household</td><td>retired</td><td rowspan="2">market value of surviving asset</td><td>0</td></tr>
<tr><td>(3)</td><td rowspan="2">to foreign purchasers</td><td>continuous use</td><td>retired</td><td>0</td></tr>
<tr><td></td><td>scrapped</td><td>retired</td><td rowspan="3">scrap value</td><td>0</td></tr>
<tr><td>(4)</td><td>anyone</td><td>scrapped</td><td>retired</td><td>0</td></tr>
<tr><td>(5)</td><td>abandoned</td><td>anyone</td><td>any</td><td>retired</td><td>0</td></tr>
</table>

Table 1 presents our definitions and treatment of disposed assets. The disposed assets collected by the survey are classified into five groups. The first group is recognized as sold to

[6] In this CED, the survey subjects are about 133,000 firms that have a capital of 30 million yen or more, of which the numbers of survey objects and the effective responses are 30,000 (the sampling rate is 22.6 percent) and 12,173 (the response rate is 40.6 percent), respectively.

other domestic producers for continued use in a similar production process. The assets in this group are recognized as surviving assets and are excluded from the sample used in estimating the survival function. The second group also consists of the disposed assets sold to domestic producers, but for a use in different production processes or households. For example, based on the actual disposal data, a considerable number of motor vehicles are deployed as fixed capital for demonstration use in retailer's showroom and they have by nature a very short service life (just over 1 year, as measured later). Figure 1 provides the histogram of the number of collected samples on the service lives of ordinary passenger cars. It describes how the cars with different uses can be mixed in a single asset.[7] Most of them are sold at the second-hand markets with positive prices and subsequently used in a different production process (i.e. passenger or freight transportation) by other producers or households. In this paper, such assets are separately defined and treated as retired assets when they are sold. The third group of disposed assets is to be exported (for scraps or uses in production process in foreign countries) and hence recognized as assets retired from domestic production.[8] The fourth group consists of assets to be scrapped with positive prices and the fifth assets that are simply abandoned. Both are obviously recognized as retired assets.

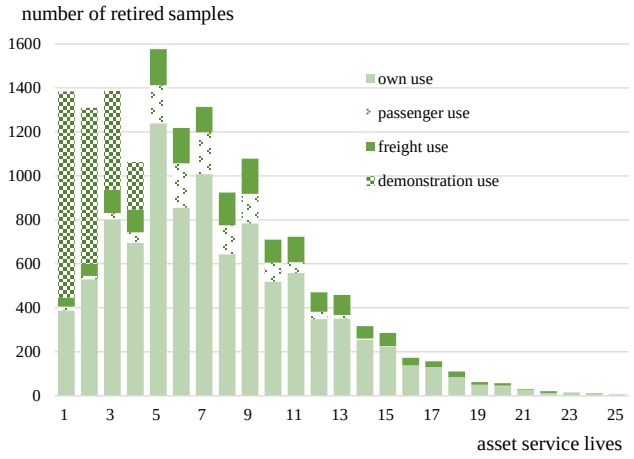


**Figure 1: Histogram of Service Lives of Ordinary Passenger Cars**

In estimating the age-price profiles (APP), properly identifying retired assets does not resolve all the issues; how the values of retired assets are measured can be more controversial.[9] As shown in Table 1, it is possible to estimate APP based on two different definitions of the

[7] The vehicles disposed by car retailers consists of cars for demonstration use and their own business use, which are not necessarily identified. Based on the asset explanation reported in the questionnaire, most of demonstrator cars when they were clarified were disposed within four ages. In this paper, we defined the demonstrator cars as the cars disposed from the car retailers within four years old.

[8] In the case of airplanes, all disposed assets collected in the survey are sold to domestic or foreign producers. Airplanes can have a very long service life if they are appropriately maintained, but they can also be retired prematurely for economic reasons. We treat all disposed airplanes as retired assets.

[9] This point was highlighted through the author's communication with Professor Erwin Diewert (University of British Columbia).

values of retired assets. In definition-1, the values of retired assets are assumed to be the same as the scrap values or the values sold at the second-hand markets regardless of the differences in the subsequent use of the assets. Some of retired assets still have market values in a different production process (the second group of disposed assets in Table 1), in foreign countries (the third group), or as scrap (the fourth group). It seems economically reasonable to assume that assets are retired when the net value stemming from the future capital services drops below the value received from the market.

In definition-2, on the other hand, the values of retired assets are assumed to be zero. It seems reasonable to consider that a demonstrator car in retailer's showroom was retired not because it could be sold with a good price at the second-hand markets, but because it has lost its net value of future capital services as a demonstrator car after it has aged for a few years. This situation is the same in scraps in nature. For the cases that the assets are sold as scraps with considerably positive prices, it is obvious that the scrap values do not lie in the future capital services of the assets, which can only generate a capital value as a factor of production when the assets keep intact as a functioning unit work. In addition, it may cost firms to know the scrap value of each asset. In a firm's actual retirement decision, producers may carefully compare the productivity of newly available assets against the present and future operating costs of their existing assets, rather than their scrap values. We prefer definition-2 for constructing the productivity accounts in JSNA, but to avoid making an a priori judgment over the two definitions, we estimate both sets of results.

**Table 2: Number of Observations in the Sample of Disposal Data**

| 1st-digit classification of asset | SNA 2008 code | New assets as of the period of acquisition | | | Second-hand assets as of the period of acquisition | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | a) retired | b) sold | c) total | d) retired | e) sold | f) total | g) retired | h) sold | i) total |
| 1.Dwellings | AN111 | 3,728 | 1,458 | 5,186 | 592 | 621 | 1,213 | 4,320 | 2,079 | 6,399 |
| 2.Buildings other than dwellings | AN1121 | 41,158 | 3,098 | 44,256 | 2,623 | 645 | 3,268 | 43,781 | 3,743 | 47,524 |
| 3.Other structures | AN1122 | 39,808 | 1,532 | 41,340 | 1,697 | 139 | 1,836 | 41,505 | 1,671 | 43,176 |
| 4.Installation of equipment | - | 86,236 | 3,197 | 89,433 | 2,389 | 260 | 2,649 | 88,625 | 3,457 | 92,082 |
| 5.Transport equipment | AN1131 | 67,497 | 23,146 | 90,643 | 10,823 | 5,089 | 15,912 | 78,320 | 28,235 | 106,555 |
| 6.ICT equipment | AN1132 | 117,358 | 3,092 | 120,450 | 2,551 | 102 | 2,653 | 119,909 | 3,194 | 123,103 |
| 7.Other machinery and equipment | AN1133 | 376,323 | 24,322 | 400,645 | 14,967 | 2,376 | 17,343 | 391,290 | 26,698 | 417,988 |
| 8.Costs of ownership transfer | AN116 | 541 | 34 | 575 | 33 | 7 | 40 | 574 | 41 | 615 |
| 9.Software | AN11731 | 151 | 9 | 160 | 7 | 2 | 9 | 158 | 11 | 169 |
| Total | | 732,800 | 59,888 | 792,688 | 35,682 | 9,241 | 44,923 | 768,482 | 69,129 | 837,611 |

Unit: number of samples. Source: Survey on Capital Expenditures and Disposals, 2006–2012, (ESRI, Japan)

Table 2 lays out the sample size of each asset type collected by the disposal survey in CED during 2006–2012 at 1-digit asset classification. Out of the full sample of disposed assets (837,611 observations in all), 92% (or 768,482 observations) are recognized as retired assets by the definitions in Table 1, of which 732,800 assets were acquired as new and 35,682 assets second-hand . In estimating the survival profiles, we restrict our sample to the former of 732,800 observations of disposed assets acquired as new by the owners of the current period, of which the asset service lives can be properly defined. In estimating APP, we use 59,888 observations of the sold assets with positive prices.

## 3 Methodology

We follow the theory and models on vintage prices in Jorgenson (1973, 1989), Hulten and Wykoff (1981a, 1981b, and 1981c), and Diewert and Wykoff (2007). Let us start with measuring the survival profile and the average years of asset service lives. A number of empirical studies on the survival function of produced assets have assumed the Weibull family of distributions to approximate retirement patterns.[10] The Weibull survival profile with age $\tau$ is formulated as:

(1) $s_\tau = \mathrm{EXP}[-(\tau/\lambda)^\alpha]$,

where $\lambda$ and $\alpha$ are the scale and shape parameters, respectively (both are greater than 0).[11] We approximate the actual survival probability using the asset service ages of the retired assets as defined in Table 1, weighted by the acquisition costs as proxies for the quantities of the retired assets. The survival function using the samples collected by a disposal survey can be biased since the samples may not reflect the actual investment patterns. The use of pooled data of the disposed assets collected in different years during 2006–2012 is expected to reduce these biases. For the assets which have long service lives we adjust the acquisition costs by multiplying the inverse of the volume index of investment to ease such biases.[12]

Taking logarithm of the Weibull cumulative hazard function ($H_n$), we can obtain a log-linear relationship with age as follows:

(2) $\ln H_\tau = \beta + \alpha \ln \tau$,

where $\beta = -\alpha \ln \lambda$. The two parameters $\alpha$ and $\beta$ are estimated for 369 types of asset. The 1st moment of the Weibull probability density function gives the average asset service life ($T$):

(3) $T = \lambda \Gamma(1 + 1/\alpha)$,

where $\Gamma(\ )$ is the gamma function.

To estimate APP, we begin with the definitions of two types of prices to be observed in disposal survey. When $i$ observations ($i$=1,2,…,N) are available for a single asset to be sold for continuous use in production process, scraps, or exports, we express the value received by seller of the asset with age ($\tau$) as of the period of disposal (t) and the corresponding acquisition cost (gross book value) paid by the purchaser of the new asset as of the past period of $(t-\tau)$ as $D^t_{\tau,i}$ and $A^{t-\tau}_{0,i}$, respectively. Both are evaluated at historical costs.

To make two values comparable, $D^t_{\tau,i}$ and $A^{t-\tau}_i$ are converted to

(4) $V_{\tau,i} = D^t_{\tau,i}(1+m^t)/P^t_0$,

and

(5) $V_{0,i} = A^{t-\tau}_{0,i}/(1+\pi^{t-\tau})/P^{t-\tau}_0$,

where $P^t_0$ stands for the price index for acquisition of a new asset (with 0-age). The value received by the seller is converted to the price paid by the purchaser using the average rate of

[10] See Meinen, et al (1998), Nomura (2005), Erumban (2008), and Statistics Canada (2008).

[11] The Weibull distribution is more flexible than the exponential distribution, since it is the exponential distribution of the power transformed age: $(\lambda)^\alpha$. In the special case of $\alpha$=1, the Weibull distribution is identical with the exponential distribution, which has the constant rate of retirement.

[12] The volume index of investment (normalized as 1.0 in 2010) is defined by the investment at constant prices in each type of asset. The lower bound in the volume index is set as 0.5 for all assets, thus the acquisition costs as the sample weights are adjusted to be doubled at most.

wholesale margin and transportation cost ($m^t$) and the acquisition cost paid by the purchaser is converted to the price excluding any acquisition taxes for this asset ($\pi^{t-\tau}$) if they were included.[13] Using these two prices, the age-price ratios of surviving assets are defined as

(6) $\rho_{\tau,i} = V_{\tau,i}/V_{0,i}$.

In defining APP, definition-1 in Table 1 assumes that the values of retired assets are identical with the market values as scraps or second-hand assets. In this approach, the age-price ratio of the whole assets $\rho_{\tau,i}^{*1}$ is assumed as a weighted average of the values of surviving assets and retired assets:

(7) $\rho_{\tau,i}^{*1} = s_\tau \rho_{\tau,i} + (1 - s_\tau)\theta$,

where $\theta$ represents the average market values of the retired assets. A number of studies have assumed the scrap values are zero, due to the lack of information on net scrap value (gross scrap value less demolition costs) even though Hulten and Wykoff (1981b) recommended to include it in measuring APP. Using the disposal data, we estimate the average scrap values as:

(8) $\theta = \sum_i V_{\tau,i}/\sum_i V_{0,i}$,

where $i$ are defined as the observations in the sample of retired assets aged over the average asset service lives ($T$) in equation (3) in each type of asset.[14] There are however exceptions. For airplane, all sold assets are assumed to be exported, and are thus recognized as retired from the domestic economy by our definition. For demonstrator motor vehicles, they are also recognized as retired from the original production process. We assume the market values for these retired assets ($\theta$) are the observed values at the second-hand markets.

Definition-2 in Table 1 assumes zero values of retired asset. In this approach, the age-price ratio of the whole assets $\rho_{\tau,i}^{*2}$ is assumed as:

(9) $\rho_{\tau,i}^{*2} = s_\tau \rho_{\tau,i}$.

Using three definitions of age-price ratios, namely $\rho_{\tau,i}$ (for surviving assets), $\rho_{\tau,i}^{*1}$ (for the whole assets in definition-1), and $\rho_{\tau,i}^{*2}$ (for the whole assets in definition-2), APP are estimated for 215 types of assets. We assume APP follows the time-invariant geometric function. Taking logarithm of APP, this equation is estimated:

(10) $\ln \rho_\tau^* = \gamma\tau$,

based on the weighted least squares method using the acquisition costs at constant prices in equation (5).[15] A constant rate of depreciation $\delta$ is obtained as

(11) $\delta = 1 - \mathrm{EXP}(\gamma)$.

## 4 Results

### 4.1 Asset Service Lives

Figure 2 shows the estimated results of the shape parameter ($\alpha$) and the average asset

[13] The rates of margin and transportation are based on the 2005 Benchmark Input-Output Table in Japan. An average rate for machinery and equipment is 26.3% for trade and 1.9% for transportation.

[14] We assumed that the scrap value to the acquisition cost at constant prices does not exceed 10% in each asset.

[15] Although our data identifies the sold assets (the sold assets as scraps are expected to be classified as retired assets), some scraps may be included in the sold assets for continuous use in domestic production process. By considering this, we used the samples of which age-price ratios are between in 0.1–1.0 of the acquisition costs to estimate APP.

service lives ($T$), for 369 types of assets. The details in the estimated Weibull retirement profiles are presented in Table 9 in Appendix 2. The estimated service lives of the retired assets owned by corporations range from 1.1 year (88.light passenger cars for demonstration use) to 37.2 years (13.plants-wooden) and 70% out of the 369 assets has an average service life between 10 to 20 years, 16% over 20 years and 16% has below 10 years. The Weibull shape parameter ($\alpha$) determines the hazard rates of assets. In the special case of $\alpha = 1$, the Weibull distribution is identical with the exponential distribution that has a constant hazard rate (and a constant rate of retirement). In the case of $\alpha = 2$, the hazard rate increases linearly. In the Netherlands, Meinen, Verbiest, and Wolf (1998) indicates that the estimated hazard rates tend to be regressively increasing $(1 < \alpha < 2)$ in many assets, except in computers, which have a progressively increasing hazard rate ($2 < \alpha$). Our results show 25% of the 369 assets have progressively increasing hazard rates. Motor vehicles – 101.motor coaches for passenger use (3.9), 93.ordinary passenger cars for passenger use (3.2), 102.mini-sized pick truck for own use (3.0), and computers – 153.word processors (2.9), 124.personal computers (2.6), 125.work stations (2.5), 150.copy machines (2.4), tend to have $\alpha$ that is greater than 2. An institutional factor like the automobile inspection or speed of technological changes may be reflected in the shape parameters and affect the retirement behavior.[16]

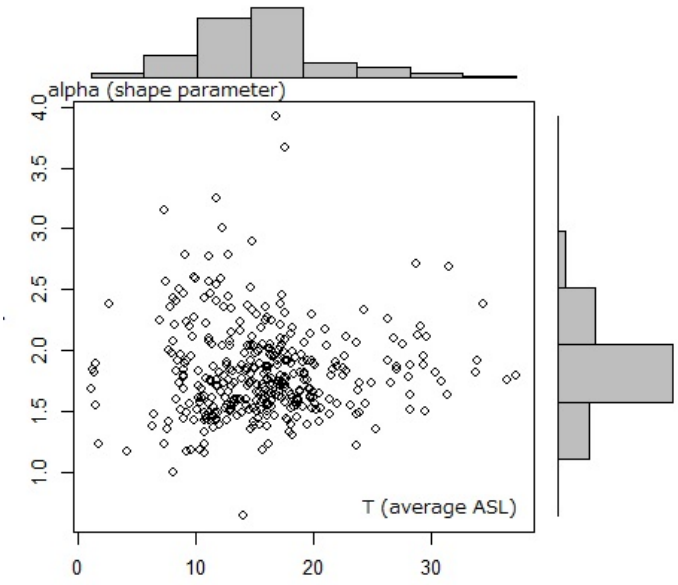


**Figure 2: Estimated Parameters of Retirement Profiles**

[16] Nomura (2005) found that almost half of the assets have a shape parameter greater than 2, based on 66 types of asset classifications and the single-year disposal data. Nomura and Momose (2008) also indicates that 41% of the assets (80 assets) have progressively increasing hazard rates, based on 195 assets. The disaggregation in asset classification and the use of seven-year pooled data might improve the estimates of the parameters and the asset service lives in this paper.

Table 8 presents a summary of the average service lives (*T*) based on 96 asset classifications, aggregated from the estimates for the 369 types of asset using the stock adjusted weights.[17] Table 3 compares results of this paper with the estimates by our first study at ESRI (Nomura and Momose 2008), which uses the disposal data in 2006–2007 CED based on a 195 asset classification, and by Statistics Canada (2007) and U.S. BEA (2003). In comparison with our previous work, the average service lives are somewhat downwardly revised in A-5.hotels, stores, and restaurants, A-6.other buildings, and B-3.transport equipment, mainly because this study newly includes the renovation-type assets which have shorter service lives.[18] The downward revision at the aggregate level also originates from the difference in the weights used to aggregate estimates (the total acquisition costs collected from CED were tentatively used as the weights in our earlier study), and from the further disaggregation of assets in this study from 195 to 369 classes. In addition, the observations of disposed assets could increase by 4 times (from 182,481 to 732,800), that expects to improve to ease the sample bias.

**Table 3: Comparison of Estimated Asset Service Lives**

| | This study | NM (2008) | Canada (2007) | U.S. (2003) |
|---|---|---|---|---|
| A. Building and construction (B&C) | 22.6 | 28.5 | 27.2 | 38.7 |
| A-1. Dwellings owned by firms | 32.9 | 32.9 | | |
| A-2. Plants for manufacturing | 27.4 | 31.0 | 29.2 | 31.0 |
| A-3. Warehouses | 26.7 | 27.4 | 32.1 | 40.0 |
| A-4. Office buildings | 26.5 | 31.7 | 34.2 | 36.0 |
| A-5. Hotels, stores and restaurants | 18.3 | 24.2 | 16.1 | 32.8 |
| A-6. Other buildings | 19.7 | 25.6 | 24.3 | 45.6 |
| A-7. Electric power plants | 23.2 | 23.5 | 25.4 | 45.0 |
| A-8. Water suppy and sewage facilities | 23.0 | 23.9 | | 40.0 |
| A-9. Communication and broadcasting facilities | 13.9 | 13.3 | 20.8 | 40.0 |
| A-10. Other construction | 21.4 | 20.8 | 31.8 | 38.3 |
| B. Machinery and equipment (M&E) | 13.4 | 16.3 | 14.1 | 13.5 |
| B-1. Buildings accompanying facilities | 14.0 | 15.9 | | |
| B-2. Machinery | 17.2 | 17.4 | 14.1 | 15.3 |
| B-3. Transport equipment | 11.5 | 17.0 | 17.6 | 18.5 |
| (of which, motor vehicle) | 10.0 | 12.9 | 11.0 | 9.0 |
| B-4. Other machinery and equipment | 12.3 | 11.6 | 13.5 | 11.2 |
| (regrouped) Computers and copy machines | 8.0 | 7.6 | 4.7 | 7.0 |
| (regrouped) Communications equipment | 11.9 | 9.4 | 9.5 | 11.0 |

Notes: Basically the ASL of the assets owned by private corporations are compared. Estimates for Canada and the U.S. defined as are the simple arithmetic means from the estimates (Statistics Canada 2007, BEA 2003). Estimates for Japan (this study) is the weighted average from the estimated ASLs, using the weights of estimated capital stock at present. Japan (NM2008) is the weighted average, using the accumulated values of disposed assets in CED 2006–07.

Although international comparison of asset service lives is never precise due to the

[17] For aggregating the estimates, the weights are based on the estimated capital stocks owned by corporations in JSNA. For the details which are not available in JSNA stock estimates, the total acquisition costs collected from CED was used to divide the stock estimates to correspond to our asset classification.

[18] In 369 assets, 11 types of renovations in building and construction and 5 types of large improvement in transportation equipment (79.ships, 83.airplanes, 85.railcar, 97.bus and truck, and 116. Industrial trailers) are separately defined. Other renovation and large improvement assets are included in each asset, since a significant differences in the ASL estimates between asset itself and its renovation is not observed. The service lives of renovation assets were not reflected in the estimates of Nomura and Momose (2008).

differences in classification and coverage, the average ASL estimate for machinery and equipment are quite similar in three countries (14.1 for Canada, 15.0 for the U.S. and 13.4 for Japan). A significant difference is found in building and construction. Canada has a shorter service lives by 10.5 years in comparison with the U.S. The Canadian estimates on building and construction are low by the traditional view of the international level of ASL, but Japan's estimate has a further shorter service life than Canada by 4.6 years. The gaps between Canada-Japan and the U.S. will emerge more clearly in the depreciation rates and the DBRs. We will revisit this later.

In computers, Japan has a relatively longer service life of 8.0 years on overage, although the differences in the observation periods should be in mind (e.g. the timing of a new operating system may stimulate to replace old computes). Based on the observations of the computers retired from 2006 to 2012, the computer peripheral equipment has longer service lives, computers itself have 7-9 years of service lives: 7.4 years for 124.personal computer, 8.6 years for 125.workstations, 7.8 years for 126.Midrange computers, and 8.1 years for 127.Mainframe computers, as presented in Table 9. Figure 2 shows the histograms of the number of observations in each asset service lives of retired computes. In all types of computers, the mode is 7 years and considerable number of computes were used beyond 10 years, especially in manufacturing sectors.

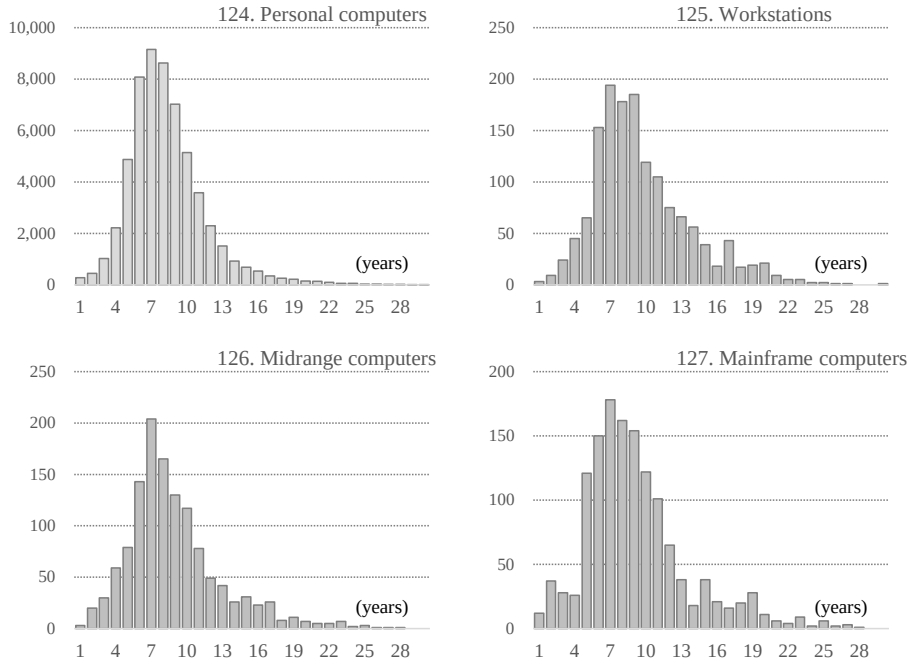


**Figure 3: Histograms of the Number of Observations in Four Types of Computers**

### 4.2 Rate of Depreciation and DBR

Using the sold assets for continuous use in the domestic production process, the geometric rates of depreciation ($\delta$) are estimated for 215 types of assets at the 6-digit asset classification, in which APP is estimated using the age-price ratios including scrap values of retired assets $\rho_{\tau,i}^{*1}$ (definition-1) in equation (7) and the age-price ratios assuming no values for retired assets $\rho_{\tau,i}^{*2}$ (definition 2) in equation (8). For assets where the sample size of assets sold for continuous use in the domestic production is too small, $\delta$ is estimated by $\mathrm{DBR}/T$ using the estimated average asset service lives ($T$) and the assumed declining balance rates (DBR), that are approximated by the estimates at the aggregated level of 3-digit classification of assets.

Motor vehicles for demonstration use (in the second group of disposed assets in Table 1) and airplanes sold to foreign countries (in the third group in Table 1) are treated in different ways. In definition-1, in which the market values of retired assets are reflected, APP are estimated using the age-price ratios of surviving assets evaluated at the second-hand markets of the same type of assets.[21] In definition-2, in which the market values of retired assets are assumed to be zero, the values of surviving assets are assumed to be geometrically depreciated.[22] The detailed table on the estimated results is given in Table 9 in Appendix 2.

**Table 4: Comparisons of Estimated Rates of Depreciation and DBR**

| | Japan (this study) | | | Japan (2008) | Canada (2007) | | U.S. (2003) | |
|---|---|---|---|---|---|---|---|---|
| | (definition-1) | (definition-2) | (DBR) | NM (2008) | | (DBR) | | (DBR) |
| A. Building and construction | 0.102 | 0.113 | 2.54 | 0.109 | 0.083 | 2.26 | 0.025 | 0.97 |
| A-1. Dwellings owned by firms | 0.077 | 0.080 | 2.62 | 0.101 | | | | |
| A-2. Plants for manufacturing | 0.079 | 0.083 | 2.28 | 0.107 | 0.090 | 2.63 | 0.030 | 0.93 |
| A-3. Warehouses | 0.083 | 0.087 | 2.34 | 0.090 | 0.075 | 2.40 | 0.022 | 0.89 |
| A-4. Office buildings | 0.082 | 0.087 | 2.30 | 0.103 | 0.070 | 2.39 | 0.025 | 0.89 |
| A-5. Hotels, stores and restaurants | 0.100 | 0.113 | 2.08 | 0.111 | 0.100 | 1.61 | 0.028 | 0.92 |
| A-6. Other buildings | 0.097 | 0.108 | 2.13 | 0.122 | 0.070 | 1.70 | 0.020 | 0.91 |
| A-7. Electric power plants | 0.088 | 0.093 | 2.16 | 0.122 | 0.090 | 2.29 | 0.021 | 0.95 |
| A-8. Water suppy and sewage facilities | 0.090 | 0.095 | 2.19 | 0.133 | | | | |
| A-9. Communication and broadcasting facilities | 0.107 | 0.148 | 2.05 | 0.104 | 0.120 | 2.50 | 0.024 | 0.95 |
| A-10. Other construction | 0.127 | 0.135 | 2.88 | 0.146 | 0.130 | 4.13 | 0.023 | 0.90 |
| B. Machinery and Equipment | 0.186 | 0.204 | 2.75 | 0.195 | 0.200 | 2.82 | 0.180 | 2.43 |
| B-1. Buildings accompanying facilities | 0.148 | 0.164 | 2.30 | 0.138 | | | | |
| B-2. Machinery | 0.161 | 0.168 | 2.90 | 0.182 | 0.148 | 2.09 | 0.155 | 2.38 |
| B-3. Transport equipment | 0.208 | 0.244 | 2.80 | 0.222 | 0.193 | 3.40 | 0.170 | 3.15 |
| B-4. Other machinery and equipment | 0.211 | 0.230 | 2.84 | 0.243 | 0.194 | 2.62 | 0.168 | 1.88 |
| (regrouped) Computers and copy machines | 0.260 | 0.298 | 2.38 | 0.363 | 0.450 | | 0.312 | |
| (regrouped) Communications equipment | 0.254 | 0.265 | 3.15 | 0.313 | 0.230 | | 0.150 | |

Notes: The average rates of depreciation of the assets owned by private corporations are compared. Estimates for Japan (this study) is the weighted average from the estimated rates, using the weights of estimated capital stock at present. Japan (NM2008) is the weighted average, using the accumulated values of disposed assets in CED 2006–07. The estimates in Canada are defined as simple averages of their ex post estimates across assets in Statistics Canada (2007).

A summary of our estimates for the rates of depreciation is presented in Table 4, against those for Canada reported in Statistics Canada (2007) and the U.S. reported in BEA (2003). The

[21] Demonstrator cars and airplanes are treated as fully maintained during their service lives until they are sold (recognized as retirement) and that they have the values over the second-hand market values at least, regardless if they are surviving or sold (retired).

[22] Since the data of surviving assets to estimate APP for demonstrator cars and airplanes are not available by definition (all of the sold assets are defined as retired assets, as shown in Table 1), the geometric depreciation profile is assumed a priori. The rates of depreciation are computed to satisfy $0.1 = (1-\delta)^T$, which means that 10% of the value remains as of the period of the estimated $T$.

estimates excluding scrap values in definition-2 are comparable with both countries' estimates.[23] Japan's average rates of depreciation are 11.3% for buildings and construction and 20.4% for machinery and equipment. For machinery and equipment, our estimates are quite similar to those for Canada and slightly higher than the U.S. estimates. This order in the magnitude of depreciation rates among three countries are sustained in four types of machinery and equipment, except computers. Reflecting the average service life of 4.7 years (Table 3), the rate of depreciation for computers is 45.0% in Canada, although the rates are quite similar in the U.S. and Japan (31.2% and 29.8%, respectively). In buildings and construction, however, Japan's rate of depreciation is higher by 3.0 percentage points than the Canadian average and more than three times higher than the U.S. average.

Statistics Canada (2007) indicates that the estimates on depreciation rates based on their large-scale micro database are quite similar to the U.S. estimates for the machinery and equipment asset classes on average: the U.S. average is 18% compared with the Canadian rate of 20%. In contrast, they found a considerable difference for buildings and construction: the U.S. average is 3% whereas the Canadian average is 8%. They attribute these differences mainly to the very low DBRs that are used in the U.S. estimates. Their results show that the DBRs for these long-lived assets (2.26 in Table 4) are much higher than those derived from the historical U.S. studies, in which BEA assumes 0.97 for private nonresidential structures.

Our estimates support this view. Figure 4 presents the estimates for depreciation rates and DBRs (definition-2) by 215 types of assets. Most of the estimated DBRs ranges from 2.0 to 3.5 (33.5%, 36.7%, and 14.4% of the DBRs are in regions of 2.0–2.5, 2.5–3.0, and 3.0–3.5 respectively). Only a small number of assets with specific purposes (such as motor vehicles for demonstration use) has around 1.0 DBRs with high depreciation rates. On building and construction, the assets with DBRs that is smaller than 2.0 account only eight out of 40 types of assets: 43.model home (1.64), 32.stores (SRC) (1.77), 39.restaurants (1.78). The weighted average of DBRs is estimated as 2.54 for building and construction and 2.78 for machinery and equipment, as shown in Table 4. Even in building and construction, this result justifies accelerating depreciation in the early ages of the asset.

[23] In comparison with Nomura and Momose (2008), which considered the scrap values in the APP, the estimated depreciation rates in this study are downwardly revised, from 10.9% to 10.2% in building and construction and from 19.5% to 18.7% in machinery and equipment.

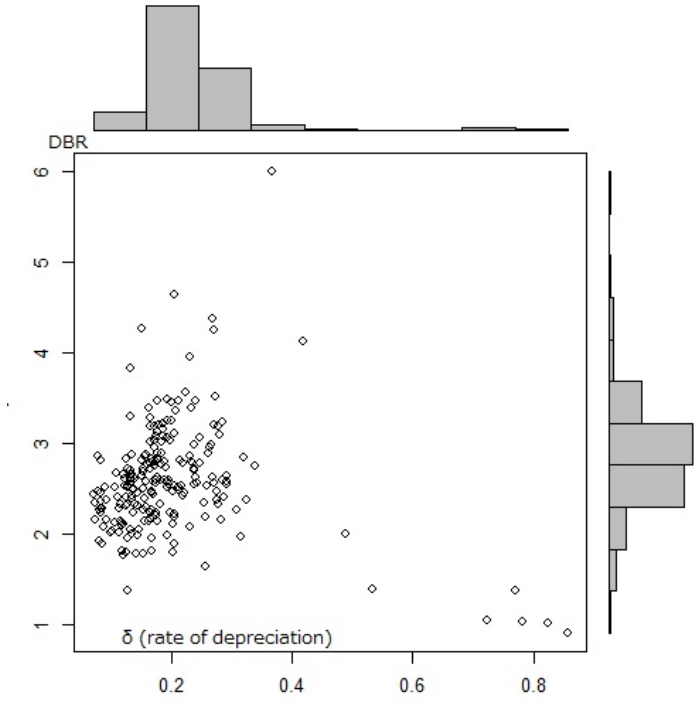


**Figure 4: Estimated Rates of Depreciation and DBRs**

In the comparison between Canada and Japan, the average rate of depreciation for building and construction is considerably higher in Japan (by 3 percentage points in Table 4). Table 5 presents the estimates of the average service lives ($T$), rates of depreciation ($\delta$), and the DBRs for the six types of buildings by types of building structure: wooden, SR (steel-framed reinforced concrete), RC (reinforced concrete), S (steel-framed), and other structure. Although data uncertainty should be noted,[24] we could not find a clear relationship between the physical robustness and the asset service life. In all types of buildings, wooden buildings have longer service lives than SRC buildings, which tend to be at locations commanding higher land prices.[25] It therefore seems reasonable that the retirement pattern depends more on economic decisions, and that shorter service lives and higher depreciations are observed in countries confronted by higher land prices.[26]

[24] In many samples it is difficult to check the validity of reported building structures and the comparison by type of structure is subject to more data uncertainty.

[25] Reflecting the market prices of second-hand buildings, on the other hand, the wooden buildings have higher rates of depreciation rate, thus higher DBRs, relative to more durable buildings, as in houses owned by corporations.

[26] There are a large gap in the relative prices of lands between Tokyo and Vancouver, B.C. According to The World Land Value Survey of 2011 by Japan Association of Real Estate Appraisers, PPPs for land for dwellings are 186–341 (Yen/C$) and the relative prices are 2.0–3.7 times higher in Tokyo. For the land in commercial areas, PPPs for land are 612–1242 (Yen/C$) and the relative prices are 6.7–13.6 times higher.

**Table 5: Service Lives and Rates of Depreciation by Building Structure**

| | Wooden | | | SRC | | | RC | | | S | | | Others | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | δ | DBR | T | δ | DBR | T | δ | DBR | T | δ | DBR | T | δ | DBR |
| Houses owned by corpoations | 33.7 | .084 | 2.82 | 28.8 | .075 | 2.15 | 36.4 | .078 | 2.86 | 26.3 | na | na | 29.3 | na | na |
| Complex housing owned by corporations | 33.8 | na | na | 30.8 | .080 | 2.47 | 34.4 | .071 | 2.45 | 29.0 | na | na | 29.6 | na | na |
| Plants | 37.2 | na | na | 28.2 | .084 | 2.36 | 28.2 | .080 | 2.27 | 27.1 | .082 | 2.23 | 23.6 | .107 | 2.53 |
| Warehouses | 30.3 | na | na | 28.1 | .089 | 2.51 | 27.1 | .084 | 2.28 | 26.5 | .086 | 2.29 | 20.0 | .114 | 2.28 |
| Offices | 29.5 | na | na | 25.3 | .094 | 2.37 | 31.4 | .075 | 2.35 | 23.7 | .088 | 2.08 | 17.6 | .119 | 2.09 |
| Stores | 17.9 | na | na | 14.7 | .121 | 1.77 | 21.9 | .086 | 1.89 | 19.7 | .108 | 2.13 | 10.8 | .169 | 1.82 |

Note: SRC: steel-framed reinforced concrete, RC: reinforced concrete, S: steel-framed.
Unit: years for T and % for δ.

Is it really acceptable for an average building and construction depreciates by 11% annually in Japan? This estimate may be considerably beyond the expected rate of depreciation for building and construction not only from the point of the view of the world standards, but also from the "standard" view in Japan. Three different APPs are defined as $\rho_{\tau,i}$ (for surviving assets), $\rho_{\tau,i}^{*1}$ (for the whole assets in definition-1), and $\rho_{\tau,i}^{*2}$ (for the whole assets in definition-2) in Section3 and are measured for 40 types of building and construction. The comparison of the estimated rates are shown in Figure 5. The depreciation rates (definition-1), which take the scrap values into consideration, are lower by 0.1–4.1 percentage points and the average rate is smaller by 1.1 percentage points (10.2% in Table 4) than the estimates in definition-2. The depreciation rate of surviving assets, in which only the values of surviving assets are taken into consideration, are lower by 1.2–13.0 percentage points and the average rate for building and construction is 7.2% as an average using the stock-weights. The gap from the estimate in definition-2 is large as 4.1 percentage points. In each type of buildings, the rates of depreciation of surviving assets are 5.8% for plants, 5.7% for offices, 5.6% for stores, and 6.5% for restaurants. These estimates seems to be close to the "standard" experiences, in which age-price effect of surviving assets in market are strongly reflected. If so, the gap of 4.1 percentage points is originated by our consideration of non-observed retired buildings to correct sample selection biases. As long as the estimates of survival profiles based on better-quality data are accepted, the gap should be justified.

Our estimates based on disposal data can be compared with the estimates using market rent data in Japan. Saita and Higo (2010) found the depreciation rates of the office building for Japan ranged from 4.6–5.6% based on their estimates of the hedonic functions using the rent data[27] and that it was twice larger than the estimate (2.47%) by the Hulten-Wykoff study (1981). This data covers office building in the central Tokyo (five central Wards of Chiyoda, Chuou, Minato, Shibuya, and Shinjuku), owned by the J-RIET (Japan Real Estate Investment Trust) as of the period of 2007. Conceptually the estimates by Saita-Higo are compared with our estimate of the definition-2 (8.7%). The gap of about 3% may be originated from the differences in the service lives. They assume 39–44 years of service lives by referring the study investigates the service

[27] Saita and Higo (2010) carefully controlled the effects by differences in locations, rents of land, equipment attached to building, sample bias that retired buildings are not observed, and replacement investment.

lives of the office buildings in the central Tokyo (four Wards of Chiyoda, Chuou, Minato, and Shinjuku). This is much shorter than our estimates of 17.6–31.4 years as the average ASL for offices (Table 9). In addition, two differences should be in mind. First, our disposal data covers the office buildings not only in the central Tokyo, but in the whole Japan. The share of small and medium size offices are larger in our sample and that makes the service lives shorter and the depreciation rates higher. Second, offices that are not-fully maintained are included in our samples. The data of the offices owned by J-RIET may have a sample bias not only retired assets, but also in the surviving offices. Increasing the observations of less-quality and less-maintained offices may bring out higher depreciation rates. Although further examination will be required, the gap of 3% in office buildings may be reasonable when the coverage expands.

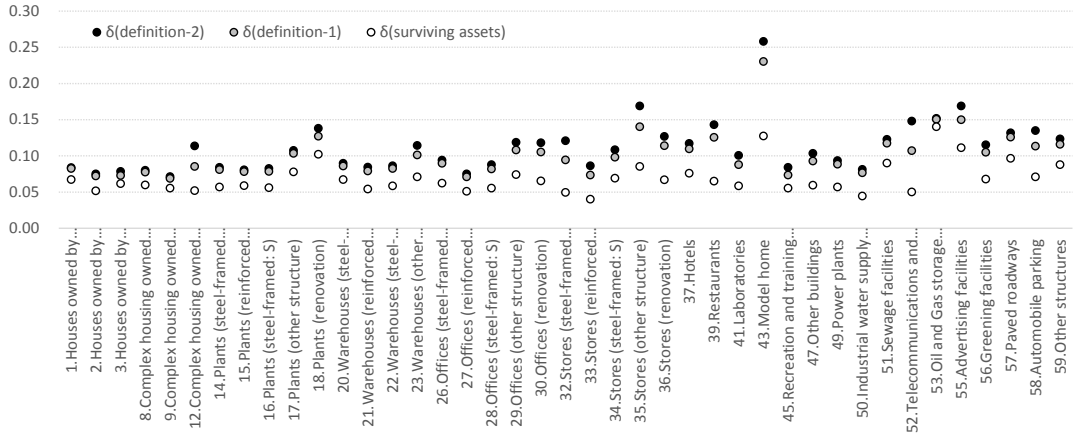


**Figure 5: Estimated Rates of Depreciation and DBRs**

Another important source in explaining the difference in the depreciation rates of buildings with other countries may stem from the consideration of renovation-type assets. Table 6 presents comparisons of the estimates between new acquisition and renovation of buildings. Compared with new construction of buildings, renovation activity has 46.7% shorter service lives and 43.4% higher rates of depreciation. In particular, there is a large gap in the depreciation rates in plants (13.8% for renovation versus 8.2% for new construction) and recreation and training facilities (12.9% for renovation versus 8.4% for new construction). It is a significant factor that will considerably raise the rate of depreciation in time-series of building and construction for the whole economy. Given the distinctive nature of investment, a proper separation of renovation from other building investment may be a key to improving the measurement of capital stock.

**Table 6: New Acquisition and Renovation of Buildings**

| | new assets | | | ranovation | | | renovation/new | |
|---|---|---|---|---|---|---|---|---|
| | T | δ | DBR | T | δ | DBR | T | δ |
| 1.Houses owned by corpoations | 33.4 | .083 | 2.76 | 20.5 | .135 | 2.76 | 0.612 | 1.634 |
| 2.Complex housing owned by corporations | 32.9 | .075 | 2.46 | 17.7 | .114 | 2.01 | 0.537 | 1.522 |
| 3.Plants | 27.7 | .082 | 2.26 | 18.0 | .138 | 2.48 | 0.652 | 1.682 |
| 4.Warehouses | 27.1 | .086 | 2.32 | 18.4 | .126 | 2.32 | 0.679 | 1.470 |
| 5.Offices | 26.8 | .086 | 2.31 | 15.5 | .118 | 1.82 | 0.578 | 1.366 |
| 6.Stores | 18.7 | .106 | 1.99 | 14.2 | .127 | 1.80 | 0.759 | 1.193 |
| 7.Hotesl | 20.0 | .117 | 2.34 | 16.0 | .146 | 2.34 | 0.799 | 1.251 |
| 8.Restaurants | 12.4 | .143 | 1.78 | 10.3 | .173 | 1.78 | 0.825 | 1.213 |
| 9.Laboratories | 20.1 | .101 | 2.02 | 18.7 | .108 | 2.02 | 0.932 | 1.073 |
| 10.Model home | 6.4 | .258 | 1.64 | 7.7 | .212 | 1.64 | 1.217 | 0.822 |
| 11.Recreation and training facilities | 29.3 | .084 | 2.45 | 19.1 | .129 | 2.45 | 0.652 | 1.535 |
| 12.Other buildings | 19.8 | .103 | 2.04 | 16.0 | .128 | 2.04 | 0.809 | 1.236 |
| Total | 25.6 | .091 | 2.33 | 16.2 | .131 | 2.12 | 0.633 | 1.434 |

Unit: years for T and % for δ.

Table 7 presents the estimates of the average asset service lives and the depreciation rates for motor vehicles by type of use. Our asset classification allows us to compare the differences of depreciation rates by four types of use: firm-own use, passenger use, freight use, and demonstration-use. Although demonstrator cars have very shorter lives of 1.1–1.3 years and high depreciation rates of over 80%, it marks a clear difference from own use and freight use. For passenger use, ordinary cars including taxis have faster rates of depreciation than that for other uses.

**Table 7: Service Lives and Rates of Depreciation by Use Types of Vehicles**

| | own use | | | passenger use | | | freight use | | | demonstration use | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | T | δ | DBR | T | δ | DBR | T | δ | DBR | T | δ | DBR |
| Light passenger car | 9.5 | .271 | 2.56 | | | | 9.8 | .259 | 2.53 | 1.1 | .884 | 0.94 |
| Small passenger car | 8.9 | .291 | 2.59 | | | | 9.0 | .293 | 2.64 | 1.3 | .824 | 1.09 |
| Ordinary passenger car | 9.1 | .285 | 2.59 | 7.3 | .324 | 2.38 | 9.8 | .269 | 2.63 | 1.2 | .845 | 1.04 |
| Minibus | 13.0 | .194 | 2.52 | 14.7 | .178 | 2.62 | | | | | | |
| Motor coaches | 14.6 | .171 | 2.50 | 16.8 | .166 | 2.78 | | | | | | |
| Mini-sized pickup truck | 12.3 | .204 | 2.50 | | | | 12.1 | .204 | 2.47 | | | |
| Pickup truck | 11.1 | .221 | 2.46 | | | | 11.7 | .217 | 2.54 | | | |
| Truck | 11.2 | .199 | 2.23 | | | | 11.7 | .212 | 2.49 | | | |

Unit: years for T and % for δ.

Comparing the results of the two assumptions on the values of retired assets, the rate of depreciation using definition-2, in which retired assets have zero values, is 1.1 percentage points and 2.1 percentage points higher for building and construction and for machinery and equipment respectively than the estimates based on definition-1. As an aggregated measure for corporations, a difference in the depreciation rate of 1.4 percentage point gap may generate a significant impact on the measurement of capital stock level. The difference in these two definitions also requires a different way to record the remained values of retired assets in GFCF. The choice between the two definitions is conceptually difficult and data for scrap values require further examinations. The treatment of the remained values in retired assets would be of more importance, especially in the well-developed economies with accelerating depreciations.

## 5 Conclusion

This paper is the second report on the measurement of asset service lives and depreciation rates, based on the disposal data collected by the CED implemented by ESRI, Cabinet Office of Japan. Although the high depreciation rates and DBRs estimated in Canada (2007), in particular for building and construction, may not necessarily be treated as standards in the world, our estimates strongly support their high rates of depreciation and high DBRs than the traditional views of the parameters involved in the U.S. NIPA. The estimates of depreciation rates based on sold assets with positive prices in disposal data should be compared carefully with the estimates by the market rental data. Although further examinations will be required, the depreciation rates estimated based on rental market prices may be somewhat downwardly biased, since assets tends to obtain a superior quality and to be fully maintained.

Although we have tried to define the differences in the properties as the assets, some differences not controlled by disaggregating assets may arise as the differences in APP among industries. To watch the details carefully, further data cleaning is required. The evidences on the aging pattern of the assets will be incorporated in the next revision of the capital stock accounts in JSNA.

## Appendix.1 Data Adjustment

(this part will be added later..)

## Appendix.2 Supplementary Tables

### Table 8: Aggregated Estimates of Asset Service Lives and Depreciation Rates

| asset classification | code | weight (‰) | T (years) | definition-1 δ (%) | definition-1 DBR | definition-2 δ (%) | definition-2 DBR |
|---|---|---|---|---|---|---|---|
| Total Assets owned by corporations | | 1000 | 18.6 | .139 | 2.58 | .153 | 2.84 |
| 1.Dwellings | | 39.8 | 32.9 | .077 | 2.53 | .080 | 2.62 |
| 1.Houses owned by corpoations | 101 | 20.7 | 33.2 | .081 | 2.70 | .084 | 2.77 |
| 2.Complex housing owned by corpoations | 102 | 19.1 | 32.6 | .072 | 2.35 | .076 | 2.46 |
| 2.Buildings other than dwellings | | 235.1 | 24.0 | .087 | 2.09 | .095 | 2.27 |
| 3.Plants | 201 | 72.5 | 27.4 | .079 | 2.18 | .083 | 2.28 |
| 4.Warehouses | 202 | 12.2 | 26.7 | .083 | 2.22 | .087 | 2.34 |
| 5.Offices | 203 | 60.8 | 26.5 | .082 | 2.18 | .087 | 2.30 |
| 6.Stores | 204 | 27.3 | 18.4 | .092 | 1.70 | .108 | 1.98 |
| 7.Hotels | 205 | 11.1 | 19.6 | .112 | 2.19 | .119 | 2.35 |
| 8.Restaurants | 206 | 2.7 | 12.2 | .128 | 1.56 | .146 | 1.78 |
| 9.Laboratories | 207 | 3.5 | 20.0 | .088 | 1.76 | .101 | 2.02 |
| 10.Model home | 208 | 1.6 | 6.4 | .229 | 1.47 | .257 | 1.64 |
| 11.Recreation and training facilities | 209 | 2.5 | 29.1 | .074 | 2.16 | .085 | 2.46 |
| 12.Other buildings | 210 | 40.8 | 19.6 | .094 | 1.84 | .104 | 2.05 |
| 3.Other structures | | 286.2 | 20.0 | .117 | 2.35 | .132 | 2.64 |
| 13.Power plants | 301 | 22.9 | 23.2 | .088 | 2.04 | .093 | 2.16 |
| 14.Industrial water supply facilities | 302 | 11.6 | 23.8 | .076 | 1.82 | .081 | 1.93 |
| 15.Sewage facilities | 303 | 6.0 | 21.4 | .117 | 2.51 | .123 | 2.62 |
| 16.Telecommunications and broadcasting facilities | 304 | 62.9 | 13.9 | .107 | 1.48 | .148 | 2.05 |
| 17.Oil and Gas storage facilities and pipelines | 305 | 41.2 | 28.2 | .150 | 4.24 | .151 | 4.27 |
| 18.Waste disposal facilities | 306 | 4.8 | 15.8 | .154 | 2.43 | .172 | 2.71 |
| 19.Advertising facilities | 307 | 9.8 | 13.4 | .150 | 2.01 | .169 | 2.27 |
| 20.Greening facilities | 308 | 5.0 | 18.7 | .105 | 1.95 | .115 | 2.15 |
| 21.Paved roadways | 309 | 22.3 | 20.5 | .126 | 2.58 | .132 | 2.70 |
| 22.Automobile parking | 310 | 9.2 | 14.9 | .113 | 1.69 | .135 | 2.01 |
| 23.Other structures | 311 | 90.4 | 20.5 | .116 | 2.37 | .123 | 2.53 |
| 4.Installation of equipment | | 68.3 | 14.0 | .148 | 2.08 | .164 | 2.30 |
| 24.Power wiring equipment | 401 | 3.2 | 16.4 | .119 | 1.96 | .137 | 2.24 |
| 25.Power outlet wiring equipment | 402 | 3.9 | 12.7 | .152 | 1.92 | .174 | 2.21 |
| 26.Telecommunications wiring equipment | 403 | 1.0 | 8.9 | .145 | 1.29 | .203 | 1.81 |
| 27.Anti-theft alarm equipment | 404 | 0.3 | 11.6 | .143 | 1.66 | .154 | 1.78 |
| 28.Other electric equipment | 405 | 7.9 | 14.5 | .149 | 2.16 | .159 | 2.31 |
| 29.Water supply equipment | 406 | 6.1 | 19.7 | .122 | 2.41 | .128 | 2.52 |
| 30.Hot - water equipment | 407 | 1.1 | 17.1 | .130 | 2.23 | .143 | 2.45 |
| 31.Water removal equipment | 408 | 2.2 | 18.8 | .134 | 2.51 | .139 | 2.62 |
| 32.Sanitary equipment | 409 | 1.1 | 18.1 | .122 | 2.21 | .128 | 2.33 |
| 33.Septic tanks | 410 | 0.7 | 18.0 | .133 | 2.39 | .140 | 2.51 |
| 34.Gas fitting | 411 | 0.8 | 18.6 | .147 | 2.74 | .151 | 2.81 |
| 35.Ventilation equipment | 412 | 4.8 | 16.2 | .151 | 2.45 | .159 | 2.58 |
| 36.Smoke control equipment | 413 | 0.7 | 15.2 | .164 | 2.50 | .170 | 2.59 |
| 37.Disaster alarm equipment | 414 | 3.4 | 18.1 | .190 | 3.44 | .193 | 3.48 |
| 38.Escape equipment | 415 | 0.1 | 16.2 | .212 | 3.44 | .215 | 3.48 |
| 39.Air curtains and automatic door equipment | 416 | 0.6 | 14.4 | .163 | 2.35 | .169 | 2.44 |
| 40.Arcades and sunshade equipment | 417 | 0.3 | 14.9 | .158 | 2.35 | .164 | 2.44 |
| 41.Interior decorating, partition and furniture | 418 | 6.4 | 9.2 | .178 | 1.64 | .205 | 1.90 |
| 42.Other buildings and accompanying facilities | 419 | 23.9 | 11.7 | .147 | 1.72 | .168 | 1.96 |
| 5.Transport equipment | | 46.2 | 11.5 | .208 | 2.39 | .244 | 2.80 |
| 43.Ships | 501 | 2.1 | 15.3 | .133 | 2.03 | .143 | 2.19 |
| 44.Airplanes | 502 | 6.6 | 10.2 | .108 | 1.10 | .222 | 2.27 |
| 45.Railcar | 503 | 2.1 | 24.2 | .082 | 1.98 | .088 | 2.14 |
| 46.Motor cars | 504 | 18.7 | 8.7 | .277 | 2.41 | .311 | 2.70 |
| 47.Bus and truck | 505 | 10.3 | 12.2 | .196 | 2.39 | .212 | 2.57 |

Note: The average asset service lives (T) and depreciation rates (δ) are aggregated from the 6-digit estimates, using the estmated stock weights.
The DBR (declining balance rates) for aggregated assets are defined based on the aggregated T and δ.

## Table 8: Aggregated Estimates of Asset Service Lives and Depreciation Rates (continued)

| asset classification | code | weight (‰) | T (years) | definition-1 δ (%) | definition-1 DBR | definition-2 δ (%) | definition-2 DBR |
|---|---|---|---|---|---|---|---|
| 48.Other motor vehicles | 506 | 1.0 | 13.5 | .176 | 2.39 | .191 | 2.59 |
| 49.Motorcycles | 507 | 0.4 | 5.5 | .375 | 2.06 | .411 | 2.26 |
| 50.Industrial trailers | 508 | 2.8 | 15.1 | .182 | 2.76 | .190 | 2.88 |
| 51.Other transport equipment | 509 | 2.3 | 15.3 | .192 | 2.92 | .203 | 3.10 |
| 6.ICT equipment | | 36.1 | 9.5 | .251 | 2.39 | .280 | 2.67 |
| 52.Computer equipment | 601 | 11.2 | 7.6 | .265 | 2.01 | .300 | 2.28 |
| 53.Computer attachments | 602 | 8.7 | 8.8 | .228 | 2.00 | .276 | 2.42 |
| 54.Wired telecommunication equipment | 603 | 4.3 | 9.1 | .260 | 2.38 | .278 | 2.54 |
| 55.Wireless telecommunication equipment | 604 | 5.8 | 13.9 | .250 | 3.48 | .255 | 3.55 |
| 56.Office machines | 605 | 6.1 | 10.2 | .254 | 2.58 | .275 | 2.80 |
| 7.Other machinery and equipment | | 233.8 | 14.9 | .183 | 2.73 | .195 | 2.91 |
| 57.Boilers and turbines | 701 | 6.0 | 20.8 | .112 | 2.32 | .122 | 2.53 |
| 58.Engines | 702 | 5.0 | 17.8 | .177 | 3.14 | .181 | 3.21 |
| 59.Carrying equipment | 703 | 8.2 | 19.5 | .151 | 2.95 | .156 | 3.04 |
| 60.Refrigerators | 704 | 6.0 | 16.3 | .172 | 2.80 | .182 | 2.95 |
| 61.Pomps and compressors | 705 | 12.6 | 17.9 | .146 | 2.61 | .153 | 2.74 |
| 62.Industrial robots | 706 | 2.4 | 13.2 | .202 | 2.66 | .209 | 2.75 |
| 63.Other general industrial m&e | 707 | 6.5 | 16.2 | .176 | 2.86 | .184 | 2.99 |
| 64.M&E for agriculture | 708 | 1.1 | 16.9 | .124 | 2.10 | .131 | 2.22 |
| 65.M&E for construction and minig | 709 | 12.0 | 13.7 | .155 | 2.12 | .164 | 2.25 |
| 66.M&E for food industry | 710 | 2.2 | 18.0 | .187 | 3.36 | .194 | 3.49 |
| 67.M&E for textile and apparel industries | 711 | 1.3 | 20.7 | .130 | 2.70 | .136 | 2.80 |
| 68.M&E for lumber and wood industries | 712 | 0.2 | 16.5 | .129 | 2.12 | .151 | 2.48 |
| 69.M&E for pulp and paper industries | 713 | 3.0 | 15.7 | .169 | 2.66 | .174 | 2.75 |
| 70.M&E for chemical industry | 714 | 7.3 | 17.8 | .160 | 2.85 | .169 | 3.01 |
| 71.Plastic working machinery | 715 | 2.1 | 15.8 | .164 | 2.59 | .176 | 2.79 |
| 72.Metal machines | 716 | 11.5 | 19.7 | .150 | 2.97 | .157 | 3.09 |
| 73.Metal working machines | 717 | 5.3 | 19.2 | .141 | 2.71 | .146 | 2.81 |
| 74.Semiconductor manufacturing equipment | 718 | 6.6 | 11.8 | .241 | 2.84 | .251 | 2.95 |
| 75.M&E for other industries in special purpose | 719 | 4.8 | 18.5 | .157 | 2.89 | .163 | 3.01 |
| 76.Machinists' precision tools | 720 | 12.8 | 12.7 | .184 | 2.34 | .200 | 2.53 |
| 77.Molds | 721 | 12.5 | 11.3 | .226 | 2.56 | .244 | 2.76 |
| 78.Other general M&E | 722 | 4.2 | 16.8 | .158 | 2.66 | .165 | 2.77 |
| 79.Equipment for servise industries | 723 | 6.0 | 4.0 | .612 | 2.42 | .642 | 2.54 |
| 80.Electric audio and visual equipment | 724 | 6.6 | 9.6 | .211 | 2.02 | .252 | 2.40 |
| 81.Household electric appliances | 725 | 3.3 | 13.3 | .207 | 2.75 | .227 | 3.02 |
| 82.Electronic appliances | 726 | 9.3 | 13.3 | .198 | 2.62 | .207 | 2.75 |
| 83.Electric measuring instruments | 727 | 3.4 | 15.0 | .206 | 3.09 | .211 | 3.18 |
| 84.Generators and electric motors | 728 | 2.5 | 16.4 | .127 | 2.09 | .145 | 2.39 |
| 85.Other industrial electric M&E | 729 | 21.3 | 16.4 | .128 | 2.10 | .146 | 2.40 |
| 86.Electric lighting fixtures | 730 | 9.8 | 12.1 | .174 | 2.10 | .199 | 2.40 |
| 87.Optical machinery | 731 | 0.9 | 14.4 | .150 | 2.15 | .165 | 2.37 |
| 88.Other precision instrument | 732 | 13.8 | 14.3 | .229 | 3.27 | .237 | 3.38 |
| 89.Textile products | 733 | 1.9 | 11.3 | .173 | 1.94 | .183 | 2.06 |
| 90.Wood products | 734 | 4.0 | 12.8 | .187 | 2.39 | .198 | 2.53 |
| 91.Metal products | 735 | 4.3 | 14.3 | .142 | 2.03 | .161 | 2.31 |
| 92.Musical instruments | 736 | 0.5 | 18.2 | .110 | 1.99 | .117 | 2.12 |
| 93.Information recording mediums | 737 | 0.0 | 9.5 | .204 | 1.94 | .216 | 2.06 |
| 94.Other manufacturing products | 738 | 12.8 | 12.6 | .159 | 2.01 | .169 | 2.13 |
| 8.Cost of ownership transfer | | 13.2 | 9.8 | .198 | 1.95 | .210 | 2.06 |
| 95.Cost of ownership transfer | 801 | 13.2 | 9.8 | .198 | 1.95 | .210 | 2.06 |
| 9.Software | | 41.1 | 10.8 | .186 | 2.01 | .211 | 2.28 |
| 96.Software | 901 | 41.1 | 10.8 | .186 | 2.01 | .211 | 2.28 |

Note: The average asset service lives (T) and depreciation rates (δ) are aggregated from the 6-digit estimates, using the estmated stock weights.
The DBR (declining balance rates) for aggregated assets are defined based on the aggregated T and δ.

# Table 9: Estimated Asset Service Lives and Rate of Depreciation

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution | | | | | | | | Age-Price Profile | | | | | | | | | Estimates | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | (surviving assets) | | | (definition-1) | | | (definition-2) | | | | (definition-1) | | | (definition-2) | |
| | | | α | (t-value) | β | (t-value) | λ | adj $R^2$ | N | T (years) | γ | (t-value) | adj $R^2$ | γ | (t-value) | adj $R^2$ | γ | (t-value) | adj $R^2$ | N | method*) | δ (%) | DBR | δ (%) | DBR |
| 1.Houses owned by corporations (wooden) | 101021 | 14.3 | 1.82 | 91.6 | -6.6 | -99.9 | 37.9 | .922 | 707 | 33.7 | -.069 | -18.6 | .718 | -.086 | -25.4 | .826 | -.087 | -25.7 | .829 | 136 | a | .082 | 2.78 | .084 | 2.82 |
| 2.Houses owned by corporations (steel-framed reinforced concrete: SRC) | 101022 | 2.0 | 2.12 | 61.8 | -7.4 | -68.7 | 32.5 | .948 | 211 | 28.8 | -.053 | -17.7 | .794 | -.075 | -28.6 | .910 | -.078 | -28.7 | .910 | 81 | a | .072 | 2.08 | .075 | 2.15 |
| 3.Houses owned by corporations (reinforced concrete: RC) | 101023 | 3.2 | 1.75 | 44.2 | -6.5 | -50.6 | 40.9 | .896 | 227 | 36.4 | -.063 | -21.5 | .808 | -.076 | -28.1 | .879 | -.082 | -30.0 | .892 | 109 | a | .073 | 2.65 | .078 | 2.86 |
| 4.Houses owned by corporations (steel-framed: S) | 101024 | 0.3 | 1.92 | 57.1 | -6.5 | -63.3 | 29.6 | .972 | 96 | 26.3 | | | | | | | | | | | b | .102 | 2.68 | .105 | 2.76 |
| 5.Houses owned by corporations (other structure) | 101025 | 0.4 | 1.96 | 39.6 | -6.8 | -43.4 | 33.0 | .925 | 128 | 29.3 | | | | | | | | | | | b | .092 | 2.68 | .094 | 2.76 |
| 6.Houses owned by corporations (renovation) | 101029 | 0.5 | 1.42 | 92.4 | -4.4 | -104.2 | 22.5 | .965 | 308 | 20.5 | | | | | | | | | | | b | .131 | 2.68 | .135 | 2.76 |
| 7.Complex housing owned by corporations (wooden) | 102021 | 3.8 | 1.92 | 61.0 | -7.0 | -66.0 | 38.1 | .949 | 201 | 33.8 | | | | | | | | | | | b | .069 | 2.34 | .072 | 2.44 |
| 8.Complex housing owned by corporations (steel-framed reinforced concrete: SRC) | 102022 | 5.0 | 1.75 | 70.1 | -6.2 | -79.2 | 34.6 | .920 | 425 | 30.8 | -.061 | -25.9 | .756 | -.080 | -36.7 | .862 | -.083 | -37.6 | .868 | 215 | a | .077 | 2.38 | .080 | 2.47 |
| 9.Complex housing owned by corporations (reinforced concrete: RC) | 102023 | 8.4 | 2.38 | 115.3 | -8.7 | -128.5 | 38.8 | .956 | 608 | 34.4 | -.057 | -31.3 | .801 | -.071 | -45.3 | .895 | -.074 | -46.8 | .900 | 242 | a | .069 | 2.36 | .071 | 2.45 |
| 10.Complex housing owned by corporations (steel-framed: S) | 102024 | 0.9 | 2.19 | 68.0 | -7.7 | -76.1 | 32.8 | .972 | 135 | 29.0 | | | | | | | | | | | b | .081 | 2.34 | .084 | 2.44 |
| 11.Complex housing owned by corporations (other structure) | 102025 | 0.6 | 2.12 | 48.5 | -7.4 | -53.4 | 33.4 | .946 | 135 | 29.6 | | | | | | | | | | | b | .079 | 2.34 | .082 | 2.44 |
| 12.Complex housing owned by corporations (renovation) | 102029 | 0.4 | 1.78 | 206.9 | -5.3 | -231.6 | 19.9 | .989 | 462 | 17.7 | -.053 | -8.1 | .728 | -.089 | -14.5 | .897 | -.121 | -16.6 | .920 | 24 | a | .085 | 1.51 | .114 | 2.01 |
| 13.Plants (wooden) | 201001 | 2.0 | 1.79 | 131.8 | -6.7 | -147.2 | 41.8 | .979 | 381 | 37.2 | | | | | | | | | | | b | .058 | 2.16 | .061 | 2.26 |
| 14.Plants (steel-framed reinforced concrete: SRC) | 201002 | 8.7 | 1.51 | 224.8 | -5.2 | -264.3 | 31.2 | .977 | 1,212 | 28.2 | -.058 | -18.4 | .831 | -.084 | -30.1 | .929 | -.088 | -30.8 | .932 | 69 | a | .081 | 2.27 | .084 | 2.36 |
| 15.Plants (reinforced concrete: RC) | 201003 | 12.0 | 1.64 | 182.3 | -5.7 | -211.2 | 31.5 | .974 | 895 | 28.2 | -.060 | -9.5 | .780 | -.081 | -13.1 | .872 | -.084 | -13.0 | .870 | 25 | a | .078 | 2.20 | .080 | 2.27 |
| 16.Plants (steel-framed: S) | 201004 | 47.3 | 1.84 | 519.0 | -6.3 | -592.4 | 30.5 | .989 | 2,875 | 27.1 | -.058 | -19.2 | .783 | -.081 | -31.9 | .909 | -.086 | -32.4 | .911 | 102 | a | .078 | 2.12 | .082 | 2.23 |
| 17.Plants (other structure) | 201005 | 0.6 | 1.47 | 252.7 | -4.8 | -284.4 | 26.1 | .970 | 1,951 | 23.6 | -.081 | -19.7 | .856 | -.109 | -28.3 | .925 | -.113 | -28.5 | .926 | 65 | a | .103 | 2.44 | .107 | 2.53 |
| 18.Plants (renovation) | 201009 | 2.0 | 1.64 | 763.6 | -4.9 | -851.9 | 20.2 | .996 | 2,207 | 18.0 | -.108 | -12.0 | .784 | -.136 | -16.0 | .867 | -.148 | -17.1 | .882 | 39 | a | .127 | 2.29 | .138 | 2.48 |
| 19.Warehouses (wooden) | 202001 | 0.9 | 1.82 | 237.4 | -6.4 | -262.5 | 34.1 | .990 | 586 | 30.3 | | | | | | | | | | | b | .073 | 2.20 | .076 | 2.32 |
| 20.Warehouses (steel-framed reinforced concrete: SRC) | 202002 | 1.5 | 1.79 | 140.4 | -6.2 | -160.9 | 31.6 | .972 | 578 | 28.1 | -.070 | -8.7 | .741 | -.090 | -11.7 | .838 | -.094 | -12.0 | .846 | 26 | a | .086 | 2.41 | .089 | 2.51 |
| 21.Warehouses (reinforced concrete: RC) | 202003 | 1.8 | 1.87 | 205.4 | -6.4 | -231.1 | 30.5 | .987 | 567 | 27.1 | -.055 | -16.0 | .910 | -.082 | -28.5 | .970 | -.088 | -29.6 | .972 | 25 | a | .079 | 2.13 | .084 | 2.28 |
| 22.Warehouses (steel-framed: S) | 202004 | 7.4 | 1.74 | 386.1 | -5.9 | -435.7 | 29.8 | .989 | 1,617 | 26.5 | -.060 | -15.2 | .745 | -.086 | -25.4 | .890 | -.090 | -26.6 | .899 | 79 | a | .082 | 2.18 | .086 | 2.29 |
| 23.Warehouses (other structure) | 202005 | 0.1 | 1.66 | 816.0 | -5.2 | -889.6 | 22.3 | .996 | 2,393 | 20.0 | -.073 | -10.8 | .680 | -.106 | -17.3 | .847 | -.121 | -21.5 | .895 | 54 | a | .101 | 2.01 | .114 | 2.28 |
| 24.Warehouses (renovation) | 202009 | 0.5 | 1.58 | 592.1 | -4.8 | -654.5 | 20.5 | .997 | 997 | 18.4 | | | | | | | | | | | b | .120 | 2.20 | .126 | 2.32 |
| 25.Offices (wooden) | 203001 | 1.7 | 1.50 | 143.2 | -5.2 | -161.8 | 32.6 | .969 | 666 | 29.5 | | | | | | | | | | | b | .073 | 2.15 | .077 | 2.27 |
| 26.Offices (steel-framed reinforced concrete: SRC) | 203002 | 24.8 | 1.35 | 343.0 | -4.5 | -435.1 | 27.6 | .985 | 1,737 | 25.3 | -.064 | -19.3 | .741 | -.094 | -30.1 | .874 | -.099 | -30.8 | .879 | 130 | a | .090 | 2.26 | .094 | 2.37 |
| 27.Offices (reinforced concrete: RC) | 203003 | 17.3 | 1.64 | 233.0 | -5.8 | -285.1 | 35.1 | .975 | 1,367 | 31.4 | -.052 | -22.4 | .773 | -.073 | -36.1 | .898 | -.078 | -37.1 | .904 | 147 | a | .071 | 2.22 | .075 | 2.35 |
| 28.Offices (steel-framed: S) | 203004 | 15.3 | 1.68 | 345.6 | -5.5 | -400.2 | 26.6 | .986 | 1,648 | 23.7 | -.057 | -17.2 | .716 | -.085 | -28.7 | .875 | -.092 | -30.0 | .885 | 117 | a | .082 | 1.94 | .088 | 2.08 |
| 29.Offices (other structure) | 203005 | 0.2 | 1.44 | 574.7 | -4.3 | -651.8 | 19.4 | .994 | 2,057 | 17.6 | -.077 | -12.8 | .662 | -.114 | -20.4 | .834 | -.126 | -22.0 | .854 | 83 | a | .108 | 1.90 | .119 | 2.09 |
| 30.Offices (renovation) | 203009 | 1.5 | 1.52 | 699.2 | -4.3 | -786.5 | 17.2 | .995 | 2,537 | 15.5 | -.067 | -13.2 | .695 | -.111 | -24.0 | .883 | -.125 | -25.9 | .898 | 76 | a | .105 | 1.63 | .118 | 1.82 |
| 31.Stores (wooden) | 204001 | 1.2 | 1.33 | 106.9 | -4.0 | -129.9 | 19.5 | .977 | 272 | 17.9 | | | | | | | | | | | b | .093 | 1.67 | .109 | 1.95 |
| 32.Stores (steel-framed reinforced concrete: SRC) | 204002 | 7.3 | 1.36 | 276.5 | -3.8 | -340.2 | 16.0 | .985 | 1,178 | 14.7 | -.051 | -9.0 | .658 | -.099 | -18.5 | .891 | -.129 | -26.0 | .941 | 42 | a | .094 | 1.38 | .121 | 1.77 |
| 33.Stores (reinforced concrete: RC) | 204003 | 6.6 | 1.57 | 129.5 | -5.0 | -161.1 | 24.4 | .959 | 726 | 21.9 | -.041 | -12.1 | .796 | -.076 | -28.8 | .957 | -.090 | -30.4 | .962 | 37 | a | .073 | 1.61 | .086 | 1.89 |
| 34.Stores (steel-framed: S) | 204004 | 10.2 | 1.68 | 231.9 | -5.2 | -279.7 | 22.1 | .979 | 1,168 | 19.7 | -.072 | -18.0 | .820 | -.103 | -29.7 | .925 | -.114 | -31.8 | .934 | 71 | a | .098 | 1.93 | .108 | 2.13 |
| 35.Stores (other structure) | 204005 | 0.1 | 1.49 | 225.7 | -3.7 | -259.1 | 11.9 | .975 | 1,283 | 10.8 | -.089 | -11.6 | .720 | -.151 | -20.9 | .893 | -.185 | -29.1 | .942 | 52 | a | .140 | 1.51 | .169 | 1.82 |
| 36.Stores (renovation) | 204009 | 1.9 | 1.55 | 529.0 | -4.3 | -620.5 | 15.8 | .996 | 1,211 | 14.2 | -.069 | -9.2 | .791 | -.121 | -17.5 | .933 | -.135 | -18.9 | .942 | 22 | a | .114 | 1.62 | .127 | 1.80 |
| 37.Hotels | 205000 | 10.2 | 1.62 | 160.6 | -5.0 | -191.0 | 22.3 | .987 | 350 | 20.0 | -.079 | -9.5 | .735 | -.116 | -15.1 | .877 | -.125 | -16.4 | .894 | 32 | a | .109 | 2.18 | .117 | 2.34 |
| 38.Hotels (renovation) | 205009 | 0.9 | 1.68 | 107.4 | -4.8 | -122.1 | 17.9 | .972 | 332 | 16.0 | | | | | | | | | | | b | .137 | 2.18 | .146 | 2.34 |
| 39.Restaurants | 206000 | 2.4 | 1.53 | 169.5 | -4.0 | -198.3 | 13.8 | .976 | 716 | 12.4 | -.067 | -8.3 | .774 | -.134 | -21.2 | .957 | -.154 | -21.0 | .956 | 20 | a | .125 | 1.56 | .143 | 1.78 |
| 40.Restaurants (renovation) | 206009 | 0.3 | 1.71 | 92.7 | -4.2 | -105.8 | 11.5 | .980 | 178 | 10.3 | | | | | | | | | | | b | .152 | 1.56 | .173 | 1.78 |
| 41.Laboratories | 207000 | 3.4 | 1.56 | 183.7 | -4.9 | -207.9 | 22.3 | .989 | 374 | 20.1 | -.060 | -6.1 | .581 | -.092 | -10.1 | .796 | -.106 | -11.6 | .838 | 26 | a | .088 | 1.76 | .101 | 2.02 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 1)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | (t-value) | β | (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | (t-value) | adj $R^2$ | (definition-1) γ | (t-value) | adj $R^2$ | (definition-2) γ | (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | DBR | (definition-2) δ (%) | DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.Laboratories (renovation) | 207009 | 0.1 | 1.59 | 32.7 | -4.8 | -36.4 | 20.8 | .928 | 84 | 18.7 | | | | | | | | | | | b | .094 | 1.76 | .108 | 2.02 |
| 43.Model home | 208000 | 1.5 | 1.48 | 67.3 | -2.9 | -77.7 | 7.0 | .892 | 550 | 6.4 | -.136 | -4.2 | .249 | -.262 | -8.5 | .584 | -.298 | -9.7 | .648 | 51 | a | .230 | 1.47 | .258 | 1.64 |
| 44.Model home (renovation) | 208009 | 0.0 | 1.41 | 47.8 | -3.0 | -54.5 | 8.5 | .967 | 78 | 7.7 | | | | | | | | | | | b | .189 | 1.47 | .212 | 1.64 |
| 45.Recreation and training facilities | 209000 | 2.5 | 1.88 | 57.1 | -6.6 | -64.4 | 33.0 | .879 | 449 | 29.3 | -.057 | -17.7 | .771 | -.076 | -27.8 | .893 | -.088 | -37.9 | .939 | 93 | a | .073 | 2.15 | .084 | 2.45 |
| 46.Recreation and training facilities (renovation) | 209009 | 0.0 | 1.54 | 27.7 | -4.7 | -31.7 | 21.2 | .852 | 134 | 19.1 | | | | | | | | | | | b | .113 | 2.15 | .129 | 2.45 |
| 47.Other buildings | 210000 | 38.9 | 1.52 | 1052.3 | -4.7 | -1178.1 | 22.0 | .996 | 4,300 | 19.8 | -.061 | -21.9 | .666 | -.097 | -37.9 | .856 | -.109 | -41.8 | .879 | 240 | a | .093 | 1.83 | .103 | 2.04 |
| 48.Other buildings (renovation) | 210009 | 1.9 | 1.58 | 293.7 | -4.6 | -326.5 | 17.8 | .991 | 816 | 16.0 | | | | | | | | | | | b | .115 | 1.83 | .128 | 2.04 |
| 49.Power plants | 301000 | 22.9 | 1.55 | 350.4 | -5.0 | -391.6 | 25.8 | .984 | 1,979 | 23.2 | -.058 | -16.2 | .826 | -.092 | -29.2 | .939 | -.098 | -30.3 | .943 | 55 | a | .088 | 2.04 | .093 | 2.16 |
| 50.Industrial water supply facilities | 302000 | 11.6 | 1.74 | 670.6 | -5.7 | -748.2 | 26.7 | .996 | 1,767 | 23.8 | -.045 | -4.6 | .483 | -.080 | -9.9 | .815 | -.084 | -10.6 | .836 | 22 | a | .076 | 1.82 | .081 | 1.93 |
| 51.Sewage facilities | 303000 | 6.0 | 1.48 | 206.5 | -4.7 | -230.2 | 23.6 | .967 | 1,434 | 21.4 | -.094 | -14.3 | .865 | -.125 | -20.3 | .928 | -.131 | -21.2 | .933 | 32 | a | .117 | 2.51 | .123 | 2.62 |
| 52.Telecommunications and broadcasting facilities | 304000 | 62.9 | 1.88 | 616.8 | -5.2 | -699.9 | 15.6 | .992 | 3,012 | 13.9 | -.051 | -8.8 | .593 | -.113 | -22.4 | .904 | -.160 | -24.6 | .919 | 53 | a | .107 | 1.48 | .148 | 2.05 |
| 53.Oil and Gas storage facilities and pipelines | 305000 | 41.2 | 1.88 | 320.7 | -6.5 | -360.0 | 31.8 | .977 | 2,473 | 28.2 | -.151 | -24.0 | .910 | -.163 | -26.4 | .924 | -.164 | -26.6 | .926 | 57 | a | .150 | 4.24 | .151 | 4.27 |
| 54.Waste disposal facilities | 306000 | 4.8 | 1.70 | 414.9 | -4.9 | -452.8 | 17.7 | .994 | 1,061 | 15.8 | | | | | | | | | | | b | .154 | 2.43 | .172 | 2.71 |
| 55.Advertising facilities | 307000 | 9.8 | 1.60 | 1227.6 | -4.3 | -1379.7 | 15.0 | .996 | 5,846 | 13.4 | -.118 | -22.2 | .844 | -.162 | -34.2 | .928 | -.185 | -39.7 | .945 | 91 | a | .150 | 2.01 | .169 | 2.27 |
| 56.Greening facilities | 308000 | 5.0 | 1.61 | 437.7 | -4.9 | -477.9 | 20.8 | .992 | 1,587 | 18.7 | -.070 | -7.8 | .609 | -.111 | -14.4 | .844 | -.122 | -16.1 | .871 | 38 | a | .105 | 1.95 | .115 | 2.15 |
| 57.Paved roadways | 309000 | 22.3 | 1.53 | 738.9 | -4.8 | -829.5 | 22.8 | .990 | 5,597 | 20.5 | -.101 | -18.2 | .768 | -.134 | -26.5 | .876 | -.141 | -28.4 | .889 | 100 | a | .126 | 2.58 | .132 | 2.70 |
| 58.Automobile parking | 310000 | 9.2 | 1.42 | 809.6 | -4.0 | -897.3 | 16.4 | .995 | 3,017 | 14.9 | -.073 | -11.8 | .637 | -.120 | -20.5 | .842 | -.145 | -25.5 | .892 | 79 | a | .113 | 1.69 | .135 | 2.01 |
| 59.Other structures | 311000 | 90.4 | 1.64 | 1784.3 | -5.2 | -1973.0 | 22.9 | .996 | 11,220 | 20.5 | -.092 | -24.3 | .708 | -.123 | -35.6 | .839 | -.132 | -38.4 | .859 | 242 | a | .116 | 2.37 | .123 | 2.53 |
| 60.Power wiring equipment installation | 401000 | 3.2 | 1.59 | 1032.6 | -4.6 | -1162.8 | 18.3 | .996 | 4,120 | 16.4 | -.086 | -14.5 | .672 | -.127 | -24.7 | .857 | -.147 | -32.4 | .911 | 102 | a | .119 | 1.96 | .137 | 2.24 |
| 61.Power outlet wiring equipment installation | 402000 | 3.9 | 1.43 | 898.1 | -3.8 | -1033.1 | 13.9 | .988 | 9,441 | 12.7 | -.116 | -28.2 | .779 | -.164 | -40.8 | .881 | -.192 | -56.6 | .934 | 225 | a | .152 | 1.92 | .174 | 2.21 |
| 62.Telecommunications wiring equipment installation | 403000 | 1.0 | 1.44 | 430.3 | -3.3 | -482.6 | 9.8 | .983 | 3,219 | 8.9 | -.090 | -9.2 | .589 | -.156 | -15.5 | .801 | -.227 | -32.2 | .946 | 59 | a | .145 | 1.29 | .203 | 1.81 |
| 63.Anti-theft alarm equipment installation | 404000 | 0.3 | 1.49 | 346.2 | -3.8 | -382.9 | 12.9 | .992 | 935 | 11.6 | -.097 | -4.3 | .433 | -.155 | -7.6 | .714 | -.167 | -8.2 | .741 | 23 | a | .143 | 1.66 | .154 | 1.78 |
| 64.Other electric equipment installation | 405000 | 7.9 | 1.51 | 1289.7 | -4.2 | -1489.6 | 16.1 | .997 | 5,719 | 14.5 | -.118 | -16.3 | .679 | -.162 | -24.0 | .822 | -.173 | -25.1 | .835 | 125 | a | .149 | 2.16 | .159 | 2.31 |
| 65.Water supply equipment installation | 406000 | 6.1 | 1.61 | 1151.3 | -5.0 | -1309.7 | 22.0 | .995 | 6,198 | 19.7 | -.096 | -20.4 | .703 | -.131 | -31.1 | .847 | -.137 | -33.1 | .862 | 175 | a | .122 | 2.41 | .128 | 2.52 |
| 66.Hot - water equipment installation | 407000 | 1.1 | 1.75 | 401.6 | -5.2 | -445.6 | 19.2 | .992 | 1,351 | 17.1 | -.101 | -10.8 | .695 | -.140 | -17.1 | .852 | -.155 | -20.7 | .893 | 51 | a | .130 | 2.23 | .143 | 2.45 |
| 67.Water removal equipment installation | 408000 | 2.2 | 1.66 | 897.9 | -5.1 | -1011.9 | 21.0 | .997 | 2,624 | 18.8 | -.112 | -15.5 | .786 | -.144 | -22.1 | .882 | -.150 | -23.4 | .893 | 65 | a | .134 | 2.51 | .139 | 2.62 |
| 68.Sanitary equipment installation | 409000 | 1.1 | 1.62 | 708.0 | -4.9 | -800.6 | 20.2 | .996 | 1,867 | 18.1 | -.089 | -15.8 | .815 | -.130 | -27.3 | .930 | -.137 | -30.0 | .941 | 56 | a | .122 | 2.21 | .128 | 2.33 |
| 69.Septic tanks installation | 410000 | 0.7 | 1.66 | 508.7 | -5.0 | -554.1 | 20.1 | .997 | 804 | 18.0 | | | | | | | | | | | b | .133 | 2.39 | .140 | 2.51 |
| 70.Gas fitting installation | 411000 | 0.8 | 1.55 | 605.7 | -4.7 | -675.2 | 20.7 | .995 | 1,679 | 18.6 | -.127 | -20.3 | .796 | -.159 | -27.5 | .878 | -.164 | -27.9 | .881 | 105 | a | .147 | 2.74 | .151 | 2.81 |
| 71.Ventilation equipment installation | 412000 | 4.8 | 1.64 | 885.8 | -4.7 | -994.4 | 18.1 | .994 | 4,402 | 16.2 | -.129 | -16.7 | .751 | -.164 | -23.1 | .852 | -.174 | -24.8 | .869 | 92 | a | .151 | 2.45 | .159 | 2.58 |
| 72.Smoke control equipment installation | 413000 | 0.7 | 1.50 | 281.5 | -4.2 | -320.9 | 16.8 | .986 | 1,098 | 15.2 | -.146 | -8.1 | .719 | -.179 | -10.3 | .809 | -.186 | -10.6 | .818 | 25 | a | .164 | 2.50 | .170 | 2.59 |
| 73.Disaster alarm equipment installation | 414000 | 3.4 | 1.53 | 1036.6 | -4.6 | -1188.9 | 20.0 | .996 | 4,228 | 18.1 | -.184 | -13.0 | .758 | -.211 | -15.6 | .817 | -.214 | -15.7 | .821 | 54 | a | .190 | 3.44 | .193 | 3.48 |
| 74.Escape equipment installation | 415000 | 0.1 | 1.23 | 138.0 | -3.5 | -156.1 | 17.3 | .984 | 305 | 16.2 | | | | | | | | | | | b | .212 | 3.44 | .215 | 3.48 |
| 75.Air curtains and automatic door equipment installation | 416000 | 0.6 | 1.70 | 875.2 | -4.7 | -973.4 | 16.2 | .997 | 2,575 | 14.4 | -.140 | -10.3 | .741 | -.178 | -15.0 | .858 | -.186 | -15.7 | .869 | 37 | a | .163 | 2.35 | .169 | 2.44 |
| 76.Arcades and sunshade equipment installation | 417000 | 0.3 | 1.52 | 618.0 | -4.3 | -692.8 | 16.5 | .997 | 1,180 | 14.9 | | | | | | | | | | | b | .158 | 2.35 | .164 | 2.44 |
| 77.Interior decorating, partition and furniture installation | 418000 | 6.4 | 1.49 | 1139.1 | -3.5 | -1261.9 | 10.2 | .986 | 18,312 | 9.2 | -.127 | -26.7 | .700 | -.196 | -45.2 | .870 | -.230 | -54.2 | .906 | 306 | a | .178 | 1.64 | .205 | 1.90 |
| 78.Other buildings and accompanying facilities installation | 419000 | 23.9 | 1.43 | 1207.3 | -3.7 | -1352.2 | 12.9 | .990 | 14,790 | 11.7 | -.093 | -22.5 | .632 | -.159 | -43.4 | .865 | -.184 | -54.7 | .910 | 294 | a | .147 | 1.72 | .168 | 1.96 |
| 79.Ships (improvement) | 501009 | 1.0 | 1.55 | 43.8 | -4.1 | -49.1 | 14.4 | .956 | 89 | 13.0 | | | | | | | | | | | b | .153 | 1.98 | .165 | 2.14 |
| 80.Steel ships | 501010 | 1.0 | 2.14 | 106.2 | -6.4 | -120.4 | 20.3 | .981 | 214 | 18.0 | -.075 | -18.4 | .776 | -.115 | -33.7 | .921 | -.126 | -34.5 | .925 | 97 | a | .108 | 1.95 | .118 | 2.12 |
| 81.Other ships | 501020 | 0.1 | 1.46 | 104.1 | -3.9 | -115.3 | 14.9 | .974 | 294 | 13.5 | -.118 | -11.4 | .672 | -.178 | -18.7 | .847 | -.182 | -19.0 | .852 | 63 | a | .163 | 2.20 | .167 | 2.24 |
| 82.Airplanes | 502000 | 2.4 | 0.65 | 8.8 | -1.5 | -7.8 | 10.2 | .751 | 26 | 14.0 | | | | | | | | | | | c | .074 | 1.03 | .152 | 2.12 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 2)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | α (t-value) | β | β (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | γ (t-value) | adj $R^2$ | (definition-1) γ | γ (t-value) | adj $R^2$ | (definition-2) γ | γ (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | (definition-1) DBR | (definition-2) δ (%) | (definition-2) DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83.Airplanes (improvement) | 502009 | 4.2 | 1.00 | 149.4 | -2.1 | -169.9 | 8.1 | .989 | 256 | 8.1 | | | | | | | | | | | b | .127 | 1.03 | .262 | 2.12 |
| 84.Railcar | 503000 | 1.9 | 2.33 | 97.7 | -7.7 | -104.9 | 27.4 | .962 | 374 | 24.3 | | | | | | | | | | | b | .082 | 1.98 | .088 | 2.14 |
| 85.Railcar (improvement) | 503009 | 0.2 | 2.07 | 315.3 | -6.8 | -356.7 | 26.6 | .982 | 1,777 | 23.6 | | | | | | | | | | | b | .084 | 1.98 | .091 | 2.14 |
| 86.Light passenger car (own use) | 504011 | 0.6 | 2.20 | 184.5 | -5.2 | -199.6 | 10.7 | .944 | 2,026 | 9.5 | -.257 | -34.8 | .810 | -.303 | -46.1 | .882 | -.316 | -49.5 | .896 | 284 | a | .261 | 2.47 | .271 | 2.56 |
| 87.Light passenger car (freight use) | 504013 | 0.4 | 2.61 | 262.4 | -6.3 | -280.9 | 11.0 | .979 | 1,466 | 9.8 | -.232 | -21.9 | .790 | -.282 | -30.7 | .880 | -.300 | -34.1 | .901 | 128 | a | .246 | 2.40 | .259 | 2.53 |
| 88.Light passenger car (demonstration) | 504014 | 0.1 | 1.69 | 136.7 | -0.3 | -31.7 | 1.2 | .960 | 775 | 1.1 | | | | | | | | | | | c | .217 | 0.23 | .884 | 0.94 |
| 89.Small passenger car (own use) | 504021 | 5.4 | 2.46 | 565.4 | -5.7 | -607.1 | 10.0 | .971 | 9,556 | 8.9 | -.291 | -113.4 | .874 | -.333 | -147.8 | .922 | -.344 | -157.4 | .931 | 1,850 | a | .283 | 2.52 | .291 | 2.59 |
| 90.Small passenger car (freight use) | 504023 | 1.6 | 2.78 | 332.9 | -6.4 | -355.8 | 10.1 | .966 | 3,845 | 9.0 | -.292 | -44.6 | .853 | -.333 | -60.0 | .913 | -.347 | -65.4 | .926 | 343 | a | .283 | 2.55 | .293 | 2.64 |
| 91.Small passenger car (demonstration) | 504024 | 0.4 | 1.82 | 304.5 | -0.7 | -170.6 | 1.5 | .974 | 2,462 | 1.3 | | | | | | | | | | | c | .253 | 0.34 | .824 | 1.09 |
| 92.Ordinary passenger cars (own use) | 504031 | 8.2 | 1.89 | 568.0 | -4.4 | -614.6 | 10.3 | .987 | 4,339 | 9.1 | -.269 | -117.2 | .870 | -.323 | -156.9 | .923 | -.335 | -169.1 | .933 | 2,047 | a | .276 | 2.52 | .285 | 2.59 |
| 93.Ordinary passenger cars (passenger use) | 504032 | 0.6 | 3.15 | 72.4 | -6.6 | -77.4 | 8.2 | .872 | 773 | 7.3 | -.310 | -11.9 | .839 | -.379 | -16.6 | .911 | -.392 | -17.4 | .918 | 27 | a | .315 | 2.31 | .324 | 2.38 |
| 94.Ordinary passenger cars (freight use) | 504033 | 1.0 | 2.27 | 179.5 | -5.4 | -193.8 | 11.1 | .971 | 969 | 9.8 | -.255 | -35.7 | .839 | -.302 | -48.8 | .907 | -.313 | -52.2 | .917 | 245 | a | .261 | 2.55 | .269 | 2.63 |
| 95.Ordinary passenger cars (demonstration) | 504034 | 0.3 | 1.84 | 291.8 | -0.6 | -139.8 | 1.4 | .978 | 1,892 | 1.2 | | | | | | | | | | | c | .242 | 0.30 | .845 | 1.04 |
| 96.Bus and Truck (demonstration) | 505004 | 0.1 | 1.56 | 85.2 | -0.7 | -47.1 | 1.6 | .967 | 246 | 1.5 | | | | | | | | | | | c | .151 | 0.22 | .796 | 1.15 |
| 97.Bus and Truck (improvement) | 505009 | 0.1 | 1.74 | 129.5 | -3.9 | -145.4 | 9.6 | .981 | 322 | 8.5 | -.173 | -10.0 | .749 | -.252 | -18.3 | .910 | -.297 | -23.6 | .944 | 33 | a | .223 | 1.90 | .257 | 2.19 |
| 98.Minibus (own use) | 505011 | 0.0 | 2.35 | 72.9 | -6.3 | -78.1 | 14.7 | .971 | 160 | 13.0 | -.141 | -9.8 | .697 | -.198 | -17.9 | .886 | -.216 | -21.0 | .915 | 41 | a | .180 | 2.34 | .194 | 2.52 |
| 99.Minibus (passenger use) | 505012 | 0.0 | 2.33 | 22.7 | -6.5 | -24.9 | 16.6 | .816 | 117 | 14.7 | -.152 | -13.0 | .862 | -.192 | -18.4 | .926 | -.196 | -18.8 | .929 | 27 | a | .175 | 2.58 | .178 | 2.62 |
| 100.Motor coaches (own use) | 505021 | 0.0 | 2.52 | 36.7 | -7.0 | -41.5 | 16.5 | .929 | 104 | 14.6 | | | | | | | | | | | b | .163 | 2.37 | .171 | 2.50 |
| 101.Motor coaches (passenger use) | 505022 | 1.0 | 3.92 | 196.8 | -11.4 | -209.2 | 18.5 | .958 | 1,708 | 16.8 | -.160 | -28.5 | .860 | -.180 | -34.6 | .900 | -.181 | -35.0 | .902 | 132 | a | .165 | 2.76 | .166 | 2.78 |
| 102.Mini-sized pickup truck (own use) | 505031 | 0.1 | 3.00 | 262.3 | -7.9 | -277.2 | 13.7 | .995 | 360 | 12.3 | | | | | | | | | | | b | .194 | 2.37 | .204 | 2.50 |
| 103.Mini-sized pickup truck (freight use) | 505033 | 0.1 | 2.59 | 153.2 | -6.8 | -163.1 | 13.6 | .978 | 524 | 12.1 | -.190 | -7.9 | .689 | -.221 | -10.0 | .779 | -.228 | -10.3 | .788 | 28 | a | .199 | 2.41 | .204 | 2.47 |
| 104.Pickup truck (own use) | 505041 | 0.5 | 2.78 | 284.4 | -7.0 | -304.1 | 12.5 | .991 | 712 | 11.1 | -.184 | -19.6 | .701 | -.232 | -29.3 | .841 | -.250 | -31.9 | .862 | 163 | a | .207 | 2.31 | .221 | 2.46 |
| 105.Pickup truck (freight use) | 505043 | 1.0 | 2.55 | 191.3 | -6.6 | -203.0 | 13.2 | .967 | 1,264 | 11.7 | -.174 | -28.4 | .778 | -.227 | -45.2 | .899 | -.245 | -51.6 | .921 | 230 | a | .203 | 2.37 | .217 | 2.54 |
| 106.Truck (own use) | 505051 | 0.6 | 2.47 | 141.8 | -6.3 | -153.6 | 12.7 | .975 | 522 | 11.2 | -.144 | -21.0 | .803 | -.203 | -38.2 | .931 | -.221 | -42.2 | .943 | 108 | a | .183 | 2.06 | .199 | 2.23 |
| 107.Truck (freight use) | 505053 | 5.3 | 2.40 | 183.3 | -6.2 | -199.9 | 13.2 | .946 | 1,930 | 11.7 | -.168 | -68.5 | .873 | -.226 | -121.3 | .956 | -.239 | -134.1 | .963 | 684 | a | .202 | 2.37 | .212 | 2.49 |
| 108.Tractor head | 505060 | 1.4 | 2.35 | 61.9 | -6.2 | -67.1 | 13.9 | .931 | 284 | 12.3 | -.162 | -30.6 | .859 | -.218 | -51.7 | .945 | -.231 | -56.0 | .953 | 154 | a | .196 | 2.41 | .206 | 2.54 |
| 109.Special-purpose motor vehicles and attaching to vehicles | 506010 | 0.9 | 2.23 | 350.0 | -6.1 | -383.7 | 15.5 | .984 | 2,008 | 13.7 | -.143 | -32.9 | .783 | -.190 | -51.0 | .897 | -.209 | -59.3 | .921 | 300 | a | .173 | 2.38 | .189 | 2.59 |
| 110.Other motor vehicles | 506020 | 0.1 | 1.76 | 152.2 | -4.5 | -172.2 | 13.2 | .983 | 407 | 11.8 | -.172 | -13.8 | .801 | -.228 | -21.0 | .904 | -.240 | -22.7 | .916 | 47 | a | .204 | 2.40 | .213 | 2.51 |
| 111.Motorcycles (demonstration) | 507004 | 0.0 | 1.89 | 45.9 | -1.0 | -35.3 | 1.7 | .956 | 98 | 1.5 | | | | | | | | | | | c | .233 | 0.35 | .785 | 1.18 |
| 112.Motorized two-wheeled vehicle | 507010 | 0.1 | 1.79 | 174.3 | -4.1 | -186.8 | 10.0 | .973 | 856 | 8.9 | | | | | | | | | | | b | .207 | 1.84 | .222 | 1.97 |
| 113.Small motorcycles | 507020 | 0.0 | 1.36 | 133.3 | -2.9 | -141.4 | 8.3 | .989 | 197 | 7.6 | | | | | | | | | | | b | .242 | 1.84 | .260 | 1.97 |
| 114.Large motorcycles | 507030 | 0.2 | 1.18 | 24.9 | -1.7 | -22.6 | 4.3 | .796 | 160 | 4.1 | -.452 | -13.8 | .822 | -.622 | -19.8 | .905 | -.672 | -21.4 | .917 | 41 | a | .463 | 1.89 | .489 | 2.00 |
| 115.Industrial trailers (demonstration) | 508004 | 0.0 | 2.38 | 65.8 | -2.6 | -69.1 | 2.9 | .974 | 115 | 2.6 | | | | | | | | | | | c | .130 | 0.34 | .588 | 1.53 |
| 116.Industrial trailers (improvement) | 508009 | 0.3 | 1.58 | 185.8 | -3.9 | -204.1 | 11.6 | .983 | 609 | 10.4 | | | | | | | | | | | b | .261 | 2.71 | .270 | 2.80 |
| 117.Towing tractors | 508010 | 0.2 | 2.00 | 816.1 | -5.9 | -876.2 | 19.2 | .997 | 1,993 | 17.0 | -.167 | -5.2 | .440 | -.202 | -6.7 | .569 | -.206 | -6.9 | .583 | 33 | a | .183 | 3.10 | .186 | 3.16 |
| 118.Platform trailers | 508020 | 0.0 | 1.64 | 103.4 | -4.8 | -107.5 | 18.7 | .977 | 252 | 16.8 | -.086 | -11.8 | .755 | -.134 | -21.0 | .908 | -.150 | -25.7 | .936 | 45 | a | .125 | 2.10 | .139 | 2.33 |
| 119.Fork lift trucks | 508030 | 1.8 | 2.25 | 1002.4 | -6.5 | -1095.3 | 18.0 | .988 | 12,679 | 15.9 | -.151 | -42.4 | .755 | -.186 | -58.7 | .855 | -.193 | -62.7 | .871 | 582 | a | .169 | 2.70 | .176 | 2.80 |
| 120.Other industrial trailers | 508040 | 0.4 | 1.98 | 481.3 | -5.6 | -515.5 | 16.9 | .995 | 1,194 | 15.0 | -.155 | -14.9 | .822 | -.199 | -21.9 | .909 | -.204 | -22.9 | .916 | 48 | a | .180 | 2.71 | .184 | 2.76 |
| 121.Bicycles and manual type wheelchairs | 509010 | 0.1 | 1.38 | 47.7 | -4.0 | -52.4 | 17.6 | .943 | 137 | 16.0 | | | | | | | | | | | b | .185 | 2.97 | .196 | 3.14 |
| 122.Rear cars, carts and rickshaws | 509020 | 0.8 | 1.54 | 673.4 | -4.5 | -722.3 | 18.2 | .994 | 2,565 | 16.4 | -.276 | -12.1 | .755 | -.306 | -14.1 | .807 | -.311 | -14.5 | .816 | 47 | a | .264 | 4.32 | .268 | 4.38 |
| 123.Other transport equipment | 509030 | 1.4 | 1.81 | 1288.6 | -5.1 | -1375.4 | 16.4 | .998 | 3,249 | 14.6 | -.112 | -9.3 | .458 | -.164 | -15.3 | .696 | -.184 | -17.9 | .757 | 102 | a | .152 | 2.21 | .168 | 2.45 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 3)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | α (t-value) | β | β (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | γ (t-value) | adj $R^2$ | (definition-1) γ | γ (t-value) | adj $R^2$ | (definition-2) γ | γ (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | (definition-1) DBR | (definition-2) δ (%) | (definition-2) DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 124.Personal computers | 601010 | 8.1 | 2.57 | 1098.0 | -5.4 | -1156.3 | 8.3 | .955 | 56,503 | 7.4 | -.249 | -41.4 | .713 | -.318 | -63.7 | .855 | -.368 | -79.2 | .901 | 689 | a | .272 | 2.01 | .308 | 2.27 |
| 125.Workstations | 601020 | 0.5 | 2.50 | 224.6 | -5.7 | -236.7 | 9.7 | .973 | 1,411 | 8.6 | -.216 | -11.4 | .860 | -.269 | -16.4 | .928 | -.324 | -20.2 | .951 | 21 | a | .236 | 2.03 | .277 | 2.38 |
| 126.Midrange computers | 601030 | 0.1 | 2.36 | 228.1 | -5.1 | -239.8 | 8.8 | .976 | 1,267 | 7.8 | | | | | | | | | | | b | .256 | 2.01 | .290 | 2.28 |
| 127.Mainframe computers | 601040 | 2.5 | 2.22 | 205.9 | -4.9 | -217.8 | 9.2 | .969 | 1,369 | 8.1 | | | | | | | | | | | b | .247 | 2.01 | .280 | 2.28 |
| 128.Magnetic disc drives | 602010 | 2.2 | 1.83 | 140.4 | -4.1 | -145.0 | 9.3 | .969 | 640 | 8.3 | | | | | | | | | | | b | .240 | 1.99 | .291 | 2.41 |
| 129.Optical disk drives | 602020 | 0.4 | 2.08 | 72.4 | -4.6 | -74.4 | 9.1 | .940 | 335 | 8.0 | | | | | | | | | | | b | .248 | 1.99 | .300 | 2.41 |
| 130.Flexible magnetic disc cartridges | 602030 | 0.0 | 2.25 | 28.2 | -4.6 | -29.1 | 7.8 | .850 | 142 | 6.9 | | | | | | | | | | | b | .288 | 1.99 | .348 | 2.41 |
| 131.Other external memories | 602040 | 0.3 | 1.98 | 153.3 | -4.3 | -158.1 | 9.0 | .980 | 492 | 8.0 | | | | | | | | | | | b | .250 | 1.99 | .302 | 2.41 |
| 132.Printers | 602050 | 1.6 | 2.41 | 506.3 | -5.4 | -532.1 | 9.4 | .974 | 6,937 | 8.4 | -.210 | -17.1 | .744 | -.264 | -24.5 | .856 | -.339 | -38.1 | .935 | 101 | a | .232 | 1.94 | .287 | 2.40 |
| 133.Displays | 602060 | 1.3 | 2.24 | 252.0 | -5.3 | -267.9 | 10.4 | .977 | 1,512 | 9.2 | -.152 | -7.4 | .703 | -.218 | -13.6 | .888 | -.293 | -28.0 | .971 | 23 | a | .196 | 1.81 | .254 | 2.34 |
| 134.Other input-output devices | 602070 | 0.5 | 1.95 | 189.6 | -4.7 | -200.6 | 10.9 | .986 | 509 | 9.6 | | | | | | | | | | | b | .207 | 1.99 | .250 | 2.41 |
| 135.Banking terminals | 602080 | 1.4 | 2.11 | 103.0 | -5.1 | -109.7 | 11.0 | .920 | 923 | 9.7 | | | | | | | | | | | b | .205 | 1.99 | .248 | 2.41 |
| 136.Other terminals | 602090 | 0.5 | 1.97 | 373.0 | -4.5 | -394.1 | 9.8 | .989 | 1,497 | 8.7 | -.275 | -16.3 | .910 | -.319 | -21.1 | .945 | -.346 | -21.8 | .948 | 26 | a | .273 | 2.39 | .292 | 2.55 |
| 137.Other computer attachments | 602100 | 0.4 | 1.84 | 322.7 | -4.3 | -339.3 | 10.1 | .979 | 2,236 | 9.0 | -.238 | -13.0 | .775 | -.304 | -19.7 | .888 | -.322 | -21.6 | .904 | 49 | a | .262 | 2.36 | .275 | 2.47 |
| 138.Telephone equipment | 603010 | 0.3 | 1.62 | 1188.4 | -4.0 | -1265.6 | 12.0 | .998 | 2,976 | 10.7 | -.106 | -7.4 | .497 | -.142 | -10.3 | .656 | -.229 | -20.7 | .886 | 55 | a | .132 | 1.41 | .205 | 2.19 |
| 139.Other telephone systems | 603020 | 0.4 | 1.61 | 1273.5 | -4.1 | -1363.2 | 12.7 | .998 | 3,290 | 11.4 | -.213 | -10.0 | .684 | -.257 | -13.2 | .789 | -.271 | -14.0 | .809 | 46 | a | .227 | 2.59 | .237 | 2.71 |
| 140.Facsimiles | 603030 | 0.3 | 2.59 | 450.3 | -6.3 | -478.2 | 11.3 | .981 | 3,957 | 10.0 | | | | | | | | | | | b | .235 | 2.35 | .252 | 2.52 |
| 141.Automatic telephone switching equipment | 603040 | 0.5 | 2.11 | 530.6 | -5.3 | -580.1 | 12.6 | .994 | 1,627 | 11.2 | -.278 | -14.2 | .834 | -.298 | -15.8 | .862 | -.307 | -16.2 | .867 | 40 | a | .258 | 2.88 | .265 | 2.95 |
| 142.Digital transmission equipment | 603050 | 1.6 | 2.01 | 751.4 | -4.3 | -822.5 | 8.7 | .992 | 4,313 | 7.7 | -.252 | -15.6 | .833 | -.301 | -19.8 | .888 | -.331 | -22.9 | .914 | 49 | a | .260 | 1.99 | .282 | 2.16 |
| 143.Other carrier frequency device and attachments | 603060 | 1.1 | 1.79 | 807.9 | -4.1 | -888.8 | 10.0 | .997 | 2,008 | 8.9 | -.330 | -13.7 | .865 | -.375 | -16.3 | .901 | -.385 | -16.4 | .903 | 29 | a | .313 | 2.79 | .320 | 2.85 |
| 144.Mobile phones, PHS and car telephones | 604010 | 0.5 | 1.61 | 101.0 | -3.9 | -106.3 | 11.4 | .985 | 158 | 10.2 | | | | | | | | | | | b | .333 | 3.40 | .340 | 3.47 |
| 145.Radio and TV broadcasting equipment | 604020 | 1.2 | 2.03 | 325.3 | -5.7 | -347.2 | 16.3 | .987 | 1,346 | 14.4 | -.240 | -7.1 | .709 | -.269 | -8.6 | .784 | -.275 | -9.0 | .798 | 20 | a | .236 | 3.40 | .240 | 3.47 |
| 146.Other mobile-station communication equipment | 604030 | 3.3 | 1.66 | 100.9 | -4.7 | -109.4 | 16.9 | .974 | 276 | 15.1 | | | | | | | | | | | b | .225 | 3.40 | .229 | 3.47 |
| 147.Portable communication equipment | 604040 | 0.0 | 1.19 | 62.9 | -3.3 | -69.6 | 16.6 | .883 | 523 | 15.6 | | | | | | | | | | | b | .218 | 3.40 | .222 | 3.47 |
| 148.Associated radio equipment | 604050 | 0.7 | 1.18 | 182.2 | -2.8 | -202.8 | 10.9 | .995 | 168 | 10.3 | | | | | | | | | | | b | .331 | 3.40 | .337 | 3.47 |
| 149.Other radio communication equipment | 604060 | 0.1 | 1.61 | 195.7 | -4.2 | -210.0 | 13.9 | .981 | 741 | 12.5 | | | | | | | | | | | b | .272 | 3.40 | .278 | 3.47 |
| 150.Copy machines | 605010 | 2.2 | 2.43 | 428.7 | -5.4 | -453.5 | 9.2 | .956 | 8,429 | 8.1 | -.360 | -27.2 | .839 | -.397 | -34.9 | .896 | -.414 | -38.6 | .913 | 142 | a | .328 | 2.66 | .339 | 2.75 |
| 151.Calculator | 605020 | 0.1 | 2.08 | 161.3 | -5.3 | -163.9 | 12.6 | .974 | 691 | 11.1 | | | | | | | | | | | b | .225 | 2.50 | .245 | 2.73 |
| 152.Cash registers | 605030 | 0.1 | 1.79 | 528.8 | -4.1 | -551.0 | 10.1 | .996 | 1,195 | 9.0 | | | | | | | | | | | b | .278 | 2.50 | .304 | 2.73 |
| 153.Word processors | 605040 | 0.0 | 2.90 | 182.7 | -8.1 | -188.1 | 16.5 | .985 | 493 | 14.7 | | | | | | | | | | | b | .170 | 2.50 | .186 | 2.73 |
| 154.Other office machines | 605050 | 3.7 | 2.05 | 951.9 | -5.2 | -972.8 | 12.8 | .992 | 6,859 | 11.4 | -.200 | -13.1 | .610 | -.238 | -16.9 | .724 | -.273 | -21.5 | .809 | 109 | a | .212 | 2.40 | .239 | 2.72 |
| 155.Boilers | 701010 | 2.4 | 1.99 | 711.1 | -6.0 | -788.7 | 20.6 | .993 | 3,738 | 18.2 | -.099 | -7.2 | .589 | -.135 | -10.9 | .766 | -.147 | -12.5 | .811 | 36 | a | .126 | 2.30 | .137 | 2.50 |
| 156.Turbines | 701020 | 3.6 | 1.80 | 77.1 | -5.8 | -87.7 | 25.3 | .930 | 446 | 22.5 | | | | | | | | | | | b | .102 | 2.30 | .111 | 2.50 |
| 157.Engines | 702000 | 5.0 | 1.43 | 252.0 | -4.2 | -279.8 | 19.6 | .989 | 691 | 17.8 | -.160 | -10.8 | .680 | -.194 | -13.6 | .774 | -.199 | -13.9 | .780 | 54 | a | .177 | 3.14 | .181 | 3.21 |
| 158.Elevators and escalators | 703010 | 1.8 | 1.56 | 290.1 | -5.2 | -336.2 | 27.1 | .978 | 1,913 | 24.4 | -.082 | -10.1 | .652 | -.109 | -14.3 | .790 | -.116 | -15.6 | .817 | 54 | a | .103 | 2.51 | .110 | 2.67 |
| 159.Overhead cranes | 703020 | 0.4 | 1.74 | 316.0 | -5.8 | -352.1 | 27.9 | .986 | 1,376 | 24.8 | -.116 | -9.5 | .761 | -.138 | -12.9 | .855 | -.143 | -13.7 | .869 | 28 | a | .129 | 3.21 | .133 | 3.30 |
| 160.Other cranes | 703030 | 0.9 | 1.90 | 346.4 | -6.1 | -383.4 | 24.6 | .993 | 889 | 21.8 | -.088 | -13.1 | .807 | -.115 | -18.6 | .894 | -.118 | -18.9 | .897 | 41 | a | .109 | 2.37 | .111 | 2.42 |
| 161.Winches | 703040 | 0.6 | 1.84 | 179.8 | -5.9 | -190.8 | 24.3 | .984 | 538 | 21.6 | | | | | | | | | | | b | .130 | 2.82 | .135 | 2.91 |
| 162.Conveyers | 703050 | 2.8 | 1.86 | 811.2 | -5.4 | -883.9 | 18.2 | .995 | 3,474 | 16.2 | -.189 | -13.8 | .777 | -.217 | -16.6 | .836 | -.224 | -17.3 | .847 | 54 | a | .195 | 3.16 | .201 | 3.25 |
| 163.Other carrying equipment | 703060 | 1.7 | 1.72 | 305.0 | -5.0 | -334.5 | 18.6 | .968 | 3,058 | 16.6 | -.146 | -16.9 | .737 | -.180 | -22.5 | .833 | -.185 | -23.1 | .840 | 101 | a | .165 | 2.74 | .169 | 2.80 |
| 164.Refrigerators | 704010 | 1.4 | 1.70 | 421.9 | -5.1 | -479.9 | 19.7 | .988 | 2,239 | 17.6 | -.161 | -18.0 | .897 | -.190 | -22.0 | .929 | -.196 | -22.5 | .932 | 37 | a | .173 | 3.04 | .178 | 3.13 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 4)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | (t-value) | β | (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | (t-value) | adj $R^2$ | (definition-1) γ | (t-value) | adj $R^2$ | (definition-2) γ | (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | DBR | (definition-2) δ (%) | DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 165.Refrigerated showcases, including refrigerated display shelf | 704020 | 0.5 | 1.73 | 299.4 | -4.6 | -326.1 | 13.9 | .990 | 947 | 12.4 | -.211 | -14.2 | .863 | -.244 | -17.4 | .904 | -.262 | -18.5 | .914 | 32 | a | .216 | 2.68 | .230 | 2.85 |
| 166.Air conditioners, package type | 704030 | 3.1 | 2.02 | 450.0 | -5.9 | -486.2 | 18.4 | .991 | 1,799 | 16.3 | -.141 | -7.2 | .715 | -.168 | -9.2 | .807 | -.182 | -10.5 | .846 | 20 | a | .154 | 2.52 | .166 | 2.71 |
| 167.Other applied refrigerators | 704040 | 0.4 | 1.86 | 143.8 | -5.3 | -158.7 | 17.0 | .981 | 407 | 15.1 | | | | | | | | | | | b | .185 | 2.79 | .195 | 2.94 |
| 168.Other refrigerators | 704050 | 0.5 | 1.93 | 617.4 | -5.7 | -680.0 | 19.3 | .996 | 1,637 | 17.1 | -.245 | -9.4 | .783 | -.260 | -10.3 | .813 | -.263 | -10.4 | .817 | 24 | a | .229 | 3.91 | .231 | 3.95 |
| 169.Pomps | 705010 | 2.5 | 1.73 | 1186.8 | -5.2 | -1287.8 | 19.5 | .998 | 3,142 | 17.4 | -.124 | -6.0 | .495 | -.157 | -8.1 | .644 | -.165 | -8.6 | .670 | 36 | a | .146 | 2.53 | .152 | 2.64 |
| 170.Compressors | 705020 | 1.5 | 2.18 | 463.4 | -6.6 | -498.9 | 20.5 | .992 | 1,713 | 18.2 | -.152 | -18.2 | .851 | -.175 | -22.7 | .899 | -.182 | -24.0 | .908 | 58 | a | .161 | 2.92 | .166 | 3.02 |
| 171.Fans | 705030 | 0.0 | 1.54 | 163.2 | -4.6 | -178.8 | 20.4 | .985 | 410 | 18.3 | | | | | | | | | | | b | .142 | 2.60 | .149 | 2.72 |
| 172.Vacuum pumps and equipment | 705040 | 1.6 | 1.58 | 237.0 | -4.6 | -261.0 | 17.8 | .985 | 832 | 16.0 | | | | | | | | | | | b | .162 | 2.60 | .170 | 2.72 |
| 173.Hydraulic equipment | 705050 | 3.4 | 1.62 | 263.1 | -5.0 | -285.6 | 22.0 | .984 | 1,132 | 19.7 | -.104 | -9.7 | .777 | -.136 | -14.5 | .886 | -.145 | -16.1 | .906 | 27 | a | .127 | 2.51 | .135 | 2.65 |
| 174.Pneumatic equipment | 705060 | 1.0 | 1.92 | 379.0 | -5.8 | -408.9 | 20.1 | .994 | 888 | 17.8 | | | | | | | | | | | b | .146 | 2.60 | .153 | 2.72 |
| 175.Transmissions | 705070 | 2.4 | 1.73 | 119.3 | -5.1 | -129.3 | 19.0 | .963 | 543 | 16.9 | | | | | | | | | | | b | .153 | 2.60 | .161 | 2.72 |
| 176.Other power transmissions | 705080 | 0.0 | 1.82 | 106.4 | -5.5 | -116.8 | 21.2 | .962 | 444 | 18.9 | | | | | | | | | | | b | .138 | 2.60 | .144 | 2.72 |
| 177.Numerical control robots | 706010 | 0.5 | 2.37 | 249.1 | -6.6 | -267.6 | 16.2 | .987 | 841 | 14.4 | -.177 | -11.0 | .779 | -.205 | -14.1 | .853 | -.212 | -14.9 | .867 | 34 | a | .185 | 2.66 | .191 | 2.74 |
| 178.Other industrial robots | 706020 | 1.9 | 2.08 | 160.5 | -5.6 | -173.8 | 14.5 | .983 | 449 | 12.9 | | | | | | | | | | | b | .207 | 2.66 | .213 | 2.74 |
| 179.Industrial kiln | 707010 | 1.1 | 1.61 | 509.2 | -4.9 | -573.8 | 20.7 | .995 | 1,289 | 18.6 | -.146 | -7.3 | .616 | -.180 | -10.2 | .756 | -.189 | -11.3 | .792 | 33 | a | .165 | 3.06 | .172 | 3.19 |
| 180.Heavy oil and gas firing equipment, including light oil | 707020 | 0.2 | 1.46 | 295.7 | -4.4 | -322.6 | 20.4 | .991 | 786 | 18.5 | -.085 | -15.2 | .741 | -.125 | -25.9 | .893 | -.134 | -28.7 | .911 | 80 | a | .118 | 2.18 | .125 | 2.32 |
| 181.Mechanical parking systems | 707030 | 0.2 | 1.46 | 164.2 | -4.2 | -189.5 | 17.7 | .980 | 545 | 16.0 | -.143 | -30.7 | .965 | -.163 | -37.3 | .976 | -.195 | -43.6 | .982 | 34 | a | .151 | 2.41 | .177 | 2.83 |
| 182.Item and inner packaging machine | 707040 | 1.8 | 2.01 | 632.0 | -5.7 | -688.1 | 17.3 | .996 | 1,484 | 15.4 | -.189 | -23.1 | .916 | -.214 | -29.0 | .945 | -.220 | -29.6 | .947 | 49 | a | .193 | 2.96 | .198 | 3.03 |
| 183.Packaging machines | 707050 | 0.5 | 2.36 | 254.3 | -6.8 | -270.1 | 17.9 | .986 | 887 | 15.9 | -.180 | -10.7 | .825 | -.206 | -13.5 | .883 | -.215 | -14.4 | .896 | 24 | a | .187 | 2.96 | .193 | 3.06 |
| 184.Other general industrial machinery and equipment | 707060 | 2.8 | 1.80 | 4421.0 | -5.2 | -4808.8 | 17.7 | .999 | 29,105 | 15.8 | -.158 | -50.0 | .757 | -.192 | -67.4 | .850 | -.203 | -75.5 | .877 | 801 | a | .175 | 2.75 | .184 | 2.90 |
| 185.Agricultural tractors and ground leveling equipment | 708010 | 0.3 | 1.76 | 32.0 | -5.1 | -35.2 | 18.1 | .884 | 135 | 16.1 | | | | | | | | | | | b | .130 | 2.09 | .138 | 2.21 |
| 186.Cultivation and manegement equipment | 708020 | 0.6 | 2.06 | 125.3 | -6.1 | -136.9 | 19.5 | .968 | 520 | 17.3 | | | | | | | | | | | b | .121 | 2.09 | .128 | 2.21 |
| 187.Feed mill machines | 708030 | 0.0 | 2.30 | 256.0 | -7.2 | -279.3 | 22.4 | .992 | 507 | 19.8 | | | | | | | | | | | b | .105 | 2.09 | .112 | 2.21 |
| 188.Other agricultural machinery and equipment | 708040 | 0.1 | 1.87 | 81.2 | -5.4 | -88.3 | 17.9 | .958 | 287 | 15.9 | | | | | | | | | | | b | .131 | 2.09 | .139 | 2.21 |
| 189.Graders | 709010 | 0.2 | 1.75 | 65.7 | -4.9 | -69.5 | 16.6 | .973 | 120 | 14.8 | -.100 | -23.9 | .859 | -.154 | -44.9 | .956 | -.167 | -49.5 | .963 | 93 | a | .142 | 2.11 | .154 | 2.27 |
| 190.Shovel excavators | 709020 | 6.7 | 1.66 | 247.8 | -4.3 | -269.4 | 13.6 | .990 | 625 | 12.2 | -.123 | -56.7 | .792 | -.182 | -95.3 | .915 | -.194 | -102.1 | .925 | 842 | a | .167 | 2.03 | .176 | 2.14 |
| 191.Excavators, except shovel machinery | 709030 | 0.2 | 2.17 | 64.5 | -5.9 | -70.7 | 15.5 | .970 | 130 | 13.7 | -.079 | -11.5 | .713 | -.153 | -32.7 | .953 | -.157 | -33.5 | .955 | 53 | a | .142 | 1.95 | .145 | 1.99 |
| 192.Construction cranes | 709040 | 1.5 | 1.99 | 58.7 | -5.7 | -61.8 | 17.2 | .940 | 219 | 15.3 | -.084 | -27.8 | .852 | -.133 | -51.7 | .952 | -.137 | -52.0 | .953 | 134 | a | .125 | 1.90 | .128 | 1.96 |
| 193.Construction tractors | 709050 | 0.7 | 2.44 | 32.5 | -6.5 | -35.7 | 14.4 | .940 | 68 | 12.8 | -.111 | -25.3 | .816 | -.163 | -47.3 | .939 | -.192 | -55.7 | .956 | 144 | a | .151 | 1.93 | .175 | 2.23 |
| 194.Asphalt paving machines | 709060 | 0.2 | 3.67 | 56.2 | -10.9 | -58.8 | 19.4 | .969 | 101 | 17.5 | -.131 | -11.5 | .840 | -.164 | -18.1 | .929 | -.167 | -18.4 | .931 | 25 | a | .152 | 2.66 | .154 | 2.70 |
| 195.Concrete machines | 709070 | 0.4 | 2.06 | 119.9 | -6.0 | -129.8 | 18.4 | .972 | 413 | 16.3 | -.200 | -23.0 | .955 | -.222 | -26.9 | .967 | -.232 | -28.5 | .970 | 25 | a | .199 | 3.24 | .207 | 3.36 |
| 196.Machines for foundation work | 709080 | 0.2 | 1.73 | 34.3 | -5.0 | -37.1 | 17.6 | .874 | 170 | 15.7 | | | | | | | | | | | b | .133 | 2.09 | .141 | 2.21 |
| 197.Drills and rock drills | 709090 | 0.3 | 1.86 | 61.3 | -6.0 | -70.3 | 25.3 | .968 | 124 | 22.5 | | | | | | | | | | | b | .093 | 2.09 | .099 | 2.21 |
| 198.Crushers, Mills, sorters and auxiliary machinery | 709100 | 0.5 | 1.73 | 73.7 | -5.1 | -81.9 | 18.4 | .938 | 359 | 16.4 | -.113 | -13.0 | .775 | -.148 | -18.8 | .878 | -.166 | -23.3 | .917 | 49 | a | .137 | 2.26 | .153 | 2.51 |
| 199.Other machinery and equipment for construction and mining | 709110 | 1.1 | 1.89 | 319.0 | -5.4 | -340.9 | 17.3 | .985 | 1,597 | 15.4 | -.120 | -24.9 | .784 | -.161 | -37.7 | .892 | -.169 | -39.9 | .903 | 171 | a | .149 | 2.29 | .156 | 2.40 |
| 200.Grain processing machines | 710010 | 0.5 | 1.83 | 134.8 | -5.9 | -151.5 | 25.6 | .968 | 611 | 22.7 | -.215 | -19.5 | .914 | -.227 | -21.6 | .928 | -.229 | -22.1 | .931 | 36 | a | .203 | 4.61 | .205 | 4.65 |
| 201.Bread-making and confectionery machines | 710020 | 0.5 | 2.21 | 805.7 | -6.6 | -892.0 | 19.4 | .997 | 1,952 | 17.2 | -.208 | -16.3 | .860 | -.223 | -18.0 | .882 | -.225 | -18.1 | .884 | 43 | a | .200 | 3.43 | .201 | 3.45 |
| 202.Milk processing and dairy products machinery | 710030 | 0.2 | 1.73 | 214.9 | -5.1 | -242.0 | 19.3 | .982 | 824 | 17.2 | | | | | | | | | | | b | .197 | 3.39 | .203 | 3.51 |
| 203.Charcuterie and fishery products manufacturing equipment | 710040 | 0.2 | 2.28 | 465.4 | -6.6 | -513.6 | 18.1 | .992 | 1,840 | 16.0 | -.231 | -17.5 | .864 | -.249 | -20.1 | .894 | -.252 | -20.5 | .897 | 48 | a | .221 | 3.53 | .223 | 3.57 |
| 204.Other food processing machinery | 710050 | 0.8 | 1.77 | 902.6 | -5.1 | -997.9 | 18.0 | .991 | 7,363 | 16.0 | -.129 | -14.9 | .630 | -.170 | -22.5 | .796 | -.189 | -28.2 | .859 | 130 | a | .156 | 2.50 | .172 | 2.76 |
| 205.Machines related to spinning | 711010 | 0.4 | 1.23 | 109.8 | -4.0 | -125.2 | 25.2 | .947 | 670 | 23.6 | | | | | | | | | | | b | .113 | 2.66 | .117 | 2.77 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 5)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | (t-value) | β | (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | (t-value) | adj $R^2$ | (definition-1) γ | (t-value) | adj $R^2$ | (definition-2) γ | (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | DBR | (definition-2) δ (%) | DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 206.Looms and braiding machines | 711020 | 0.3 | 2.04 | 138.6 | -6.5 | -151.7 | 23.9 | .978 | 434 | 21.1 | -.102 | -6.7 | .678 | -.132 | -10.0 | .826 | -.138 | -10.7 | .843 | 21 | a | .123 | 2.61 | .129 | 2.72 |
| 207.Dyeing and finishing machines | 711030 | 0.3 | 2.07 | 105.2 | -6.4 | -116.2 | 21.7 | .952 | 558 | 19.2 | | | | | | | | | | | b | .138 | 2.66 | .144 | 2.77 |
| 208.Sewing machinery | 711040 | 0.2 | 2.45 | 169.9 | -7.3 | -177.8 | 19.5 | .987 | 388 | 17.3 | | | | | | | | | | | b | .154 | 2.66 | .160 | 2.77 |
| 209.Other sewing machines | 711050 | 0.0 | 1.92 | 180.3 | -5.7 | -194.0 | 19.8 | .988 | 392 | 17.6 | -.163 | -9.8 | .818 | -.189 | -12.4 | .879 | -.192 | -12.7 | .884 | 21 | a | .173 | 3.04 | .175 | 3.08 |
| 210.Sawmill machines | 712010 | 0.0 | 1.55 | 111.3 | -4.5 | -121.7 | 18.0 | .979 | 272 | 16.2 | | | | | | | | | | | b | .132 | 2.13 | .154 | 2.49 |
| 211.Woodworking machines | 712020 | 0.1 | 2.03 | 228.3 | -6.0 | -243.9 | 19.4 | .991 | 483 | 17.2 | -.139 | -7.1 | .681 | -.167 | -9.2 | .785 | -.175 | -9.9 | .808 | 23 | a | .153 | 2.63 | .161 | 2.76 |
| 212.Plywood machines, including fiberboard machine | 712030 | 0.1 | 2.02 | 176.4 | -5.9 | -195.6 | 18.3 | .989 | 336 | 16.2 | -.082 | -5.7 | .587 | -.119 | -10.0 | .817 | -.155 | -15.3 | .914 | 22 | a | .112 | 1.82 | .143 | 2.32 |
| 213.Pulp and paper making machines | 713010 | 0.3 | 1.75 | 587.2 | -5.4 | -646.9 | 21.8 | .996 | 1,352 | 19.4 | -.153 | -12.1 | .820 | -.176 | -14.6 | .868 | -.180 | -15.0 | .875 | 32 | a | .161 | 3.13 | .164 | 3.19 |
| 214.Printing machinery | 713020 | 1.6 | 2.11 | 476.8 | -5.9 | -536.9 | 16.6 | .993 | 1,564 | 14.7 | -.163 | -19.8 | .803 | -.202 | -28.8 | .896 | -.210 | -31.3 | .911 | 96 | a | .183 | 2.70 | .190 | 2.79 |
| 215.Paper covering machinery | 713030 | 0.5 | 1.76 | 319.5 | -5.2 | -362.8 | 19.7 | .991 | 916 | 17.5 | -.082 | -5.6 | .531 | -.123 | -10.1 | .789 | -.129 | -10.3 | .795 | 27 | a | .116 | 2.03 | .121 | 2.11 |
| 216.Bookbinding machines | 713040 | 0.3 | 2.38 | 141.2 | -7.1 | -150.8 | 19.3 | .987 | 272 | 17.1 | | | | | | | | | | | b | .153 | 2.62 | .158 | 2.71 |
| 217.Plate making machines | 713050 | 0.3 | 2.78 | 159.5 | -7.4 | -170.7 | 14.3 | .978 | 576 | 12.7 | | | | | | | | | | | b | .206 | 2.62 | .213 | 2.71 |
| 218.Filters | 714010 | 0.7 | 1.66 | 226.4 | -4.9 | -245.3 | 19.0 | .989 | 547 | 17.0 | | | | | | | | | | | b | .166 | 2.83 | .176 | 2.99 |
| 219.Sorters | 714020 | 0.6 | 2.00 | 335.6 | -5.9 | -366.5 | 19.6 | .994 | 637 | 17.4 | | | | | | | | | | | b | .163 | 2.83 | .172 | 2.99 |
| 220.Heat exchangers, including partial condensers and heat converters | 714030 | 0.6 | 1.68 | 243.5 | -5.1 | -271.3 | 21.0 | .992 | 471 | 18.8 | | | | | | | | | | | b | .151 | 2.83 | .159 | 2.99 |
| 221.Mixers, agitators, kneaders, dissolvers, granulators, emulsifiers and crushers | 714040 | 0.6 | 1.91 | 743.9 | -5.9 | -809.7 | 21.5 | .997 | 1,557 | 19.1 | -.075 | -5.1 | .412 | -.117 | -9.4 | .712 | -.135 | -11.8 | .798 | 35 | a | .111 | 2.11 | .127 | 2.41 |
| 222.Reactors, generators, carbonizes and electrolytic cells | 714050 | 0.8 | 1.72 | 376.3 | -5.1 | -412.6 | 19.6 | .991 | 1,280 | 17.5 | | | | | | | | | | | b | .162 | 2.83 | .171 | 2.99 |
| 223.Evaporators, distillers, digesters and crystallizers | 714060 | 0.1 | 1.90 | 165.5 | -5.9 | -185.1 | 22.5 | .984 | 452 | 20.0 | | | | | | | | | | | b | .142 | 2.83 | .150 | 2.99 |
| 224.Dryers | 714070 | 0.2 | 1.68 | 248.8 | -5.2 | -273.2 | 21.9 | .987 | 841 | 19.6 | -.091 | -7.6 | .662 | -.129 | -12.5 | .842 | -.144 | -15.4 | .890 | 29 | a | .121 | 2.37 | .134 | 2.62 |
| 225.Dust collectors | 714080 | 0.6 | 1.97 | 276.1 | -6.0 | -302.5 | 21.4 | .990 | 765 | 19.0 | | | | | | | | | | | b | .149 | 2.83 | .158 | 2.99 |
| 226.Tanks for chemical equipment | 714090 | 0.6 | 1.88 | 764.0 | -5.9 | -828.2 | 22.6 | .998 | 1,409 | 20.1 | | | | | | | | | | | b | .141 | 2.83 | .149 | 2.99 |
| 227.Chemically treated environment protecting equipment | 714100 | 0.8 | 1.61 | 175.1 | -4.6 | -198.6 | 17.8 | .980 | 631 | 16.0 | | | | | | | | | | | b | .177 | 2.83 | .187 | 2.99 |
| 228.Other equipment for culture and control chemical machinery | 714110 | 1.7 | 1.75 | 1065.8 | -5.2 | -1160.5 | 19.0 | .994 | 6,513 | 16.9 | -.178 | -16.7 | .770 | -.208 | -21.4 | .846 | -.214 | -22.5 | .859 | 83 | a | .187 | 3.17 | .193 | 3.26 |
| 229.Injection molding machines | 715010 | 0.9 | 1.91 | 325.2 | -5.6 | -366.7 | 19.0 | .988 | 1,318 | 16.9 | -.147 | -18.5 | .719 | -.177 | -24.4 | .817 | -.183 | -25.4 | .829 | 133 | a | .162 | 2.74 | .167 | 2.82 |
| 230.Extruders | 715020 | 0.3 | 1.95 | 473.0 | -5.7 | -536.7 | 18.7 | .996 | 839 | 16.6 | -.174 | -14.5 | .890 | -.199 | -17.8 | .924 | -.205 | -18.5 | .929 | 26 | a | .180 | 2.99 | .185 | 3.08 |
| 231.Other plastic working machinery and auxiliary equipment | 715030 | 0.8 | 1.85 | 1575.5 | -5.1 | -1708.7 | 16.1 | .998 | 3,810 | 14.3 | -.132 | -19.7 | .667 | -.172 | -29.2 | .816 | -.201 | -40.5 | .895 | 193 | a | .158 | 2.26 | .182 | 2.60 |
| 232.Numerically controlled lathes | 716010 | 1.3 | 2.18 | 156.1 | -6.9 | -173.2 | 23.6 | .953 | 1,196 | 20.9 | -.154 | -13.3 | .722 | -.175 | -16.4 | .798 | -.177 | -16.7 | .804 | 68 | a | .161 | 3.36 | .162 | 3.40 |
| 233.Other lathes | 716020 | 0.1 | 2.06 | 171.8 | -7.1 | -185.8 | 31.1 | .974 | 802 | 27.5 | | | | | | | | | | | b | .106 | 2.92 | .110 | 3.04 |
| 234.Drilling machines | 716030 | 0.3 | 2.11 | 167.6 | -7.2 | -178.7 | 30.2 | .977 | 668 | 26.7 | | | | | | | | | | | b | .109 | 2.92 | .114 | 3.04 |
| 235.Boring machines | 716040 | 0.2 | 2.69 | 108.0 | -9.6 | -120.1 | 35.3 | .987 | 155 | 31.4 | | | | | | | | | | | b | .093 | 2.92 | .097 | 3.04 |
| 236.Milling machines | 716050 | 0.2 | 2.71 | 157.6 | -9.4 | -170.8 | 32.3 | .978 | 551 | 28.7 | -.127 | -8.6 | .730 | -.141 | -11.1 | .820 | -.143 | -11.5 | .831 | 27 | a | .131 | 3.78 | .133 | 3.83 |
| 237.Grinding machines | 716060 | 1.3 | 2.11 | 404.0 | -6.9 | -438.4 | 25.6 | .992 | 1,312 | 22.7 | -.096 | -12.5 | .614 | -.128 | -19.3 | .791 | -.133 | -20.6 | .811 | 98 | a | .120 | 2.72 | .125 | 2.82 |
| 238.Gear cutting machines and gear finishing machines | 716070 | 0.3 | 2.27 | 49.8 | -7.7 | -53.9 | 29.6 | .945 | 145 | 26.2 | | | | | | | | | | | b | .111 | 2.92 | .116 | 3.04 |
| 239.Special purpose machines for metal cutting | 716080 | 2.3 | 1.97 | 332.3 | -5.7 | -364.2 | 18.4 | .993 | 803 | 16.3 | -.152 | -14.3 | .843 | -.186 | -21.0 | .920 | -.195 | -24.1 | .939 | 38 | a | .170 | 2.76 | .177 | 2.89 |
| 240.Machining centers | 716090 | 1.6 | 1.92 | 107.1 | -5.9 | -121.5 | 21.9 | .932 | 840 | 19.5 | -.172 | -16.3 | .760 | -.195 | -19.5 | .819 | -.196 | -19.7 | .821 | 84 | a | .177 | 3.45 | .178 | 3.46 |
| 241.Other metal machine tools | 716100 | 4.0 | 1.81 | 459.7 | -5.5 | -500.4 | 20.7 | .983 | 3,619 | 18.4 | -.125 | -19.1 | .648 | -.157 | -27.0 | .787 | -.170 | -31.3 | .832 | 198 | a | .146 | 2.67 | .156 | 2.87 |
| 242.Rolling mill machines and attachments | 717010 | 1.3 | 1.92 | 376.8 | -6.0 | -411.8 | 22.3 | .992 | 1,130 | 19.8 | -.091 | -4.8 | .467 | -.132 | -8.0 | .718 | -.138 | -8.6 | .743 | 25 | a | .124 | 2.44 | .129 | 2.54 |
| 243.Finishing equipment | 717020 | 0.7 | 1.66 | 161.2 | -4.7 | -177.9 | 17.3 | .976 | 640 | 15.4 | | | | | | | | | | | b | .174 | 2.68 | .180 | 2.77 |
| 244.Bending machines | 717030 | 0.2 | 2.14 | 117.2 | -6.6 | -126.6 | 22.3 | .980 | 275 | 19.7 | -.162 | -12.7 | .890 | -.180 | -15.6 | .924 | -.182 | -15.9 | .927 | 20 | a | .165 | 3.25 | .167 | 3.29 |
| 245.Hydraulic presses | 717040 | 0.2 | 1.87 | 147.1 | -6.0 | -163.7 | 24.8 | .981 | 426 | 22.0 | -.087 | -8.7 | .740 | -.118 | -13.8 | .879 | -.129 | -16.5 | .913 | 26 | a | .111 | 2.44 | .121 | 2.67 |
| 246.Mechanical presses | 717050 | 1.5 | 1.80 | 423.2 | -5.7 | -467.6 | 24.1 | .991 | 1,580 | 21.4 | -.111 | -14.7 | .738 | -.140 | -20.8 | .849 | -.144 | -21.4 | .856 | 77 | a | .131 | 2.81 | .134 | 2.87 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 6)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | (t-value) | β | (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | (t-value) | adj $R^2$ | (definition-1) γ | (t-value) | adj $R^2$ | (definition-2) γ | (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | DBR | (definition-2) δ (%) | DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 247.Shearing machines | 717060 | 0.1 | 1.81 | 119.6 | -5.6 | -128.9 | 21.6 | .970 | 449 | 19.2 | -.100 | -7.6 | .684 | -.132 | -11.0 | .822 | -.147 | -12.8 | .863 | 26 | a | .124 | 2.39 | .137 | 2.63 |
| 248.Forging machines | 717070 | 0.2 | 1.39 | 97.7 | -4.2 | -111.7 | 21.3 | .966 | 332 | 19.5 | | | | | | | | | | | b | .138 | 2.68 | .142 | 2.77 |
| 249.Wire forming machines | 717080 | 0.4 | 1.71 | 149.2 | -5.0 | -166.1 | 19.2 | .985 | 341 | 17.1 | | | | | | | | | | | b | .156 | 2.68 | .162 | 2.77 |
| 250.Welding apparatus, gas-operated | 717090 | 0.1 | 1.92 | 500.1 | -5.7 | -528.8 | 20.0 | .991 | 2,184 | 17.7 | -.129 | -14.4 | .767 | -.161 | -21.1 | .876 | -.167 | -22.2 | .887 | 63 | a | .149 | 2.63 | .154 | 2.72 |
| 251.Other metal working machinery | 717100 | 0.6 | 1.80 | 1228.2 | -5.3 | -1339.0 | 19.3 | .996 | 6,209 | 17.2 | -.145 | -24.8 | .737 | -.182 | -36.1 | .856 | -.189 | -39.2 | .875 | 219 | a | .166 | 2.86 | .172 | 2.96 |
| 252.Wafer processing equipment | 718010 | 2.4 | 1.46 | 142.8 | -3.7 | -159.2 | 12.7 | .967 | 700 | 11.5 | -.264 | -12.8 | .802 | -.315 | -15.8 | .861 | -.325 | -16.5 | .872 | 40 | a | .270 | 3.12 | .277 | 3.20 |
| 253.Assembly equipment | 718020 | 0.6 | 1.76 | 194.1 | -4.5 | -216.1 | 12.6 | .983 | 636 | 11.2 | -.211 | -11.5 | .687 | -.250 | -14.1 | .768 | -.285 | -19.2 | .860 | 60 | a | .221 | 2.48 | .248 | 2.78 |
| 254.Flat panel and display manufacturing equipment | 718030 | 1.1 | 1.68 | 113.1 | -4.1 | -125.7 | 11.8 | .962 | 500 | 10.5 | -.233 | -17.2 | .875 | -.272 | -21.0 | .913 | -.279 | -21.7 | .918 | 42 | a | .238 | 2.50 | .244 | 2.56 |
| 255.Clean room equipment | 718040 | 0.1 | 2.04 | 112.5 | -5.8 | -123.6 | 16.8 | .981 | 251 | 14.9 | | | | | | | | | | | b | .189 | 2.83 | .197 | 2.94 |
| 256.Pure and ultrapure water systems | 718050 | 1.5 | 1.67 | 175.4 | -4.4 | -199.1 | 14.2 | .972 | 901 | 12.7 | -.193 | -14.2 | .804 | -.234 | -18.3 | .872 | -.247 | -19.8 | .888 | 49 | a | .209 | 2.66 | .219 | 2.78 |
| 257.Other semiconductor manufacturing equipment | 718060 | 0.8 | 1.79 | 1023.7 | -4.7 | -1113.3 | 13.9 | .996 | 4,691 | 12.3 | -.239 | -38.3 | .803 | -.274 | -47.2 | .862 | -.285 | -50.5 | .877 | 358 | a | .240 | 2.96 | .248 | 3.06 |
| 258.Rubber industrial machinery and appliances | 719010 | 0.8 | 1.76 | 257.1 | -5.4 | -287.1 | 21.5 | .982 | 1,201 | 19.1 | -.109 | -13.5 | .819 | -.136 | -18.7 | .897 | -.143 | -20.7 | .914 | 40 | a | .127 | 2.43 | .133 | 2.55 |
| 259.Asphalt emulsion and other asphalt products manufacturing machinery | 719020 | 0.1 | 1.82 | 77.5 | -5.6 | -85.2 | 21.5 | .943 | 362 | 19.2 | | | | | | | | | | | b | .147 | 2.81 | .153 | 2.93 |
| 260.Coke manufacturing machinery | 719030 | 1.1 | 1.49 | 56.1 | -4.9 | -65.1 | 26.4 | .980 | 65 | 23.9 | | | | | | | | | | | b | .118 | 2.81 | .123 | 2.93 |
| 261.Glass industrial special machinery | 719040 | 0.1 | 1.38 | 89.5 | -3.8 | -101.0 | 16.3 | .942 | 491 | 14.9 | | | | | | | | | | | b | .188 | 2.81 | .196 | 2.93 |
| 262.Special machines for chemicals and pharmaceutical preparations manufacturing | 719050 | 0.2 | 1.72 | 361.8 | -4.9 | -388.0 | 17.0 | .985 | 2,033 | 15.2 | -.189 | -8.1 | .676 | -.224 | -10.6 | .781 | -.229 | -10.9 | .792 | 31 | a | .201 | 3.04 | .205 | 3.11 |
| 263.Other equipment for culture and control special industrial machinery | 719060 | 2.5 | 1.77 | 1658.9 | -5.2 | -1825.0 | 18.4 | .994 | 16,942 | 16.4 | -.163 | -33.0 | .741 | -.195 | -43.3 | .831 | -.204 | -46.8 | .852 | 381 | a | .177 | 2.90 | .185 | 3.02 |
| 264.Special steel cutting tools | 720010 | 0.4 | 1.37 | 95.4 | -3.5 | -104.9 | 12.5 | .935 | 629 | 11.4 | | | | | | | | | | | b | .203 | 2.32 | .219 | 2.51 |
| 265.Cemented carbide and diamond tools | 720020 | 1.0 | 1.16 | 161.9 | -2.8 | -175.6 | 11.3 | .991 | 241 | 10.7 | | | | | | | | | | | b | .217 | 2.32 | .234 | 2.51 |
| 266.Pneumatic tools | 720030 | 0.1 | 1.63 | 96.4 | -4.8 | -101.8 | 19.1 | .975 | 236 | 17.1 | | | | | | | | | | | b | .136 | 2.32 | .147 | 2.51 |
| 267.Electric tools | 720040 | 0.3 | 1.88 | 138.6 | -5.5 | -148.2 | 19.1 | .976 | 475 | 17.0 | | | | | | | | | | | b | .137 | 2.32 | .148 | 2.51 |
| 268.Fixtures and accessories for metal machining | 720050 | 4.9 | 1.44 | 801.7 | -3.6 | -863.5 | 11.9 | .994 | 3,793 | 10.8 | -.134 | -7.9 | .383 | -.201 | -12.4 | .608 | -.229 | -14.7 | .685 | 99 | a | .182 | 1.97 | .205 | 2.22 |
| 269.Other machinists' precision tools | 720060 | 6.2 | 1.60 | 1038.4 | -4.4 | -1114.9 | 15.9 | .996 | 4,249 | 14.3 | -.164 | -10.9 | .544 | -.201 | -13.8 | .659 | -.213 | -14.5 | .682 | 98 | a | .182 | 2.61 | .192 | 2.74 |
| 270.Molds for presses | 721010 | 4.3 | 1.49 | 1836.4 | -3.8 | -2005.5 | 13.1 | .998 | 7,457 | 11.8 | -.199 | -10.7 | .486 | -.256 | -14.5 | .635 | -.268 | -15.4 | .660 | 121 | a | .226 | 2.67 | .235 | 2.78 |
| 271.Molds for forging | 721020 | 0.4 | 1.49 | 695.6 | -3.7 | -760.6 | 12.3 | .995 | 2,652 | 11.1 | -.226 | -7.1 | .610 | -.273 | -9.0 | .713 | -.302 | -10.4 | .771 | 32 | a | .239 | 2.65 | .261 | 2.89 |
| 272.Molds for casting, including ones for die-casting | 721030 | 0.9 | 1.43 | 275.4 | -3.4 | -290.8 | 10.8 | .972 | 2,224 | 9.8 | -.489 | -8.5 | .734 | -.529 | -9.4 | .769 | -.543 | -9.5 | .776 | 26 | a | .411 | 4.04 | .419 | 4.13 |
| 273.Molds for plastics | 721040 | 4.4 | 1.43 | 739.9 | -3.6 | -817.0 | 12.2 | .993 | 3,866 | 11.1 | -.153 | -7.1 | .332 | -.213 | -10.2 | .506 | -.247 | -12.2 | .595 | 100 | a | .192 | 2.13 | .219 | 2.43 |
| 274.Molds for rubber and glass | 721050 | 0.4 | 1.51 | 231.3 | -4.0 | -251.3 | 14.4 | .984 | 885 | 13.0 | | | | | | | | | | | b | .195 | 2.54 | .210 | 2.74 |
| 275.Other molds and dies | 721060 | 2.1 | 1.46 | 1093.0 | -3.6 | -1193.5 | 12.0 | .997 | 4,178 | 10.9 | -.192 | -8.5 | .471 | -.250 | -11.6 | .621 | -.276 | -13.2 | .680 | 81 | a | .221 | 2.41 | .241 | 2.63 |
| 276.Fire extinguishing appliances, including appliances for fire engines | 722010 | 0.1 | 1.96 | 52.2 | -6.3 | -56.5 | 25.5 | .929 | 209 | 22.6 | | | | | | | | | | | b | .117 | 2.65 | .122 | 2.76 |
| 277.Valves and Cocks | 722020 | 2.5 | 1.39 | 791.5 | -4.2 | -929.5 | 19.8 | .996 | 2,536 | 18.1 | -.129 | -9.3 | .586 | -.167 | -12.7 | .728 | -.173 | -13.3 | .745 | 60 | a | .154 | 2.78 | .159 | 2.87 |
| 278.Other general machines and equipment | 722030 | 1.6 | 1.74 | 1762.6 | -4.9 | -1924.7 | 16.5 | .997 | 8,869 | 14.7 | -.135 | -14.9 | .570 | -.182 | -22.7 | .755 | -.193 | -24.9 | .787 | 167 | a | .166 | 2.44 | .175 | 2.57 |
| 279.Pinball machines and slots | 723010 | 4.7 | 1.23 | 127.9 | -0.8 | -85.9 | 1.9 | .944 | 971 | 1.8 | -.892 | -5.7 | .508 | -1.325 | -8.6 | .711 | -1.466 | -10.3 | .778 | 30 | a | .734 | 1.31 | .769 | 1.37 |
| 280.Amusement machines for amusement arcade | 723020 | 0.1 | 1.39 | 163.3 | -2.7 | -177.7 | 6.9 | .986 | 367 | 6.3 | -.214 | -6.2 | .599 | -.316 | -9.6 | .786 | -.379 | -12.5 | .862 | 25 | a | .271 | 1.70 | .315 | 1.98 |
| 281.Amusement park and other amusement equipment | 723030 | 0.0 | 1.44 | 100.5 | -3.7 | -111.3 | 12.9 | .978 | 232 | 11.7 | | | | | | | | | | | b | .122 | 1.43 | .129 | 1.51 |
| 282.Automats | 723040 | 0.1 | 2.56 | 139.0 | -6.5 | -148.0 | 12.5 | .959 | 830 | 11.1 | | | | | | | | | | | b | .129 | 1.43 | .136 | 1.51 |
| 283.Cigarette-vending machines | 723050 | 0.0 | 2.19 | 67.0 | -6.3 | -71.0 | 17.5 | .957 | 204 | 15.5 | | | | | | | | | | | b | .092 | 1.43 | .098 | 1.51 |
| 284.Ticket dispensers | 723060 | 0.3 | 3.26 | 224.1 | -8.4 | -246.0 | 13.1 | .986 | 713 | 11.8 | | | | | | | | | | | b | .121 | 1.43 | .128 | 1.51 |
| 285.Other vending machines | 723070 | 0.2 | 2.22 | 155.0 | -5.6 | -168.8 | 12.2 | .983 | 408 | 10.8 | | | | | | | | | | | b | .132 | 1.43 | .139 | 1.51 |
| 286.Industrial washing machines | 723080 | 0.1 | 1.51 | 45.5 | -4.0 | -48.6 | 14.2 | .925 | 169 | 12.8 | | | | | | | | | | | b | .111 | 1.43 | .118 | 1.51 |
| 287.Automobile maintenance and servicing equipment | 723090 | 0.2 | 2.10 | 174.6 | -6.2 | -186.6 | 19.4 | .956 | 1,421 | 17.2 | -.171 | -8.4 | .684 | -.191 | -9.8 | .749 | -.207 | -11.2 | .797 | 32 | a | .174 | 2.99 | .187 | 3.22 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 7)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | α (t-value) | β | β (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | γ (t-value) | adj $R^2$ | (definition-1) γ | γ (t-value) | adj $R^2$ | (definition-2) γ | γ (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | DBR | (definition-2) δ (%) | DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 288.Other Machinery for retail and personal servise industries | 723100 | 0.4 | 1.62 | 423.9 | -4.0 | -459.2 | 11.7 | .989 | 2,090 | 10.4 | -.132 | -6.1 | .451 | -.200 | -10.7 | .722 | -.227 | -13.1 | .795 | 44 | a | .181 | 1.89 | .203 | 2.12 |
| 289.Electric audio equipment | 724010 | 0.3 | 1.83 | 484.9 | -4.9 | -508.4 | 14.7 | .993 | 1,668 | 13.1 | -.178 | -8.5 | .691 | -.209 | -10.6 | .776 | -.243 | -13.7 | .853 | 32 | a | .189 | 2.46 | .216 | 2.82 |
| 290.Television apparatus, except liquid crystal receivers | 724020 | 0.5 | 1.98 | 521.4 | -5.5 | -527.2 | 16.0 | .992 | 2,311 | 14.2 | | | | | | | | | | | b | .139 | 1.97 | .165 | 2.34 |
| 291.Liquid crystal television receivers | 724030 | 3.4 | 1.60 | 244.7 | -3.6 | -244.6 | 9.3 | .986 | 875 | 8.4 | -.211 | -7.2 | .654 | -.266 | -9.4 | .765 | -.326 | -13.5 | .870 | 27 | a | .233 | 1.95 | .278 | 2.33 |
| 292.Video tape recorders | 724040 | 0.2 | 2.05 | 260.3 | -5.5 | -255.4 | 14.5 | .991 | 636 | 12.8 | | | | | | | | | | | b | .153 | 1.97 | .182 | 2.34 |
| 293.Video cameras, except those for broadcast | 724050 | 0.4 | 1.69 | 634.0 | -3.9 | -638.7 | 10.0 | .995 | 1,908 | 9.0 | -.153 | -13.0 | .768 | -.217 | -21.5 | .900 | -.264 | -29.1 | .943 | 51 | a | .195 | 1.75 | .232 | 2.07 |
| 294.Digital cameras | 724060 | 0.6 | 1.91 | 43.9 | -4.5 | -46.3 | 10.4 | .877 | 270 | 9.2 | | | | | | | | | | | b | .213 | 1.97 | .253 | 2.34 |
| 295.DVD videos | 724070 | 0.5 | 1.92 | 94.8 | -4.3 | -93.1 | 9.5 | .973 | 250 | 8.4 | | | | | | | | | | | b | .234 | 1.97 | .278 | 2.34 |
| 296.Other video equipment | 724080 | 0.8 | 1.77 | 193.6 | -4.4 | -194.3 | 12.2 | .974 | 983 | 10.8 | | | | | | | | | | | b | .181 | 1.97 | .216 | 2.34 |
| 297.Consumer-use air conditioners | 725010 | 0.7 | 1.92 | 1095.4 | -5.4 | -1168.0 | 16.5 | .987 | 15,784 | 14.7 | -.122 | -14.2 | .567 | -.156 | -19.9 | .722 | -.184 | -25.4 | .809 | 152 | a | .144 | 2.11 | .168 | 2.47 |
| 298.Heating and moisture retaining electric heating appliances | 725020 | 0.0 | 1.90 | 1143.8 | -5.7 | -1284.6 | 20.3 | .988 | 16,165 | 18.1 | -.096 | -23.3 | .682 | -.130 | -35.6 | .834 | -.144 | -41.7 | .873 | 253 | a | .122 | 2.20 | .134 | 2.42 |
| 299.Electric rice cookers | 725030 | 0.2 | 2.04 | 102.6 | -5.7 | -108.2 | 16.5 | .983 | 180 | 14.6 | | | | | | | | | | | b | .186 | 2.72 | .205 | 2.99 |
| 300.Microwave ovens | 725040 | 0.2 | 1.76 | 284.2 | -4.7 | -289.6 | 14.3 | .995 | 375 | 12.8 | | | | | | | | | | | b | .213 | 2.72 | .234 | 2.99 |
| 301.Other electrothermal cocking appliances | 725050 | 0.5 | 1.83 | 826.6 | -4.8 | -874.0 | 13.5 | .998 | 1,600 | 12.0 | -.202 | -11.8 | .826 | -.230 | -13.9 | .870 | -.265 | -19.9 | .931 | 29 | a | .206 | 2.47 | .233 | 2.79 |
| 302.Electric fans | 725060 | 0.0 | 1.87 | 61.2 | -5.4 | -64.8 | 18.1 | .969 | 122 | 16.1 | | | | | | | | | | | b | .169 | 2.72 | .186 | 2.99 |
| 303.Fans | 725070 | 0.0 | 1.77 | 124.3 | -4.9 | -129.1 | 15.6 | .985 | 241 | 13.9 | | | | | | | | | | | b | .195 | 2.72 | .215 | 2.99 |
| 304.Electric washing machines | 725080 | 0.4 | 1.85 | 145.0 | -5.0 | -155.5 | 15.3 | .988 | 262 | 13.6 | | | | | | | | | | | b | .200 | 2.72 | .219 | 2.99 |
| 305.Electric refrigerators | 725090 | 0.8 | 1.85 | 1159.5 | -4.9 | -1205.8 | 14.5 | .997 | 4,390 | 12.9 | -.274 | -16.2 | .737 | -.298 | -18.2 | .781 | -.318 | -21.2 | .828 | 93 | a | .257 | 3.32 | .273 | 3.52 |
| 306.Vacuum cleaners | 725100 | 0.2 | 2.15 | 246.1 | -5.8 | -253.7 | 14.7 | .983 | 1,049 | 13.0 | | | | | | | | | | | b | .209 | 2.72 | .229 | 2.99 |
| 307.Other household electric appliances | 725110 | 0.3 | 1.72 | 1390.0 | -4.4 | -1460.7 | 13.3 | .998 | 3,732 | 11.9 | -.269 | -16.4 | .784 | -.301 | -19.5 | .836 | -.314 | -20.6 | .852 | 74 | a | .260 | 3.09 | .270 | 3.20 |
| 308.X-ray systems | 726010 | 1.9 | 1.74 | 59.9 | -4.9 | -63.7 | 16.3 | .945 | 209 | 14.5 | -.233 | -12.2 | .865 | -.260 | -14.2 | .897 | -.267 | -14.5 | .901 | 23 | a | .229 | 3.32 | .234 | 3.40 |
| 309.Industrial televisions and videos | 726020 | 0.8 | 1.86 | 212.9 | -4.8 | -231.7 | 12.9 | .993 | 318 | 11.4 | | | | | | | | | | | b | .230 | 2.63 | .240 | 2.75 |
| 310.Electronic microscopes | 726030 | 0.6 | 2.29 | 164.0 | -6.5 | -175.0 | 17.1 | .984 | 425 | 15.1 | | | | | | | | | | | b | .174 | 2.63 | .182 | 2.75 |
| 311.Other electronic appliances | 726040 | 6.0 | 1.71 | 281.4 | -4.6 | -296.9 | 14.5 | .991 | 694 | 12.9 | -.165 | -9.2 | .703 | -.206 | -12.3 | .810 | -.219 | -13.2 | .833 | 35 | a | .186 | 2.41 | .197 | 2.55 |
| 312.Electric meters | 727010 | 0.2 | 1.83 | 264.2 | -5.3 | -273.8 | 18.0 | .989 | 779 | 16.0 | | | | | | | | | | | b | .192 | 3.07 | .197 | 3.15 |
| 313.Electric measuring instruments | 727020 | 0.8 | 2.06 | 320.6 | -5.9 | -338.1 | 17.7 | .982 | 1,898 | 15.6 | -.294 | -11.9 | .811 | -.311 | -13.1 | .839 | -.317 | -13.6 | .847 | 33 | a | .267 | 4.18 | .272 | 4.25 |
| 314.Semiconductor and IC measuring instruments | 727030 | 0.3 | 1.57 | 194.9 | -3.9 | -206.5 | 12.3 | .985 | 580 | 11.1 | -.264 | -19.8 | .873 | -.301 | -23.8 | .908 | -.328 | -28.0 | .932 | 57 | a | .260 | 2.87 | .279 | 3.09 |
| 315.Industrial instruments | 727040 | 0.4 | 2.09 | 134.7 | -6.2 | -142.7 | 19.8 | .987 | 238 | 17.6 | | | | | | | | | | | b | .175 | 3.07 | .180 | 3.15 |
| 316.Other electric measuring instruments | 727050 | 1.6 | 1.86 | 206.3 | -5.2 | -220.1 | 16.7 | .966 | 1,500 | 14.9 | -.158 | -7.5 | .532 | -.188 | -9.4 | .643 | -.192 | -9.6 | .654 | 48 | a | .171 | 2.55 | .175 | 2.60 |
| 317.General purpose engine generators | 728010 | 0.2 | 1.62 | 39.0 | -4.8 | -43.5 | 19.3 | .952 | 77 | 17.3 | | | | | | | | | | | b | .121 | 2.09 | .138 | 2.39 |
| 318.Motor generators | 728020 | 0.1 | 1.55 | 58.4 | -4.5 | -63.9 | 17.9 | .961 | 140 | 16.1 | | | | | | | | | | | b | .130 | 2.09 | .148 | 2.39 |
| 319.Other generater, except for turbine generators | 728030 | 0.1 | 1.60 | 67.7 | -4.6 | -71.1 | 17.4 | .984 | 77 | 15.6 | | | | | | | | | | | b | .134 | 2.09 | .153 | 2.39 |
| 320.Electric motors | 728040 | 2.0 | 1.65 | 68.1 | -4.8 | -75.0 | 18.3 | .984 | 78 | 16.4 | | | | | | | | | | | b | .128 | 2.09 | .146 | 2.39 |
| 321.Switchgears, controlling equipment and switchboards | 729010 | 14.5 | 1.50 | 182.3 | -4.3 | -204.7 | 17.8 | .983 | 582 | 16.0 | | | | | | | | | | | b | .130 | 2.09 | .149 | 2.39 |
| 322.Transformers | 729020 | 1.5 | 1.60 | 96.6 | -5.1 | -105.8 | 23.8 | .978 | 213 | 21.3 | | | | | | | | | | | b | .098 | 2.09 | .112 | 2.39 |
| 323.Arc welding equipment | 729030 | 0.2 | 2.14 | 188.1 | -6.6 | -199.6 | 22.3 | .968 | 1,158 | 19.7 | | | | | | | | | | | b | .106 | 2.09 | .121 | 2.39 |
| 324.Resistance welding equipment | 729040 | 0.1 | 1.58 | 65.1 | -4.5 | -66.3 | 16.9 | .978 | 94 | 15.2 | | | | | | | | | | | b | .138 | 2.09 | .157 | 2.39 |
| 325.Accumulator and power supply equipment | 729050 | 0.5 | 1.47 | 54.9 | -4.3 | -62.7 | 18.4 | .974 | 81 | 16.7 | | | | | | | | | | | b | .125 | 2.09 | .143 | 2.39 |
| 326.Electric furnaces and industrial electric heater | 729060 | 1.0 | 1.58 | 776.0 | -4.7 | -884.7 | 19.6 | .994 | 3,366 | 17.6 | -.092 | -14.4 | .731 | -.127 | -21.2 | .855 | -.146 | -26.9 | .905 | 76 | a | .119 | 2.09 | .136 | 2.39 |
| 327.Power conversion equipment | 729070 | 2.2 | 1.39 | 27.8 | -3.9 | -30.4 | 16.9 | .899 | 88 | 15.4 | | | | | | | | | | | b | .136 | 2.09 | .155 | 2.39 |
| 328.Other industrial electric machinery and equipment | 729080 | 1.3 | 1.70 | 158.4 | -4.9 | -170.0 | 17.6 | .975 | 635 | 15.7 | | | | | | | | | | | b | .133 | 2.09 | .152 | 2.39 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

## Table 9: Estimated Asset Service Lives and Rate of Depreciation (continued, 8)

| 6th-digit classification of asset | code | weight (‰) | Weibull Distribution α | (t-value) | β | (t-value) | λ | adj $R^2$ | N | T (years) | Age-Price Profile (surviving assets) γ | (t-value) | adj $R^2$ | (definition-1) γ | (t-value) | adj $R^2$ | (definition-2) γ | (t-value) | adj $R^2$ | N | Estimates met-hod*) | (definition-1) δ (%) | DBR | (definition-2) δ (%) | DBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 329.Incandescent lamp fixtures | 730010 | 2.0 | 1.60 | 119.8 | -4.4 | -134.4 | 15.3 | .990 | 144 | 13.7 | | | | | | | | | | | b | .152 | 2.09 | .174 | 2.39 |
| 330.Fluorescent luminaires | 730020 | 1.6 | 1.39 | 80.8 | -3.6 | -89.6 | 13.1 | .978 | 150 | 12.0 | | | | | | | | | | | b | .175 | 2.09 | .200 | 2.39 |
| 331.High-intensity discharge lamps | 730030 | 0.1 | 1.78 | 21.8 | -5.3 | -24.5 | 19.7 | .928 | 38 | 17.5 | | | | | | | | | | | b | .119 | 2.09 | .136 | 2.39 |
| 332.Other electric lighting fixtures | 730040 | 6.1 | 1.54 | 145.4 | -3.9 | -159.7 | 12.7 | .981 | 404 | 11.4 | | | | | | | | | | | b | .183 | 2.09 | .209 | 2.39 |
| 333.Cameras | 731010 | 0.6 | 1.49 | 1128.5 | -4.1 | -1255.2 | 15.3 | .995 | 7,021 | 13.8 | -.103 | -21.1 | .763 | -.150 | -34.3 | .894 | -.169 | -41.6 | .926 | 139 | a | .139 | 1.92 | .156 | 2.15 |
| 334.Photographic machines and related and instruments | 731020 | 0.1 | 2.04 | 135.3 | -5.4 | -139.6 | 13.9 | .990 | 189 | 12.3 | | | | | | | | | | | b | .175 | 2.15 | .193 | 2.37 |
| 335.Microscopes and magnifying glasses | 731030 | 0.2 | 2.31 | 195.1 | -6.9 | -201.8 | 19.8 | .976 | 933 | 17.6 | -.150 | -7.2 | .647 | -.177 | -9.4 | .755 | -.190 | -10.5 | .796 | 28 | a | .163 | 2.85 | .173 | 3.04 |
| 336.Motion picture equipment | 731040 | 0.0 | 1.91 | 88.5 | -5.1 | -92.3 | 14.3 | .964 | 295 | 12.6 | | | | | | | | | | | b | .170 | 2.15 | .187 | 2.37 |
| 337.Other optical machinery | 731050 | 0.0 | 1.88 | 294.1 | -5.0 | -313.9 | 14.2 | .988 | 1,021 | 12.6 | -.224 | -14.3 | .828 | -.251 | -17.2 | .875 | -.271 | -19.3 | .898 | 42 | a | .222 | 2.80 | .238 | 2.99 |
| 338.Watches and clocks | 732010 | 0.0 | 1.95 | 110.5 | -5.9 | -114.1 | 20.7 | .988 | 149 | 18.4 | | | | | | | | | | | b | .174 | 3.20 | .181 | 3.32 |
| 339.Physical and chemical instruments | 732020 | 0.3 | 2.25 | 337.5 | -6.6 | -357.7 | 18.5 | .989 | 1,274 | 16.4 | -.446 | -8.5 | .755 | -.455 | -8.8 | .767 | -.455 | -8.8 | .768 | 23 | a | .365 | 5.99 | .366 | 6.00 |
| 340.Instruments and appliances for analyzing, testing, measuring and scaling | 732030 | 7.8 | 1.95 | 1173.5 | -5.7 | -1243.8 | 18.5 | .983 | 23,928 | 16.4 | -.199 | -23.3 | .631 | -.225 | -28.5 | .718 | -.238 | -31.5 | .757 | 318 | a | .202 | 3.31 | .212 | 3.47 |
| 341.Medical and surgical equipment | 732040 | 5.7 | 1.75 | 278.2 | -4.4 | -300.0 | 12.6 | .983 | 1,307 | 11.2 | -.258 | -14.5 | .709 | -.302 | -17.9 | .788 | -.309 | -18.4 | .797 | 86 | a | .261 | 2.93 | .266 | 2.99 |
| 342.Carpets | 733010 | 0.8 | 1.72 | 525.8 | -4.4 | -577.0 | 13.1 | .993 | 1,840 | 11.7 | | | | | | | | | | | b | .166 | 1.94 | .176 | 2.06 |
| 343.Other textile products | 733020 | 1.1 | 1.44 | 452.4 | -3.6 | -491.6 | 12.0 | .995 | 1,095 | 10.9 | | | | | | | | | | | b | .178 | 1.94 | .189 | 2.06 |
| 344.Wooden furniture and fixtures | 734010 | 3.0 | 1.56 | 1623.0 | -4.2 | -1746.0 | 14.7 | .996 | 11,506 | 13.3 | -.152 | -12.1 | .528 | -.204 | -18.2 | .717 | -.216 | -19.7 | .748 | 130 | a | .185 | 2.45 | .194 | 2.58 |
| 345.Wooden doors and windows | 734020 | 0.4 | 1.55 | 230.8 | -4.1 | -254.9 | 14.0 | .991 | 489 | 12.6 | | | | | | | | | | | b | .190 | 2.39 | .201 | 2.53 |
| 346.Pallets | 734030 | 0.4 | 1.84 | 75.5 | -4.5 | -80.7 | 11.5 | .927 | 450 | 10.3 | -.121 | -7.7 | .645 | -.186 | -14.2 | .862 | -.215 | -15.9 | .887 | 32 | a | .170 | 1.74 | .193 | 1.98 |
| 347.Other wood products | 734040 | 0.1 | 1.47 | 120.2 | -3.7 | -129.3 | 12.6 | .972 | 412 | 11.4 | -.282 | -5.7 | .602 | -.329 | -7.0 | .696 | -.334 | -7.1 | .703 | 21 | a | .281 | 3.19 | .284 | 3.23 |
| 348.Metal furniture and furnishings, fixtures | 735010 | 1.0 | 1.59 | 1517.2 | -4.3 | -1631.8 | 14.8 | .995 | 12,221 | 13.3 | -.151 | -23.4 | .664 | -.196 | -33.4 | .801 | -.218 | -41.2 | .860 | 277 | a | .178 | 2.37 | .196 | 2.60 |
| 349.Fabricated structural and Prefabricated architectural metal products | 735020 | 0.7 | 1.61 | 115.4 | -4.3 | -125.7 | 14.7 | .972 | 387 | 13.2 | -.111 | -11.5 | .851 | -.169 | -21.6 | .953 | -.180 | -22.8 | .957 | 23 | a | .156 | 2.05 | .165 | 2.17 |
| 350.Gas and petrol equipment, heaters and cooking appliances | 735030 | 0.4 | 1.57 | 535.5 | -4.2 | -573.7 | 14.6 | .996 | 1,081 | 13.1 | -.090 | -3.7 | .269 | -.155 | -7.3 | .605 | -.178 | -8.8 | .694 | 34 | a | .143 | 1.88 | .163 | 2.14 |
| 351.Metallic containers | 735040 | 0.0 | 1.67 | 75.6 | -4.8 | -86.0 | 18.1 | .948 | 314 | 16.2 | | | | | | | | | | | b | .124 | 2.00 | .141 | 2.29 |
| 352.Metallic tanks and reservoirs | 735050 | 1.5 | 1.44 | 282.5 | -4.1 | -308.5 | 16.9 | .992 | 673 | 15.3 | | | | | | | | | | | b | .131 | 2.00 | .150 | 2.29 |
| 353.Other metal products | 735060 | 0.7 | 1.57 | 1244.0 | -4.5 | -1307.8 | 17.4 | .998 | 2,934 | 15.6 | -.057 | -7.5 | .367 | -.102 | -14.4 | .683 | -.141 | -23.7 | .854 | 96 | a | .097 | 1.51 | .132 | 2.06 |
| 354.Electronic musical instruments | 736010 | 0.2 | 1.83 | 65.6 | -5.1 | -72.4 | 16.0 | .980 | 88 | 14.2 | | | | | | | | | | | b | .137 | 1.94 | .145 | 2.06 |
| 355.Other musical instruments | 736020 | 0.3 | 1.51 | 50.6 | -4.7 | -54.3 | 22.4 | .969 | 82 | 20.2 | | | | | | | | | | | b | .096 | 1.94 | .102 | 2.06 |
| 356.Information recording mediums | 737000 | 0.0 | 1.57 | 205.0 | -3.7 | -213.6 | 10.6 | .973 | 1,179 | 9.5 | | | | | | | | | | | b | .204 | 1.94 | .216 | 2.06 |
| 357.Sporting equipment | 738010 | 1.3 | 1.74 | 156.5 | -4.7 | -164.2 | 14.9 | .988 | 288 | 13.2 | | | | | | | | | | | b | .147 | 1.94 | .155 | 2.06 |
| 358.Advertising and sign and display equipment | 738020 | 1.3 | 1.43 | 678.7 | -3.5 | -752.5 | 11.8 | .989 | 5,200 | 10.7 | -.203 | -9.8 | .592 | -.260 | -13.4 | .732 | -.272 | -14.0 | .746 | 66 | a | .229 | 2.45 | .238 | 2.55 |
| 359.Manequins and other models | 738030 | 0.2 | 1.23 | 66.2 | -2.5 | -72.3 | 7.8 | .944 | 262 | 7.3 | | | | | | | | | | | b | .266 | 1.94 | .283 | 2.06 |
| 360.Industrial models | 738040 | 0.6 | 1.51 | 98.0 | -3.4 | -105.5 | 9.6 | .965 | 350 | 8.7 | | | | | | | | | | | b | .224 | 1.94 | .237 | 2.06 |
| 361.Safety protectors and lifesaving equipment | 738050 | 1.9 | 1.31 | 64.0 | -3.9 | -69.5 | 19.7 | .972 | 120 | 18.2 | | | | | | | | | | | b | .106 | 1.94 | .113 | 2.06 |
| 362.Unit housing | 738060 | 2.4 | 1.33 | 44.7 | -3.3 | -48.9 | 11.7 | .964 | 75 | 10.7 | -.043 | -6.9 | .564 | -.127 | -24.0 | .941 | -.138 | -24.5 | .943 | 36 | a | .119 | 1.28 | .129 | 1.39 |
| 363.Room units | 738070 | 1.7 | 1.47 | 135.0 | -3.7 | -151.3 | 12.7 | .985 | 273 | 11.5 | | | | | | | | | | | b | .168 | 1.94 | .179 | 2.06 |
| 364.Other manufacturing products | 738080 | 3.4 | 1.51 | 1624.9 | -4.0 | -1762.6 | 14.3 | .997 | 8,678 | 12.9 | -.133 | -14.0 | .540 | -.188 | -21.9 | .743 | -.201 | -23.5 | .769 | 166 | a | .171 | 2.20 | .182 | 2.34 |
| 365.OTCs (Planning) | 801010 | 3.6 | 1.18 | 136.3 | -2.7 | -150.8 | 10.2 | .993 | 138 | 9.6 | | | | | | | | | | | b | .202 | 1.94 | .214 | 2.06 |
| 366.OTCs (Administrating) | 801020 | 2.7 | 1.52 | 54.5 | -3.7 | -64.7 | 11.1 | .963 | 115 | 10.0 | | | | | | | | | | | b | .193 | 1.94 | .205 | 2.06 |
| 367.OTCs (Transaction fee) | 801030 | 4.0 | 1.18 | 48.3 | -2.7 | -54.1 | 9.8 | .969 | 75 | 9.2 | | | | | | | | | | | b | .210 | 1.94 | .223 | 2.06 |
| 368.OTCs (Transportation fee) | 801040 | 2.9 | 1.23 | 74.1 | -3.0 | -80.0 | 11.5 | .964 | 208 | 10.7 | | | | | | | | | | | b | .181 | 1.94 | .192 | 2.06 |
| 369.Software | 901000 | 41.1 | 2.44 | 118.0 | -6.1 | -130.1 | 12.1 | .989 | 151 | 10.8 | | | | | | | | | | | b | .186 | 2.01 | .211 | 2.28 |

Note: *) a: T and δ are estimated, b: δ is computed by using the estimated T and the assumed DBR, c: In definition-1, δ is assumed as the estimated δ in the APP of surviving assets and δ is computed by assuming $0.1=(1-\delta)^T$ in definition-2

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