How demographic change causes inflation to rise

Dr. Jörg Krämer
Tel: +49 69 136 23650

Unlike in the six decades after World War II, the share of the working-age population will decline significantly in many economically important countries from now on. We analyse the interplay between demography and monetary policy and outline the contribution of demographic change to a pick-up in inflation.

Demographic change causes decline of labour supply

Charles Goodhart, a professor emeritus at the London School of Economics, was an independent member of the Monetary Policy Committee of the Bank of England from 1997 to 2000. He belongs to the monetary policy establishment, which in Western countries usually stresses that inflation is not a threat and that monetary policy can therefore remain loose for longer. It is therefore all the more remarkable that Goodhart, in his book published in 2020 together with Manoj Pradhan, emphasises that a great demographic reversal poses the risk of significantly higher inflation. The focus of his argument is the share of the working age population (14 to 64 years) in the total population. Having risen since the Second World War, this share will fall from now on. This will reduce the supply of labour in the future and thus drive up wage costs and inflation.

Goodhart does not focus on the global working age population, but on those world regions that are largely integrated into the international division of labour. Thus, it is about North America, Europe, Asia and Australia. While the share of the working-age population in these regions was 61.6% in 1950, it had risen to 67.6% by 2015 (front page chart). It is true that the share of pensioners in the total population has increased over this period due to rising life expectancy, which in itself speaks for a lower labour force potential. But the share of young people (0 to 14 years) has fallen faster because of the declining birth rate, so that the share of the working-age population has risen (chart 1). This demographic trend, which has lasted for more than six decades, has been reinforced in its inflation-dampening effect since the 1980s by the fact that the rising labour force of China and other Asian countries became integrated in the global economy.

Chart 1 - Declining share of younger people no longer compensates for increase in the share of the old

Source: UN, Commerzbank Research

However, the trend towards an increasing share of the working population came to an end around 2015. Since then, the number of old people is no longer rising more slowly than the number of young people is falling. This is helped by the fact that the baby boomer generation is retiring. In the coming decades, the share of those able to work should continue to fall significantly – and at a similar rate at which it had risen in the six decades after the Second World War. We are witnessing a demographic turning point.
China is no exception

This trend reversal affects not only Western countries but also China, whose population is even somewhat bigger than North America’s and Europe's combined.

In China, the working-age population has already been declining since 2010, and as a result of the former one-child policy and the desire of young couples to have a small family, it is likely to decline as sharply as in Germany in the coming decades. In addition, the reservoir of Chinese migrant workers has been exhausted. Their numbers are no longer growing (chart 2).

Chart 2 - Fewer migrant workers for the first time in Corona year 2020

Migrant workers, in million

Source: WIND, Commerzbank Research

A falling labour supply causes inflation to rise ...

Charles Goodhart points out that the great demographic reversal tends to raise inflation. This seems plausible because a declining share of the labour force is indicative of labour shortages and rising labour costs. Ultimately, we believe in the inflationary nature of the demographic reversal. But the correlation does not always hold. One only has to think of the 1970s, which were characterised by high inflation even though the labour force in Western countries grew faster than the total population. Obviously, there are other factors such as monetary policy that also play a role. According to economist Milton Friedman, inflation in the long run is even determined exclusively by the money supply.

... if central banks react incorrectly

The price level or inflation in an economy cannot be explained by one factor alone, such as demography, but by the interaction of aggregate demand and supply. Let us assume that the population remains constant and the per capita consumption of the individual age groups is identical. Then aggregate demand does not change if the share of the working-age population decreases. However, aggregate supply decreases because fewer people are available to produce goods and services. If the lower supply is met by an unchanged demand, inflation will rise.

However, the central bank could react to the demographically induced lower supply of goods and services by lowering money supply growth. Then aggregate demand fits supply and inflation does not pick up.

If one nevertheless expects the demographic reversal to cause inflation to rise in the coming decades, one must implicitly assume that the central banks are systematically reacting wrongly by ignoring demographic factors. If they did, inflation would indeed pick up significantly, as empirical studies show.

Empirical study: Strong influence of demography on inflation

In 2018, the Bank for International Settlements (BIS) published a study demonstrating the significant impact of demographic factors on inflation. The BIS looks at data for 22 countries from 1870 onwards, and in addition to demographic factors, it also considers the stance of monetary policy to capture influences beyond demographics. The results confirm that a declining share of working-age cohorts causes inflation to rise markedly, holding other factors constant. For the average of the coming decades, the authors estimate that demography...
increases inflation by 3 percentage points per year on its own. The inflationary effect would thus be similar to the disinflationary effect observed between 1970 and 2010.

**Inflation is likely to rise in the long term, ...**

The relative decline in the working-age population is in itself an argument for inflation to rise in the long run. Indeed, we do not expect central banks to respond adequately to the foreseeable demographic deterioration in the supply side of their economies:

- Some of the states are as heavily indebted as they were at the end of the Second World War. Politicians are therefore likely to put great pressure on the central banks to continue to pursue a loose monetary policy. This is especially true for the euro area. There, highly indebted countries like Italy are not addressing the causes of their economic problems, which latently threatens the stability of the monetary union and limits the ECB’s room for manoeuvre.

- A relative decline in the working-age population means a shortage of labour. Real wages thus increase at the expense of real pensions. This distributional conflict could be concealed with higher inflation, because pensioners can then at least look forward to nominally rising old-age pensions. In this respect, politicians may also push for a loose monetary policy.

All in all, there are important arguments in favour of the great demographic reversal raising inflation. However, this effect could be delayed if more populous countries, for example from Africa, integrate into the global economy, even if the economic policy changes necessary for this are not yet apparent on a broad scale.

**... but moderately rising wages are still keeping inflation in check**

For the next two to three years, inflation is likely to be dominated by labour costs anyway, which in turn depend on the labour market situation and inflation expectations. At least in the euro area, the labour market situation is likely to remain difficult for the time being due to the effects of the Corona crisis. Accordingly, there is no evidence of a sustained faster rise in labour costs. The currently more rapidly rising producer costs probably do not yet mark the beginning of permanently higher inflation. We would expect real inflation problems to start only in a couple of years.

**Further studies on the topic of inflation**

- Higher inflation – only an outlier? Week in Focus, 21 May 2021.
- Are higher timber and metal prices pushing up inflation?, Week in Focus, 7 May 2021.
- Inflation – Japan is no blueprint for the West, Week in Focus, 23 April 2021.
Research contacts (E-Mail: firstname.surname@commerzbank.com)

<table>
<thead>
<tr>
<th>Economic Research</th>
<th>Interest Rate &amp; Credit Research</th>
<th>FX &amp; EM Research</th>
<th>Commodity Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Jörg Krämer (Head)</td>
<td>Christoph Rieger (Head)</td>
<td>Ulrich Leuchtmann (Head)</td>
<td>Eugen Weinberg (Head)</td>
</tr>
<tr>
<td>+49 69 136 23650</td>
<td>+49 69 136 87664</td>
<td>+49 69 136 23393</td>
<td>+49 69 136 43417</td>
</tr>
<tr>
<td>Dr Ralph Solveen (Deputy Head; Germany)</td>
<td>Michael Leister (Head Rates)</td>
<td>Thu-Lan Nguyen (G10)</td>
<td>Daniel Briesemann</td>
</tr>
<tr>
<td>+49 69 136 22322</td>
<td>+49 69 136 21264</td>
<td>+49 69 136 82878</td>
<td>+49 69 136 29158</td>
</tr>
<tr>
<td>Dr Christoph Balz (USA, Fed)</td>
<td>Rainer Guntermann</td>
<td>Antje Praefcke (G10)</td>
<td>Carsten Fritsch</td>
</tr>
<tr>
<td>+49 69 136 24889</td>
<td>+49 69 136 87506</td>
<td>+49 69 136 43834</td>
<td>+49 69 136 21006</td>
</tr>
<tr>
<td>Dr Michael Schubert (ECB)</td>
<td>Cem Keltek</td>
<td>Esther Reichelt (G10)</td>
<td>Dr Michaela Kuhl</td>
</tr>
<tr>
<td>+49 69 136 22700</td>
<td>+49 69 136 87685</td>
<td>+49 69 136 41505</td>
<td>+49 69 136 29363</td>
</tr>
<tr>
<td>Eckart Tuchtfeld (German economic policy)</td>
<td>Ted Packmohr (Head Covered Bonds and Financials)</td>
<td>Lutz Karpowitz (EM)</td>
<td>Barbara Lambrecht</td>
</tr>
<tr>
<td>+49 69 136 23888</td>
<td>+49 69 136 87571</td>
<td>+49 69 136 42152</td>
<td>+49 69 136 22295</td>
</tr>
<tr>
<td>Dr Marco Wagner (Germany, Italy)</td>
<td>Marco Stoeckle (Head Corporate Credit)</td>
<td>Elisabeth Andreae (EM)</td>
<td>Cross Asset Strategy</td>
</tr>
<tr>
<td>+49 69 136 84335</td>
<td>+49 69 136 82114</td>
<td>+49 69 136 24052</td>
<td>Alexander Krämer</td>
</tr>
<tr>
<td>Bernd Weidensteiner (USA, Fed)</td>
<td>+49 69 136 24527</td>
<td>Tatha Ghose (EM)</td>
<td>+49 69 136 22982</td>
</tr>
<tr>
<td>Christoph Weil (Euro area, France, Switzerland)</td>
<td>+49 69 136 24041</td>
<td>+44 20 7475 8399</td>
<td>Andreas Hürkamp (Equity Strategy)</td>
</tr>
<tr>
<td>+65 6311 0166</td>
<td>+49 69 136 82114</td>
<td>Charlie Lay (EM)</td>
<td>+49 69 136 45925</td>
</tr>
<tr>
<td>Hao Zhou (EM)</td>
<td></td>
<td>You-Na Park (EM)</td>
<td>Markus Wallner (Equity Strategy)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+49 69 136 42155</td>
<td>+49 69 136 21747</td>
</tr>
</tbody>
</table>

Other publications (examples)

**Economic Research:**
- Economic Briefing (up-to-date comment on main indicators and events)
- Economic Insight (detailed analysis of selected topics)
- Economic and Market Monitor (chart book presenting our monthly global view)

**Commodity Research:**
- Commodity Daily (up-to-date comment on commodities markets)
- Commodity Spotlight (weekly analysis of commodities markets and forecasts)

**Interest Rate & Credit Research:**
- Ahead of the Curve (flagship publication with analysis and trading strategy for global bond markets)
- European Sunrise (daily comment and trading strategy for euro area bond markets)
- Rates Radar (ad-hoc topics and trading ideas for bond markets)
- Covered Bonds Weekly (weekly analysis of the covered bonds markets)
- Credit Note (trading recommendations for institutional investors)

**FX Strategy:**
- Daily Currency Briefing (daily comment and forecasts for FX markets)
- FX Hot Spots (ad hoc analysis of FX market topics)

**Equity Markets Strategy:**
- Share[d] Reviews (monthly and quarterly equity market review of market catalysts, performance trends and economic indicators)
- Digging in Deutschland (thematic research focusing on the German equity market)

**Cross Asset:**
- Cross Asset Monitor (weekly market overview, incl. sentiment and risk indicators)
- Cross Asset Outlook (monthly analysis of global financial markets and tactical asset allocation)
- Cross Asset Feature (special reports on cross-asset themes)

To receive these publications, please ask your Commerzbank contact.
In accordance with ESMA MAR requirements this report was completed 28/5/2021 08:53 CEST and disseminated 28/5/2021 08:53 CEST.

This document has been created and published by the Group Research department (GM-R) within the Group Management division of Commerzbank AG, Frankfurt/Main or Commerzbank’s branch offices mentioned in the document. Commerzbank AG is a provisionally registered swap dealer with the CFTC.

If this report includes an analysis of one or more equity securities, please note that the author(s) certify that (a) the views expressed in this report accurately reflect their personal views; and (b) no part of their compensation was, is, or will be directly or indirectly related to the specific recommendation(s) or views expressed by them contained in this document. The research analyst(s) named on this report are not registered / qualified as research analysts with FINRA. Such research analyst(s) may not be associated persons of Commerz Markets LLC and therefore may not be subject to FINRA Rule 2241 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

It has not been determined in advance whether and in what intervals this document will be updated. Unless otherwise stated current prices refer to the most recent trading day’s closing price or spread which may fluctuate.

Conflicts of interest
Disclosures of potential conflicts of interest relating to Commerzbank AG, its affiliates, subsidiaries (together “Commerzbank”) and its relevant employees with respect to the issuers, financial instruments and/or securities forming the subject of this document valid as of the end of the month prior to publication of this document:

Please refer to the following link for disclosures on companies included in compendium reports or disclosures on any company covered by Commerzbank analysts: https://commerzbank.bluematrix.com/sealside/Disclosures.action

*Updating this information may take up to ten days after month end.

Disclaimer
This document is for information purposes only and does not take into account specific circumstances of any recipient. The information contained herein does not constitute the provision of investment advice. It is not intended to be and should not be construed as a recommendation, offer or solicitation to acquire, or dispose of, any of the financial instruments and/or securities mentioned in this document and will not form the basis or a part of any contract or commitment whatsoever. Investors should seek independent professional advice and draw their own conclusions regarding suitability of any transaction including the economic benefits, risks, legal, regulatory, credit, accounting and tax implications.

The information in this document is based on public data obtained from sources believed by Commerzbank to be reliable and in good faith, but no representations, guarantees or warranties are made by Commerzbank with regard to accuracy, completeness or suitability of the data. Commerzbank has not performed any independent review or due diligence of publicly available information regarding an unaffiliated reference asset or index. The opinions and estimates contained herein reflect the current judgement of the author(s) on the date of this document and are subject to change without notice. The opinions do not necessarily correspond to the opinions of Commerzbank. Commerzbank does not have an obligation to update, modify or amend this document or to otherwise notify a reader thereof in the event that any matter stated herein, or any opinion, projection, forecast or estimate set forth herein, changes or subsequently becomes inaccurate.

This communication may contain trading ideas where Commerzbank may trade in such financial instruments with customers or other counterparties. Any prices provided herein (other than those that are identified as being historical) are indicative only, and do not represent firm quotes as to either size or price. The past performance of financial instruments is not indicative of future results. No assurance can be given that any financial instrument or issuer described herein would yield favourable investment results. Any forecasts or price targets shown for companies and/or securities discussed in this document may not be achieved due to multiple risk factors including without limitation market volatility, sector volatility, corporate actions, the unavailability of complete and accurate information and/or the subsequent transpiration that underlying assumptions made by Commerzbank or by other sources relied upon in the document were inapposite.

Commerzbank and or its affiliates may act as a market maker in the instrument(s) and or its derivative that has been mentioned in our research reports. Employees of Commerzbank and or its affiliates may provide written or oral commentary, including trading strategies, to our clients and business units that may be contrary to the opinions conveyed in this research report. Commerzbank may perform or seek to perform investment banking services for issuers mentioned in research reports.

Neither Commerzbank nor any of its respective directors, officers or employees accepts any responsibility or liability whatsoever for any expense, loss or damages arising out of or in any way connected with the use of all or any part of this document.

Commerzbank may provide hyperlinks to websites of entities mentioned in this document, however the inclusion of a link does not imply that Commerzbank endorses, recommends the purchase or sale of any material on the linked page or accessible from it. Commerzbank does not accept responsibility whatsoever for any such material, nor for any consequences of its use.

This document is for the use of the addressees only and may not be reproduced, redistributed or passed on to any other person or published, in whole or in part, for any purpose, without the prior, written consent of Commerzbank. The manner of distributing this document may be restricted by law or regulation in certain countries, including the United States. Persons into whose possession this document may come are required to inform themselves about and to observe such restrictions. By accepting this document, a recipient hereof agrees to be bound by the foregoing limitations.

Additional notes to readers in the following countries:

Germany: Commerzbank AG is registered in the Commercial Register at Amtsgericht Frankfurt under the number HRB 32000. Commerzbank AG is supervised by both the German regulator, Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), Grauhennderstrasse 108, 53177 Bonn, Marie-Curie-Strasse 24-28, 60439 Frankfurt am Main and the European Central Bank, Sonnemannstrasse 20, 60314 Frankfurt am Main, Germany.

United Kingdom: This document has been issued or approved for issue in the United Kingdom by Commerzbank AG London Branch. Commerzbank AG, London Branch is authorised and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and the European Central Bank. Authorised by the Prudential Regulation Authority and with deemed variation of permission. Subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorisation, are available on the Financial Conduct Authority's website. This document is directed exclusively to eligible counterparties and professional clients. It is not directed to retail clients. No persons other than an eligible counterparty or a professional client should read or rely on any information in this document. Commerzbank AG, London Branch does not deal for or advise or otherwise offer any investment services to retail clients.

United States: This document has been approved for distribution in the US under applicable US law by Commerz Markets LLC ("CMLLC"), a wholly owned subsidiary of Commerzbank AG and a US registered broker-dealer. Any securities transaction by US persons must be effected with CMLLC. Under applicable US law, information regarding clients of CMLLC may be distributed to other companies within the Commerzbank group. This research report is intended for distribution in the United States solely to “institutional investors” and “major US institutional investors,” as defined in Rule 15a-6 under the Securities Exchange Act of 1934. CMLLC is a member of FINRA and SIPC. Banking services in the US, will be provided by Commerzbank AG, New York Branch. Securities activities in the US are conducted through CMLLC and swap transactions with Commerzbank AG. Commerzbank AG is not a member of SIPC and is a provisionally registered swap dealer with the CFTC. Any derivatives transaction with US persons must be effected in accordance with the provisions of the Dodd-Frank Wall Street Reform and Consumer Protection Act. Some products or services may be unavailable in the United States.

Canada: The information contained herein is not, and under no circumstances is to be construed as, a prospectus, an advertisement, a public offering, an offer to sell securities described herein, solicitation of an offer to buy securities described herein, in Canada or any province or territory thereof. Any offer or sale of the securities described herein in Canada will be made only under an exemption from the requirements to file a prospectus with the relevant Canadian securities regulators and only by a dealer properly registered under applicable securities laws or, alternatively, pursuant to an exemption from the dealer registration requirement in the relevant
province or territory of Canada in which such offer or sale is made. Under no circumstances is the information contained herein to be construed as investment advice in any province or territory of Canada and is not tailored to the needs of the recipient. In Canada, the information contained herein is intended solely for distribution to Permitted Clients (as such term is defined in National Instrument 31-103) with whom Commerz Markets LLC deals pursuant to the international dealer exemption. To the extent that the information contained herein references securities of an issuer incorporated, formed or created under the laws of Canada or a province or territory of Canada, any trades in such securities may not be conducted through Commerz Markets LLC. No securities commission or similar regulatory authority in Canada has reviewed or in any way passed upon these materials, the information contained herein or the merits of the securities described herein and any representation to the contrary is an offence.

**European Economic Area:** Where this document has been produced by a legal entity outside of the EEA, the document has been re-issued by Commerzbank AG, London Branch for distribution into the EEA. Commerzbank AG, London Branch is authorised and regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and the European Central Bank. Authorised by the Prudential Regulation Authority and with deemed variation of permission. Subject to regulation by the Financial Conduct Authority Limited regulation by the Prudential Regulation Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorisation, are available on the Financial Conduct Authority’s website.

**Switzerland:** This is an advertisement in the meaning of FIDLEG. The financial instruments mentioned in this publication do not constitute a participation in a collective investment scheme in the sense of the Swiss Collective Investment Schemes Act (CISA). This publication, the information contained herein as well as any other publication in connection with the financial instruments mentioned herein may be distributed exclusively to qualified investors as defined in the CISA and may only be made available to such qualified investors.

**Singapore:** This document is furnished in Singapore by Commerzbank AG, Singapore branch. It may only be received in Singapore by an institutional investor or an accredited investor as respectively defined in section 4A of the Securities and Futures Act, Chapter 289 of Singapore (“SFA”) pursuant to section 274 or section 275 (as applicable) of the SFA. Nothing in this document constitutes accounting, legal, regulatory, tax, financial or other advice and/or recommendations to the recipient of this communication. Further, the communication/information provided herein does not constitute a “financial advisory service” within the meaning of the Financial Advisers Act, Chapter 110 of Singapore (“FAA”) and therefore, the regulatory requirements and duties that may be owed to a client pursuant to or in connection with the FAA are not applicable to the recipient in connection with this communication. Recipients are advised to seek independent advice from their own professional advisers about the information contained herein.

**Hong Kong:** This document, may only be made available in Hong Kong by Commerzbank AG, Hong Kong Branch to ‘professional investors’ within the meaning of the Securities and Futures Ordinance (Cap.571) of Hong Kong and any rules made there under, and persons whose ordinary business is to buy or sell shares or debentures.

**Japan:** This information and its distribution do not constitute and should not be construed as a “solicitation” under the Financial Instrument Exchange Act (FIEA). This information may be distributed from Commerzbank international branches outside Japan solely to "professional investors" as defined in Section 2(31) of the FIEA and Section 23 of the Cabinet Ordinance Regarding Definition of Section 2 of the FIEA. Please note that Commerzbank AG, Tokyo Branch has not participated in its preparation. The instruments recommended in this report cannot be introduced by the Branch. You should contact the Corporate Clients division of Commerzbank AG for inquiries on availability of such instruments.

**Australia:** Commerzbank AG does not hold an Australian financial services licence. This document is being distributed in Australia to wholesale customers pursuant to an Australian financial services licence exemption for Commerzbank AG under Class Order 04/1313. Commerzbank AG is regulated by Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) under the laws of Germany which differ from Australian laws.

**People’s Republic of China (PRC):** This document is furnished by Commerzbank AG and is only intended for institutions that are eligible for financial transactions. No-one else may rely on any information contained within this document. Any derivative transactions by PRC persons may only be entered into by PRC financial institutions which are permitted to conduct derivatives business in the PRC and have obtained all necessary regulatory approvals in the PRC.

© Commerzbank AG 2021. All rights reserved. Version 21.01