

# From the Demographics Lens: US is definitely not Japan and neither is Germany

## Global Demographics Research

### Contributors

Amlan Roy  
+44 20 7888 1501  
[amlan.roy@credit-suisse.com](mailto:amlan.roy@credit-suisse.com)

Sonali Punhani  
+44 20 7883 4297  
[sonali.punhani@credit-suisse.com](mailto:sonali.punhani@credit-suisse.com)

There has been a lot in the press about the US behaving similar to Japan by entering a prolonged period of deflation cum recession. We provide insights into demographic differences between the US and Japan cautioning against drawing such parallels.

- In this report, we highlight demographic differences across the US, Japan and Germany. The US is in a demographically favourable position compared to most other advanced countries and is poised to overtake many emerging countries with its positive demographics. Japan and Germany are the oldest and second oldest countries in the world (in terms of median age) but there exists important demographic differences between them.
- The US has a growing population while the populations of Japan and Germany are shrinking. The sources of population change have been different across these three countries with economic and social implications for the present and the future. Over last three decades or so, German population growth has been dominated by a high level of immigration whereas in contrast Japan has seen near-negligible immigration.
- The current age structure of Japan differs markedly from that of the US now and it was very different in the 1990s too. See the population pyramids in the text.
- We analyze the labour force differences in terms of labour productivity and male-female differences (gender gaps) in economic activity rates. These labour force differences contribute significantly to GDP growth differences.
- Fiscal positions affected by demographics-related expenditures of these economies is also very different, leading us to caution against loose broad analogies between Japan and the US that are quite prevalent but miss out, in our view, on the fundamental drivers.
- Household structures have changed over time across all these countries and differing household structures have influenced the consumer and worker behaviour in these countries too. Also, differing savings patterns across these countries have varied effects on capital flows and current accounts. Differences in post-retirement life spans and adequacy of living conditions of the elderly make it difficult to argue for broad similarities across these countries.

## From the Demographics Lens: US is definitely not Japan and neither is Germany

In previous reports, we highlighted the demographic differences across countries, individually or in groups classified together based on similar GDP or similar GDP growth or geographic proximity<sup>1</sup>. In this report, we conduct a comparative analysis across three of the richest and most populous advanced countries – Germany, Japan and the US. The biggest economic issues facing these advanced countries currently are weak GDP growth, high unemployment and large fiscal strains, and in earlier research we have detailed the demographic linkages to economic growth and fiscal sustainability.

Many recent commentators draw parallels across these countries and it appears quite fashionable to compare Japan in the 1990s to the US today. Although most developed countries are experiencing falling population and labour force growth rates as well as increasing life expectancy and old age dependency, the patterns across them differ. We highlight the differences in terms of population indicators, labour force structure and household characteristics along with their subsequent implications on GDP growth, fiscal balances and pensions.

The US is in a demographically favourable position compared to most other advanced countries and is poised to overtake many emerging countries with its positive demographics.<sup>2</sup> Japan and Germany are the oldest and second oldest countries in the world (in terms of median age) but with important demographic differences between them influencing the evolution of their trends. These differences are crucial in understanding the differences that emerge in GDP growth, employment, saving patterns, government balances and other macro economic variables in these countries. We argue that it is not quite right to put these countries in the same basket when assessing their economic prospects.

### Population & Population Growth Differences

US GDP is much higher than that of Japan and Germany as displayed in Exhibit 1. But when we consider the GDP per capita for these three countries, the disparity is not that stark. The much higher population of the US pulls down its GDP per capita making it much closer to that of Japan and Germany.

#### Exhibit 1: GDP Levels, Population Levels and GDP per Capita

GDP levels are in billion US dollars (in current prices), GDP per capita levels are in US dollars (in current prices) and population levels are in thousands -2010

	GDP, current prices Billions US Dollars	GDP per capita, current prices U.S. dollars	Population Thousands
Germany	3333	40679	82057
Japan	5273	41366	126995
United States	14800	47702	317641

Source: Credit Suisse, IMF, UN

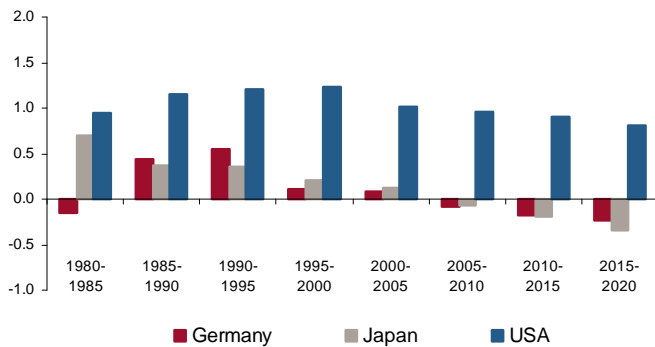
<sup>1</sup> We have compared and contrasted the demographics of European countries in "[European Demographics at the Core: Consumers and Workers](#)", more modernized Asian and Latin American countries in "[The Republic of Korea: Demographic Opportunities and Challenges](#)" as well as developing Asian and Latin American countries in "[Vietnam: Demographics continue to drive long-term growth](#)".

<sup>2</sup> See Credit Suisse Demographics Research, "[US Demographics: Favourably Poised for the Future](#)" (2010).

The US has the highest population growth amongst the three countries as shown in Exhibit 2. In 1980-1985, both the US and Japan had positive and high population growth rates (0.95% p.a. and 0.69% p.a., respectively). However, Japan's population growth rate decreased rapidly while that of the US has risen until 2000 and fell beyond that. Germany experienced negative population growth in 1980-1985, which turned positive thereafter. Currently, the US has a relatively high population growth rate of 0.96% p.a. while both Germany and Japan have begun to experience a fall in population numbers (-0.09% p.a. and -0.07% p.a., respectively, in 2005-2010). This trend is projected to continue in the future having negative implications on the labour supply and GDP growth of Japan and Germany.

**Exhibit 2: Population Growth Rate**

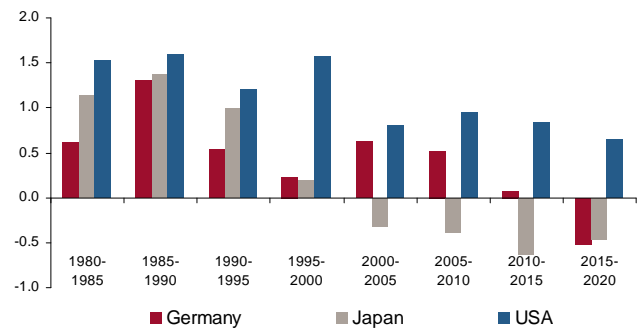
Growth rate per annum (in percent)



Source: Credit Suisse, UN

**Exhibit 3: Labour Force Growth Rate**

Growth rate per annum (in percent)



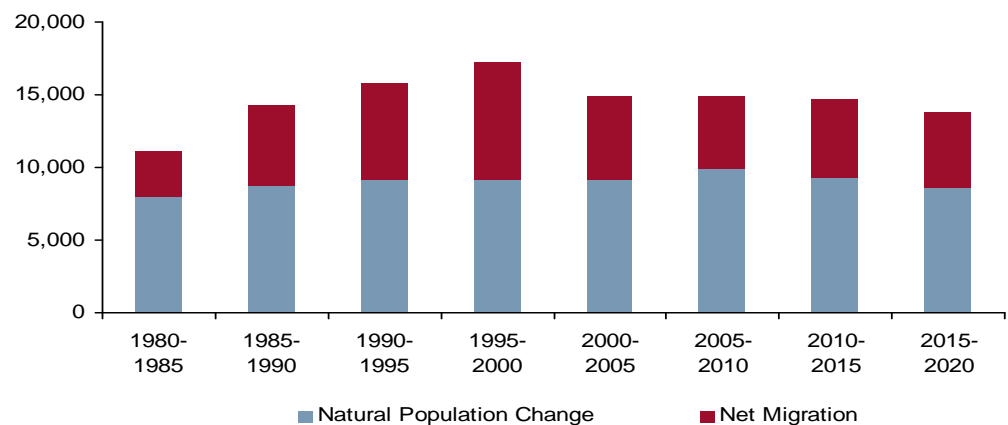
Source: Credit Suisse, ILO

Exhibit 3 shows trends in labour force growth and we see that its pattern closely resembles that of population growth for the US and Japan. However, for Germany we see that the labour force is not projected to fall until 2015 despite falling population. There are two possible reasons for this. Firstly, over this period the International Labor Organization's (ILO) projections suggest that a higher fraction of Germany's falling population will enter the labour force. Also, labour force growth operates with a lag of nearly a decade or two to population growth.

Population change can be decomposed into natural population change (number of births less the number of deaths) and change due to migration. Exhibit 4 shows that immigration along with high positive levels of natural population change contributed to the faster population growth in the US.

**Exhibit 4: Sources of Population Change: USA**

In thousands

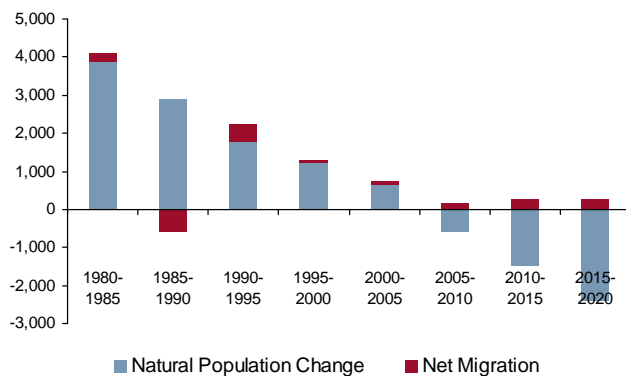


Source: Credit Suisse, UN

In Germany, immigration was large enough to offset the negative natural population change between 1985 and 2005, which led to a positive overall population growth rate during this time period. However since 2005, the negative natural population change was greater than the positive migration contribution. Hence the overall population of Germany started to decline (see Exhibit 5). But in the case of Japan, the migration contribution has been relatively small. Japan's population growth was positive before 2005 because of positive natural population change rather than immigration. Japan's population started to decline in 2005, as natural population change turned negative and immigration was not large enough to offset it (see Exhibit 6). Thus even though Japan and Germany exhibited a similar pattern in terms of population change (Exhibit 2), the sources of population change differ.

**Exhibit 5: Sources of Population Change: Japan**

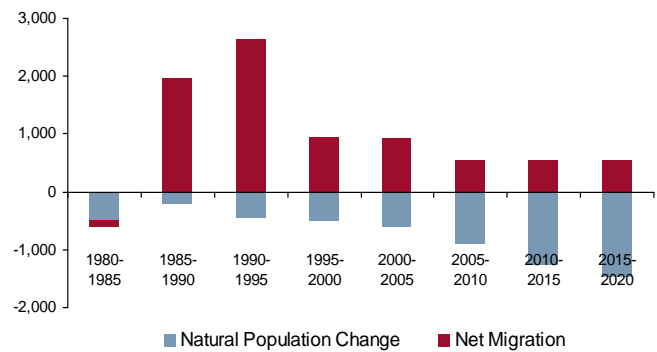
In thousands



Source: Credit Suisse, UN

**Exhibit 6: Sources of Population Change: Germany**

In thousands

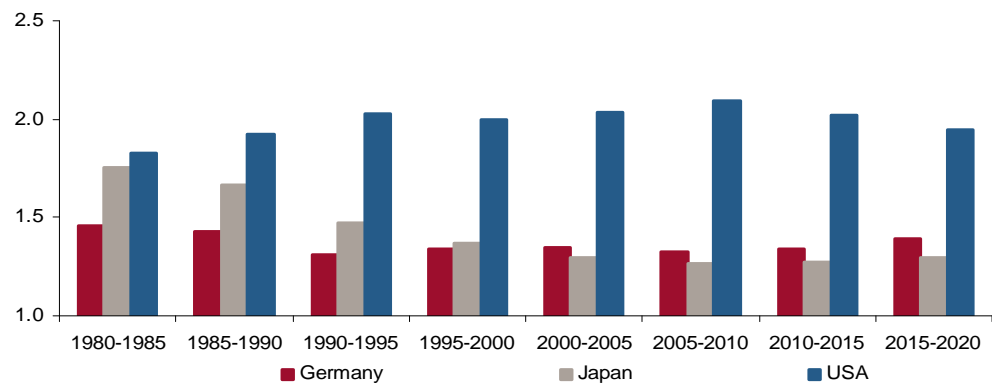


Source: Credit Suisse, UN

Natural population change is influenced by the total fertility rate which refers to the average number of children per woman of child-bearing age. Over 1980-85, both Japan and the US had high fertility rates (1.83 children/woman for the US vs. 1.75 children/woman for Japan). The fertility rate in Japan has exhibited a rapidly declining trend (1.27 children/woman in 2005-2010) with the decline in fertility rate in Germany being less rapid in comparison (1.32 children/woman in 2005-2010) The US fertility rate of 2.09 children/woman (2005-2010) makes it the only large developed country with fertility close to the replacement level of 2.1 children/woman (see Exhibit 7).

**Exhibit 7: Total Fertility Rates**

Children per woman

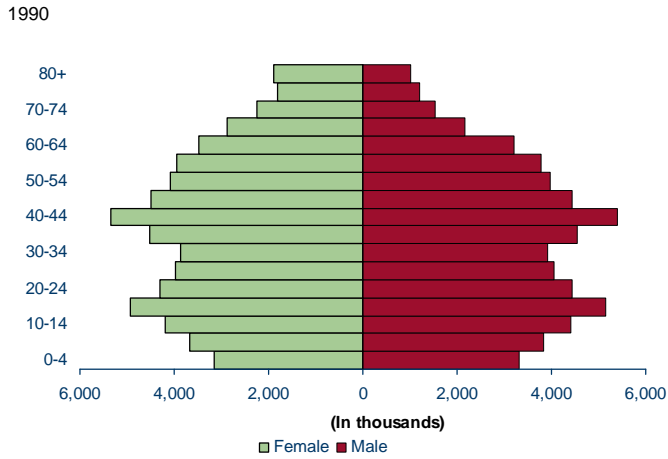


Source: Credit Suisse, UN

The age structure of Japan shown below for 1990 and 2010 looks very different than that of the US today. The population pyramid of Japan has rectangularized with more middle-aged and older people relative to the young.

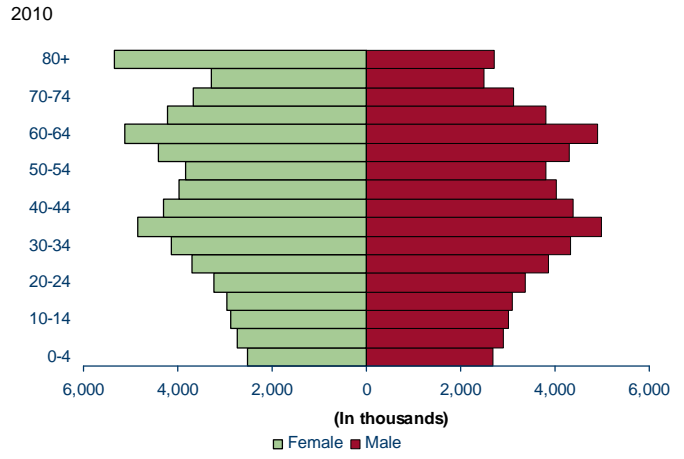
Germany though looks more like Japan today. See Exhibit 8 - Exhibit 11 below.

**Exhibit 8: Population Pyramid: Japan (1990)**



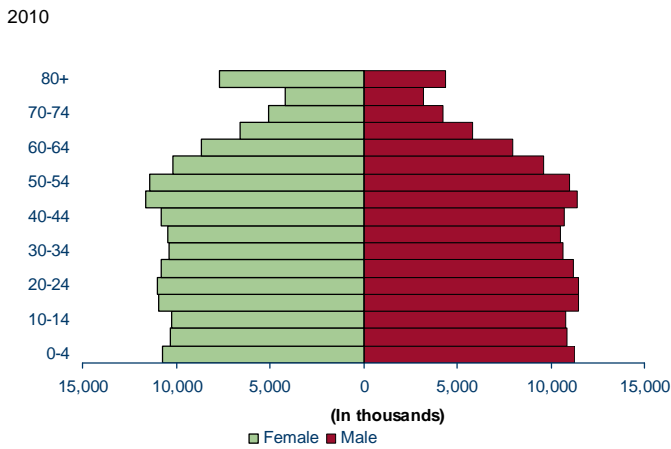
Source: Credit Suisse, UN

**Exhibit 9: Population Pyramid: Japan (2010)**



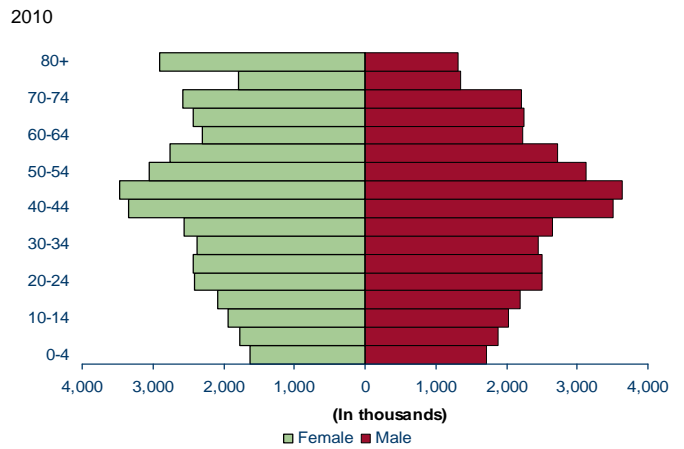
Source: Credit Suisse, UN

**Exhibit 10: Population Pyramid: USA (2010)**



Source: Credit Suisse, UN

**Exhibit 11: Population Pyramid: Germany (2010)**



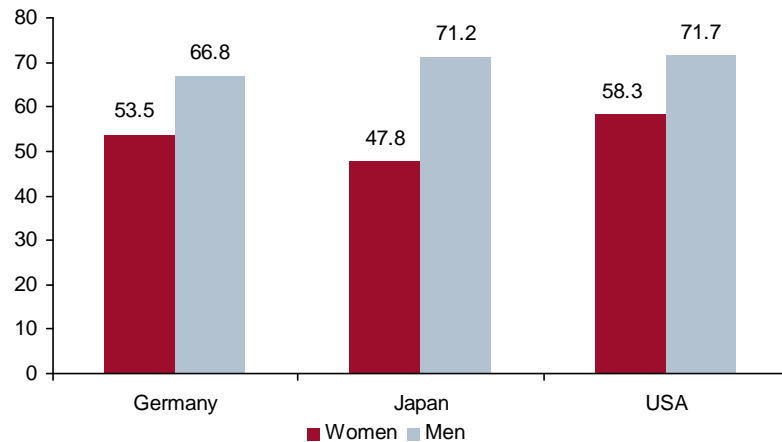
Source: Credit Suisse, UN

## Economic Activity Rates and the Demographic Drivers of GDP Growth

The US labour force is growing rapidly while Japan's labour force is shrinking. Currently the US has a higher total economic activity rate compared to Japan and Germany. Yet, there exists differences in male vs. female economic activity rates of these countries. As Exhibit 12 shows, the gap between male and female economic activity rates is the highest in Japan (23.4%) while Germany and the US have a similar gap (around 13%).

### Exhibit 12: Economically Active Population (by gender)

Rates-2010



Source: Credit Suisse, ILO

As per a growth accounting framework that we adopt, it is useful to decompose real GDP growth<sup>3</sup> into the following components.

- (i) Working-age population growth [growth of (Population aged 15-64 years)]
- (ii) Labour-productivity growth [growth of (Real GDP/Hours Worked)]
- (iii) Labour-utilization growth [growth of (Hours Worked/ Working Age Population)]

Exhibit 13 presents the decomposition of GDP growth into its underlying components for 1990-1999 and 2000-2009.

### Exhibit 13: GDP Growth and its Components (1990-2009)

Average growth rates (%)

	Working Age Population Growth		Labour Productivity Growth		Labour Utilization Growth		Real GDP Growth	
	1990-99	2000-09	1990-99	2000-09	1990-99	2000-09	1990-99	2000-09
USA	1.2	1.1	1.6	2.1	0.3	-1.4	3.1	1.9
Germany	0.2	-0.2	2.3	1.0	-0.6	0.0	1.9	0.8
Japan	0.2	-0.5	2.4	1.7	-1.1	-0.5	1.5	0.7

Source: Credit Suisse, GGDC, UN

<sup>3</sup> See Credit Suisse Demographics Research, "[A Demographic perspective of GDP Growth](#)" (2008) for more details.

We note that labour productivity growth has contributed the most to GDP growth in all the three countries. Working-age population growth was low during 1990-1999 and negative during 2000-2009 in Germany and Japan, which resulted in lower real GDP growth in Germany and Japan than in the US. Another reason for the same was lower labour productivity growth in Germany and Japan compared to the US in 2000-2009. Thus the GDP growth pattern and future outlook of these countries differ driven by the labour force variation. The US has a growing and young labour force that we think will act as an important driver boosting its future GDP growth.

In addition to the above decomposition of drivers of GDP growth, it is illustrative to examine the sectoral decomposition of gross value added (GVA) and employment to get an idea about the relative sector productivity of workers.

We calculated the gross value added per worker employed in each sector in 2008 and found that a worker employed in industry had the highest GVA in all the three countries (USA - 110,450 USD; Germany - 86,842 USD; Japan - 85,262 USD) compared to agriculture and services. In agriculture, the US had higher GVA per worker (69,945 USD) compared to Germany (41,520 USD) and Japan (26,929 USD). The same is true for services, but the gap is much lower across the three countries (USA - 94,252 USD; Germany - 84,168 USD and Japan - 80,417 USD).

## Differences in Consumption and Saving Patterns

Exhibit 14 highlights the expenditures decomposition of GDP in the three countries. The share of household consumption has been the highest in the US and has risen over time.

### Exhibit 14: GDP Breakdown

Share of GDP (%)

	1990			2008		
	USA	Germany	Japan	USA	Germany	Japan
Household Consumption	66.7	57.7	52.5	71.3	53.7	53.5
- Durable Goods	8.4	8.5	5.2	7.5	5.9	4.6
- Semi-Durable Goods	5.7	7.7	6.5	4.8	5.2	4.0
- Non-Durable Goods	16.1	18.3	14.9	16.2	15.4	14.4
- Services	36.6	23.2	26.0	42.8	27.2	30.5
Government Consumption	17.0	19.2	13.4	13.9	18.4	16.7
Investment	17.7	23.1	33.1	19.9	20.5	23.1
Exports	9.6	24.8	10.5	16.2	56.7	20.8
Imports	10.9	24.8	9.5	21.3	49.4	14.0

Source: Credit Suisse, Euromonitor, UN

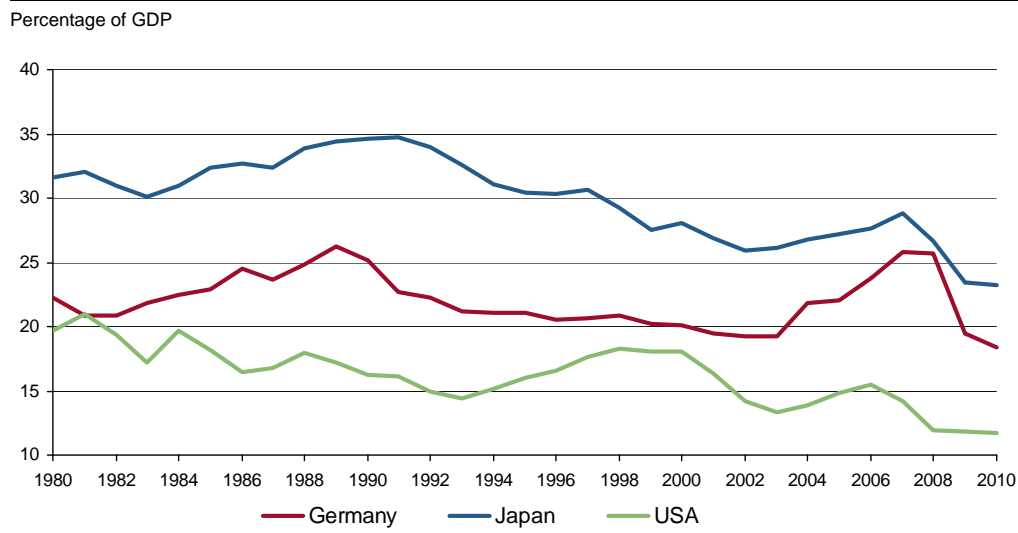
The largest increase has occurred in the share of consumption of services in the US while the share of consumption of durables and semi durables has declined. The share of consumption in Japan is comparatively low and the increase over time has been modest. Germany's consumption share has fallen over time. Private Consumption Expenditures are the largest component of GDP and there are significant differences between US on the one hand and Germany and Japan on the other. These expenditures reflect relative consumer differences across the three countries.

The flipside of consumption is savings and we see in Exhibit 15 that the Japanese savings rate is much higher than that of the US. However, the Japanese savings rate has dropped substantially from a high level of 34.6% in 1990 to 23.5% in 2009. The share of investment in Japan is also the highest amongst the three but has declined rapidly over time. As shown in a previous report<sup>4</sup>, there is a very close relationship between private savings ( $S^P$ ), investment (I), current account (CA) and budget deficit (G - T) given by the equation:

$$S^P = I + CA + (G - T)$$

As we see in Exhibit 14 and Exhibit 15, savings in Japan currently exceed investment leading to a current account surplus. Savings in the US on the other hand are lower than investment leading to a current account deficit. Thus we see that differential demographics of these countries, through their effects on savings and investment, influence and result in varied current account balances. In the case of Germany note the high share of imports and exports as well as their rapid increase over time, along with an overall current account surplus in 2008. The export-led strategy of Germany is very sensible strategy from a demographic viewpoint given the rapidly declining population growth rate (read consumer growth rate) as every individual in the population is a consumer.

### Exhibit 15: Gross Savings Rate



Source: Credit Suisse, IMF

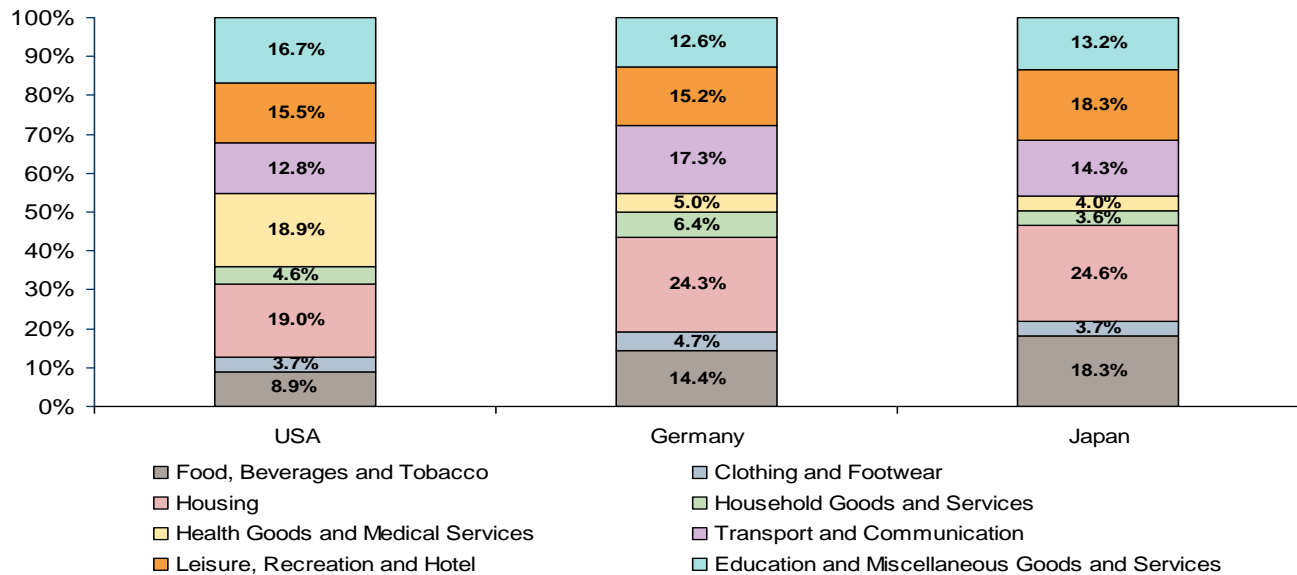
Consumption differences can be better understood when we look at household structure trends which are presented in the Appendix (Exhibit 22-Exhibit 27). The current family structure is dominated by one and two people households (59% in Japan, 60% in the US and 73% in Germany). For all three countries, changes in household size have occurred over time. In Japan, we see a major increase in the share of one person and two people households (from 43% in 1990 to 60% in 2010) with a significant reduction in share of 4+ people households (from 39% in 1990 to 23% in 2010). A similar trend is noticeable in Germany. In the US, family size changes have not been that drastic.

<sup>4</sup> See Credit Suisse Demographics Research, "[Demographics, Capital flows and Exchange Rates](#)" (2007).



**Exhibit 16: Consumption Expenditure by Major Groups**

Share of Total Consumption Expenditure – 2009



Source: Credit Suisse, Euromonitor

The changes in family size over time as well as the differences across countries have an impact on the composition of consumption expenditures. Exhibit 16 shows the share of different categories in the consumption expenditures of the US, Japan and Germany. Housing had the highest share in consumption expenditure in 2009 while clothing and footwear had the lowest share (in Japan household goods and services also has a small share). The share of housing in the US is lower than that in Germany and Japan while the share of health goods and services is drastically higher compared to Germany and Japan.

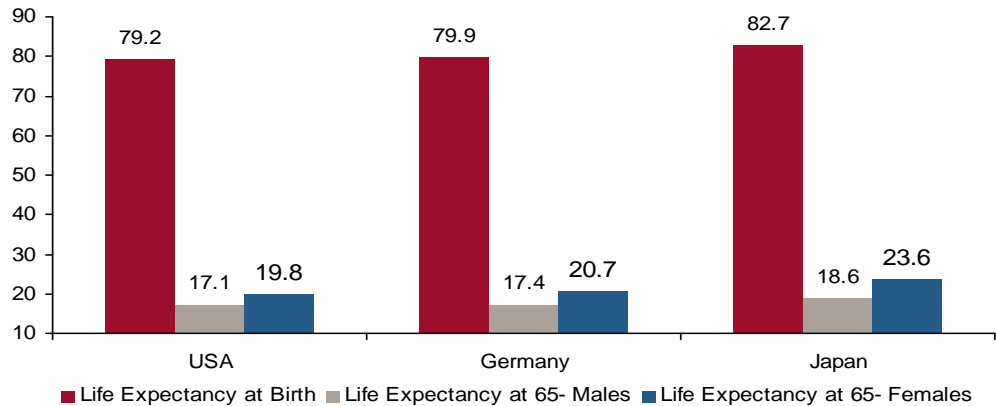
The consumption patterns of the elderly in the three countries are similar to the overall consumption patterns, except in the US where the elderly spend the highest share of total consumption expenditure on health goods and services (32.5%) rather than on housing (15.3%) in 2007. As a result, the disparity between the share of health spending across the three countries is much higher for the elderly. Total health expenditures in the US were 16% of GDP in 2007 with the private expenditures component 8.7% of GDP. In Germany, the private health expenditures component was 2.4% out of a total of 10.4% of GDP.

**Longevity, Pensions and Living Conditions of the Elderly**

Despite spending a large share on health goods and medical services, the US has a low life expectancy at birth compared to Japan and Germany. The trend of increasing life expectancy at birth is common to all three countries. Japan’s life expectancy today is higher than that in Germany and the US and is projected to be in the future Conditional life expectancy, i.e., life expectancy at age 65 is also the highest in Japan and the lowest in the US as shown in Exhibit 17.

**Exhibit 17: Life Expectancy at Birth and Life Expectancy at Age 65**

Years- Data for Life Expectancy at birth is for 2005-2010 and life expectancy at age 65 is for 2007



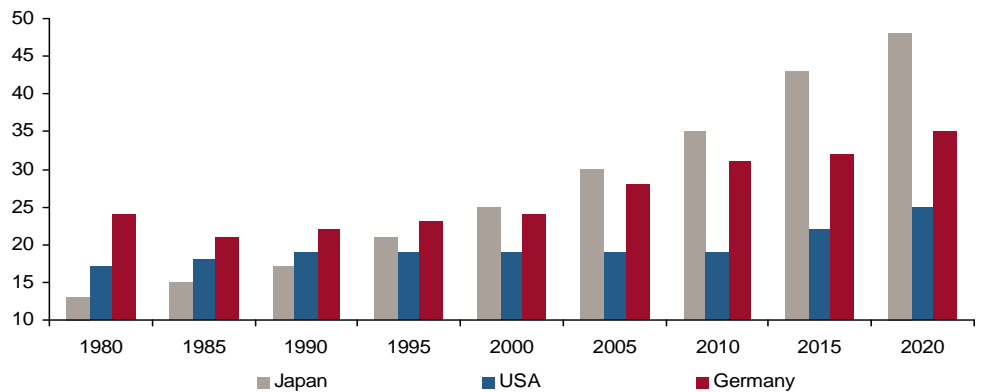
Source: Credit Suisse, UN, OECD

The gap between life expectancy and average effective age of retirement gives us the number of years that are spent in retirement. In rich countries, life expectancy has been rising and effective retirement age falling, thereby increasing the gap. In 2006 the male gap in Germany was 15.1 years followed by the US, 10.6 years, and Japan, 9.7 years. The gap for females was higher in Germany at 21.4 years; Japan at 19.5 years and the US at 16.9 years. This is because female life expectancy is always higher than male in all developed countries and in most cases their retirement age is lower.

Japan has a high effective age of retirement which is consistent with its high economic activity rate at older ages. In 2010, the economic activity rate for those aged 65+ is the highest in Japan (19%) followed by the US (17.6%) and Germany (4.1%). The high life expectancy has created a large number of old dependants in Japan. In 1980 Japan had the lowest old-age dependency ratio (13) compared to the US (17) and Germany (24). It experienced a very rapid increase in the number of old dependants and overtook the US in 1995 and Germany in 2000. Currently it has 35 old-age dependants per 100 people of working age compared to 31 in Germany and 19 in the US. In 2020, this ratio is projected to increase to 48 (see Exhibit 18).

**Exhibit 18: Old-Age Dependency Ratio**

People aged 65+/100 people aged 15-64 years

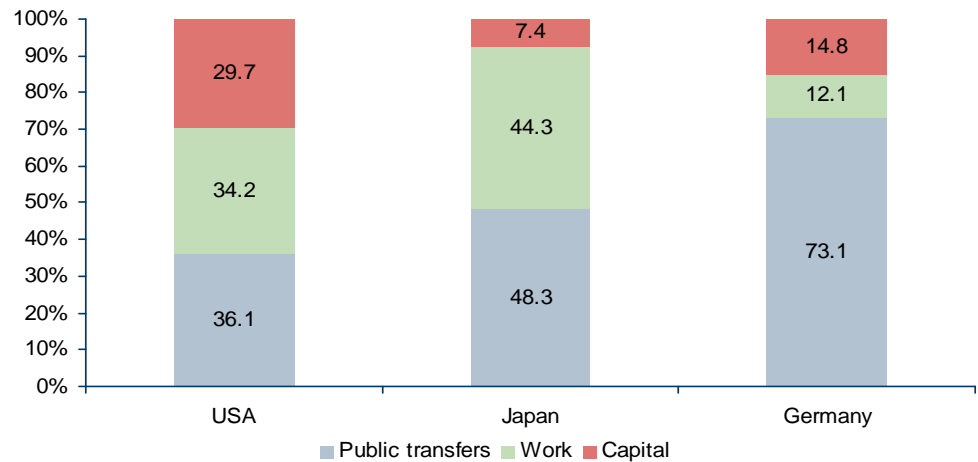


Source: Credit Suisse, UN

The economic status and the living conditions of the elderly in these countries can be compared by looking at the relative incomes of older people. For people aged between 66 and 75 years, Germany had the highest relative income (96.29% of equivalent household disposable income) in the mid 2000s followed by the US (95.66%) and Japan (88.45%). For those aged 75 years and above, the rankings change with Germany still the highest (85.5%) followed by Japan (84.22%) and the US (75.75%). The sources of income of the elderly also differ considerably amongst these countries as shown in Exhibit 19.

**Exhibit 19: Sources of incomes of older people**

Percentage of household disposable income, mid-2000



Source: Credit Suisse, OECD

The elderly in the US derive a roughly equal share from the three sources. In Japan significant proportions come from public transfers and work while the contribution of capital is minor. In Germany, public transfers form a very considerable part of elderly income while work and capital contribute very little. This is because pension wealth (the total value of lifetime flow of pension incomes), which measures the generosity of pension systems, is the highest in Germany amongst the three countries as shown in Exhibit 20.

**Exhibit 20: Gross Pension Wealth for the Average Earner**

Multiple of gross annual individual earnings

	Men	Women
Germany	7.2	8.5
Japan	5.6	6.3
USA	5.5	6.4

Source: Credit Suisse, OECD

We had shown in a previous report that the ageing of the population affects the fiscal balances of the government, leading to large fiscal strains and unsustainable finances.<sup>5</sup> Even though government budgets are a common source of concern in all the major developed countries today, differences exist in the relative positions as shown in Exhibit 21.

**Exhibit 21: Gross Government Debt and Gross Debt per Capita**

Gross Government Debt is expressed as a percentage of GDP and Gross Debt per capita levels are in US dollars

	Gross Debt			Gross Debt per Capita
	1994-2003	2005	2009	2009
	(Percentage of GDP)			(US Dollars)
Germany	58.6	68.0	72.5	29,583
USA	63.3	61.6	83.2	37,696
Japan	125.9	191.1	217.6	86,729

Source: Credit Suisse, IMF, UN

<sup>5</sup> See Credit Suisse Demographics Research, "A Demographic Perspective of Fiscal Sustainability: Not Just the Immediate Term Matters" (Feb 2010)

Japan fares the worst in terms of gross debt as a percentage of GDP. It also has the highest figure of gross debt per capita. The US and Germany in comparison have lower levels of gross debt and therefore it is inaccurate to draw analogies between the positions of the three countries.

## Conclusion

Based on the demographic comparisons of the US, Germany and Japan we have illustrated significant differences across these countries currently as well as in the past. The dimensions along which they differ include the following: population, population growth, GDP per capita, age structure, old-age dependency ratio, labour force growth rate, household structure, fertility rates and life expectancy etc. These translate into very different implications for consumers, workers and governments as well as for economic growth and fiscal deficit/debt burdens.

We strongly advise against broad parallels across Japan, US and Germany without carefully considering the largest components of GDP on the expenditure side (consumer expenditures) and working-age population growth on the supply side of aggregate output (GDP).

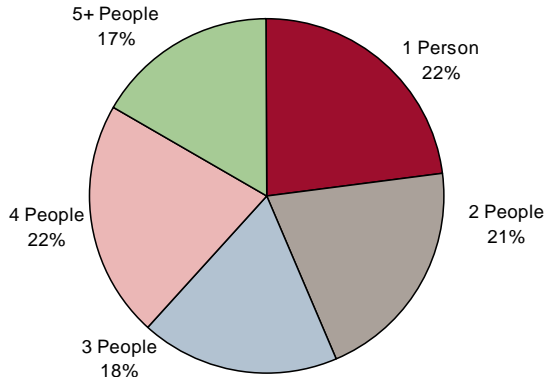
## Acknowledgements

We acknowledge research inputs and comments from Liyan Shi.

Appendix

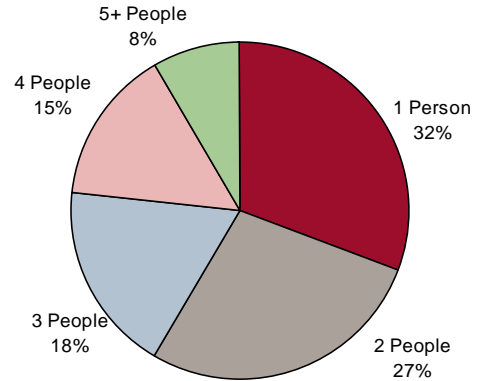
**Exhibit 22: Household Size: Japan**

1990



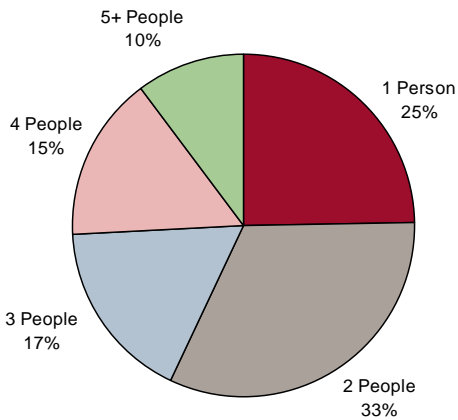
**Exhibit 23: Household Size: Japan**

2009



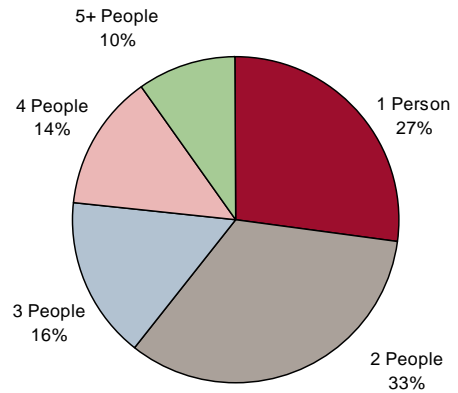
**Exhibit 24: Household Size: USA**

1990



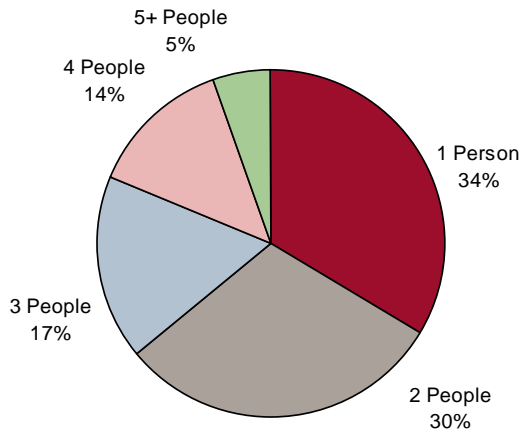
**Exhibit 25: Household Size: USA**

2009



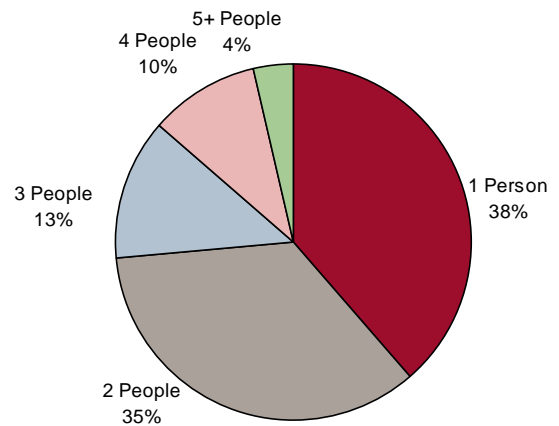
**Exhibit 26: Household Size: Germany**

1990



**Exhibit 27: Household Size: Germany**

2009



Source: Credit Suisse, Euromonitor

Source: Credit Suisse, Euromonitor

## GLOBAL DEMOGRAPHICS RESEARCH

### LONDON

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**Amlan Roy, Director**

+44 20 7888 1501  
amlan.roy@credit-suisse.com

**Sonali Punhani, Analyst**

+44 20 7883 4297  
sonali.punhani@credit-suisse.com

## Disclosure Appendix

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