



AFRICA AUTOMATION FAIR

AFRICA'S LARGEST SHOWCASE OF INDUSTRIAL
AUTOMATION AND SMART CONTROL TECHNOLOGIES

2019

www.africaautomationfair.com

connected
industries
CONFERENCE

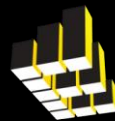




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African solutions to disruptive technologies and a little economics

Automation, connection, disruptive technologies and our working lives

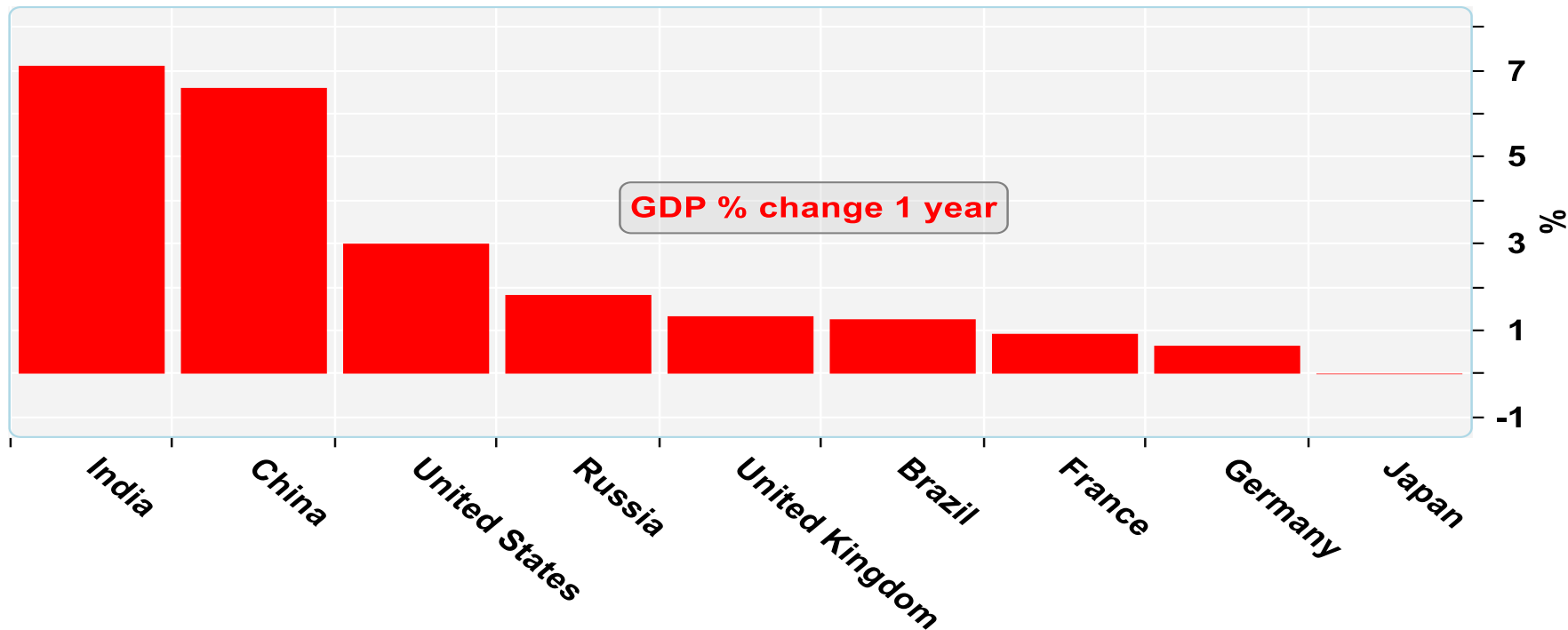
Automation and disruptive technologies

- **Context international**
 - World economy and the near future.
- **Mega trends.**
 - Wealth, poverty, age and skills.
- **Automation, connection and innovation indicators.**
- **Focus on Skills, education and income**
 - World, Africa and SA
 - A little on a sector or two on innovation in SA..
- **A normal forecast or two.**



India and China race ahead while others struggle.

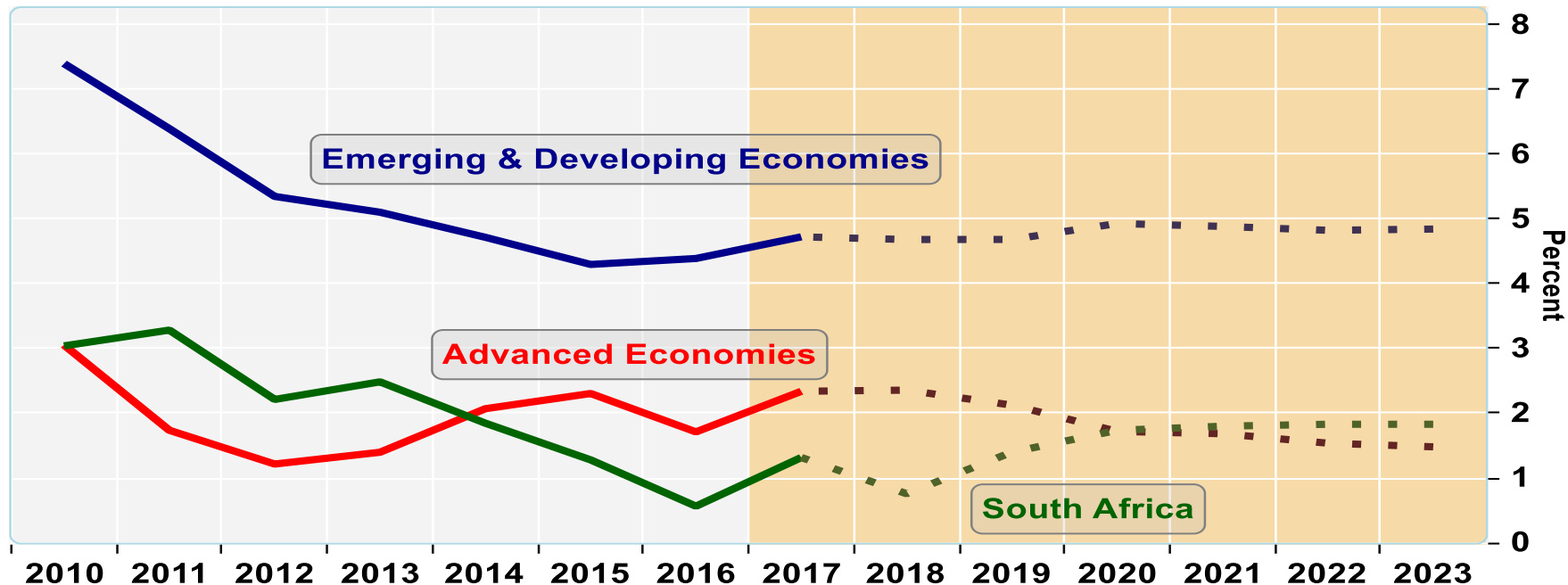
large economies % change in GDP.



Emerging Markets are still racing ahead. SA lagging.

GDP History and Forecasts.

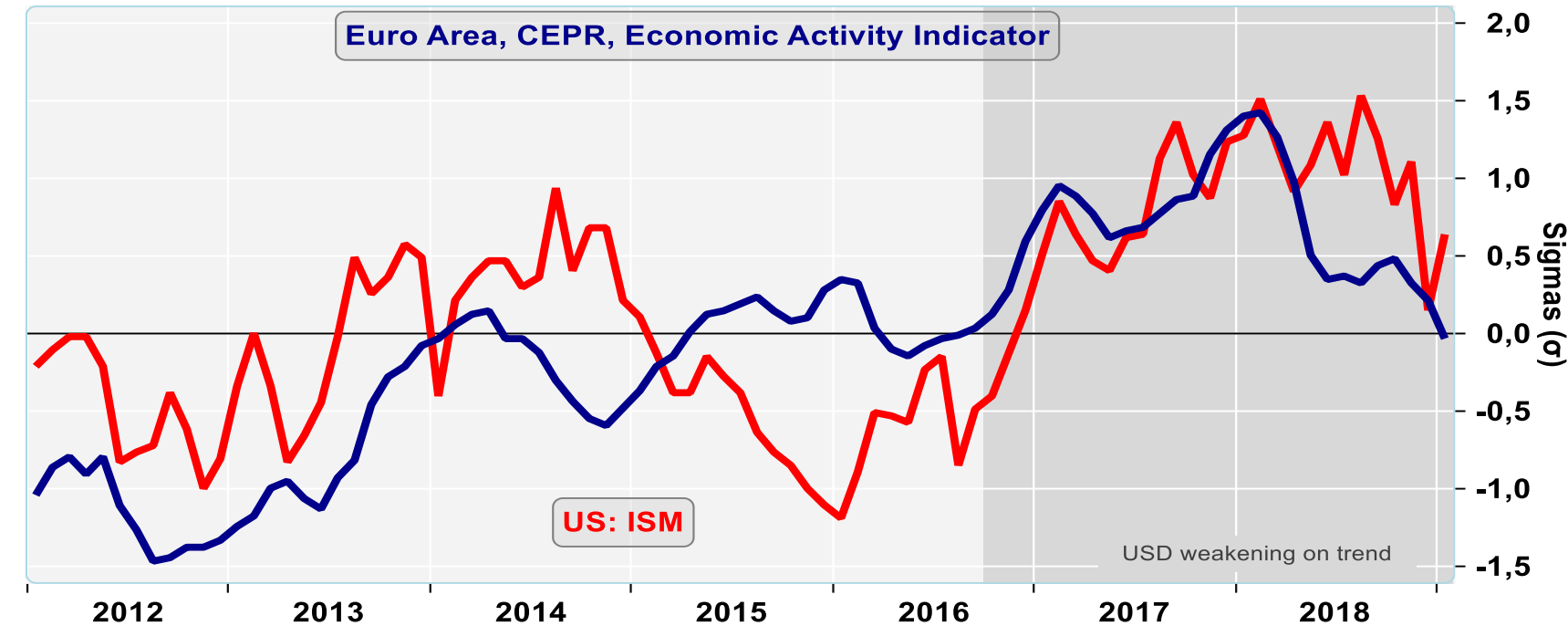
IMF World Economic Outlook.



Business surveys strongest in over a decade



Business surveys are looking strong



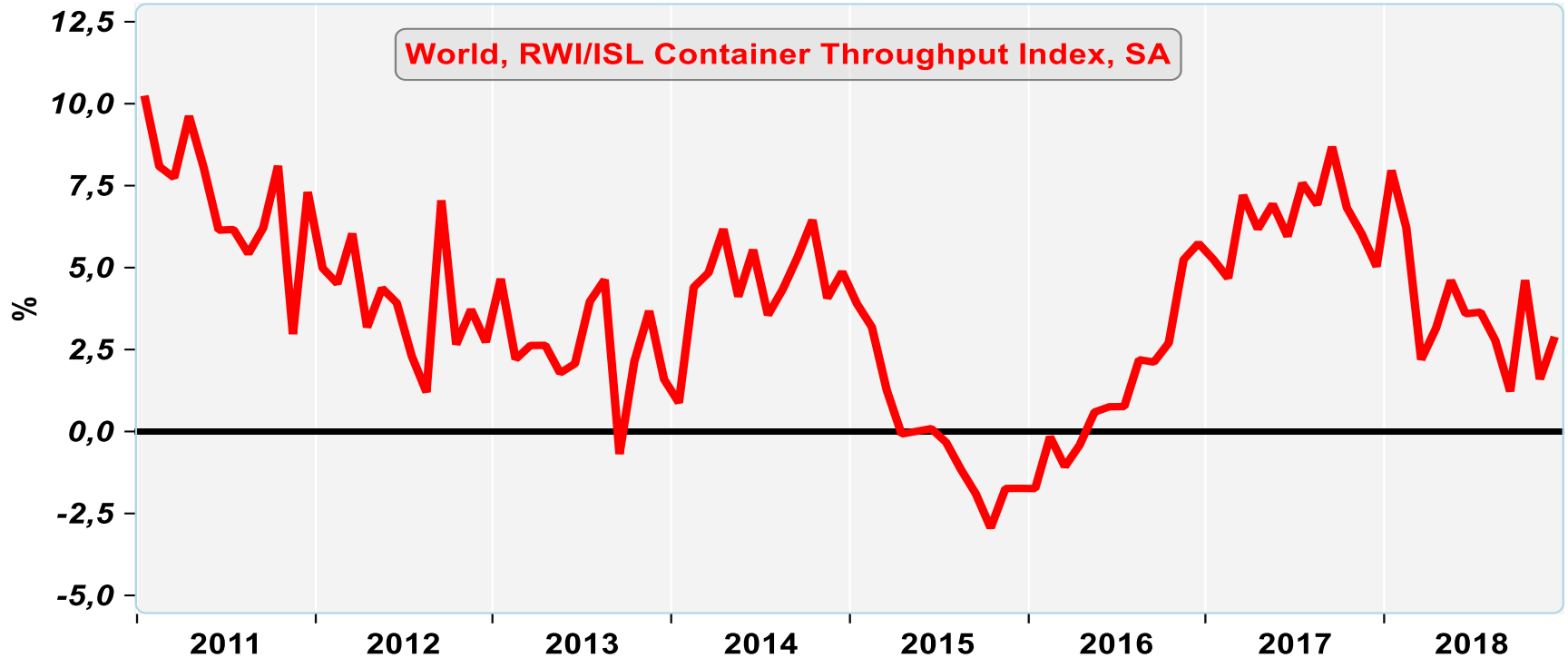
World Trade is growing but at a vastly slower rate!!

Container throughput in 85 harbours.



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World, RWI/ISL Container Throughput Index, SA





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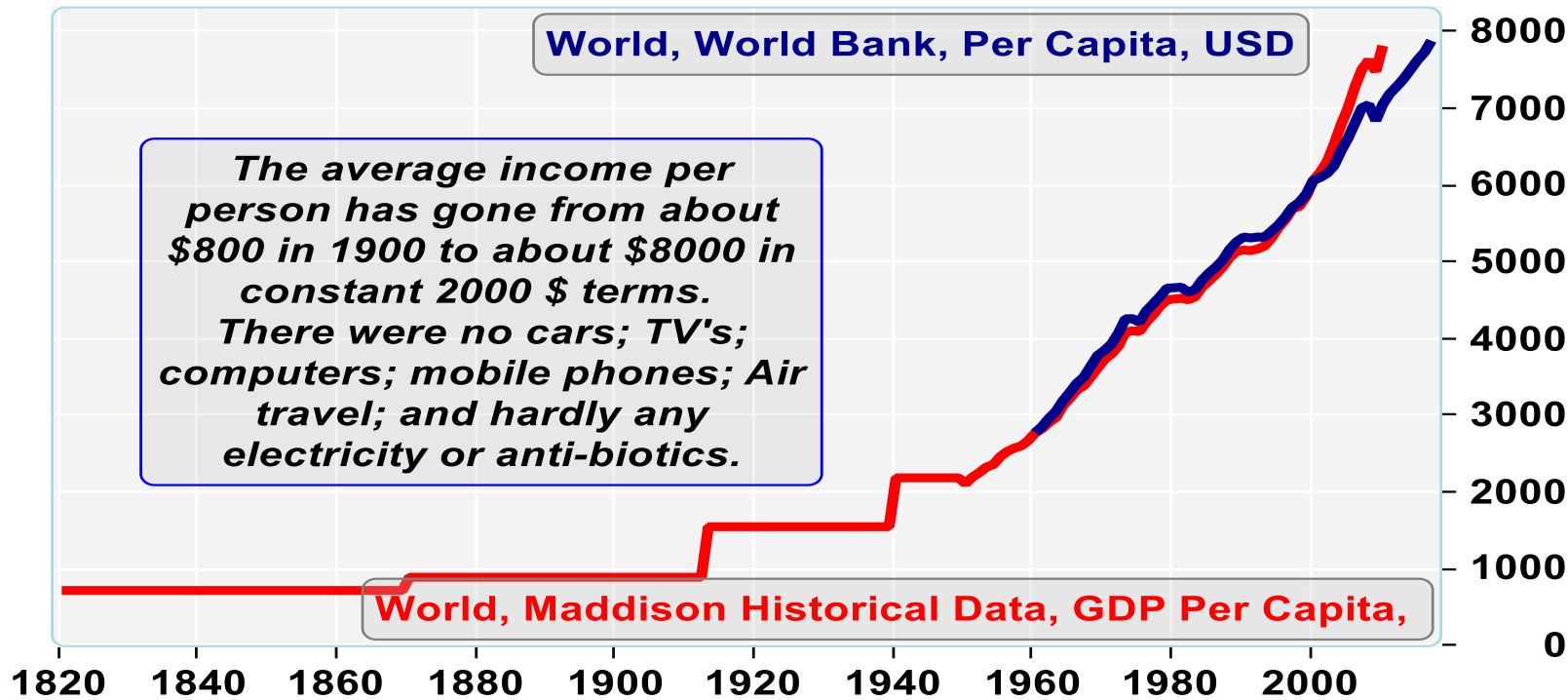
Big strokes that business must keep in mind.

Life's Mega trends that will help you make decisions.



We the people of the world gets richer

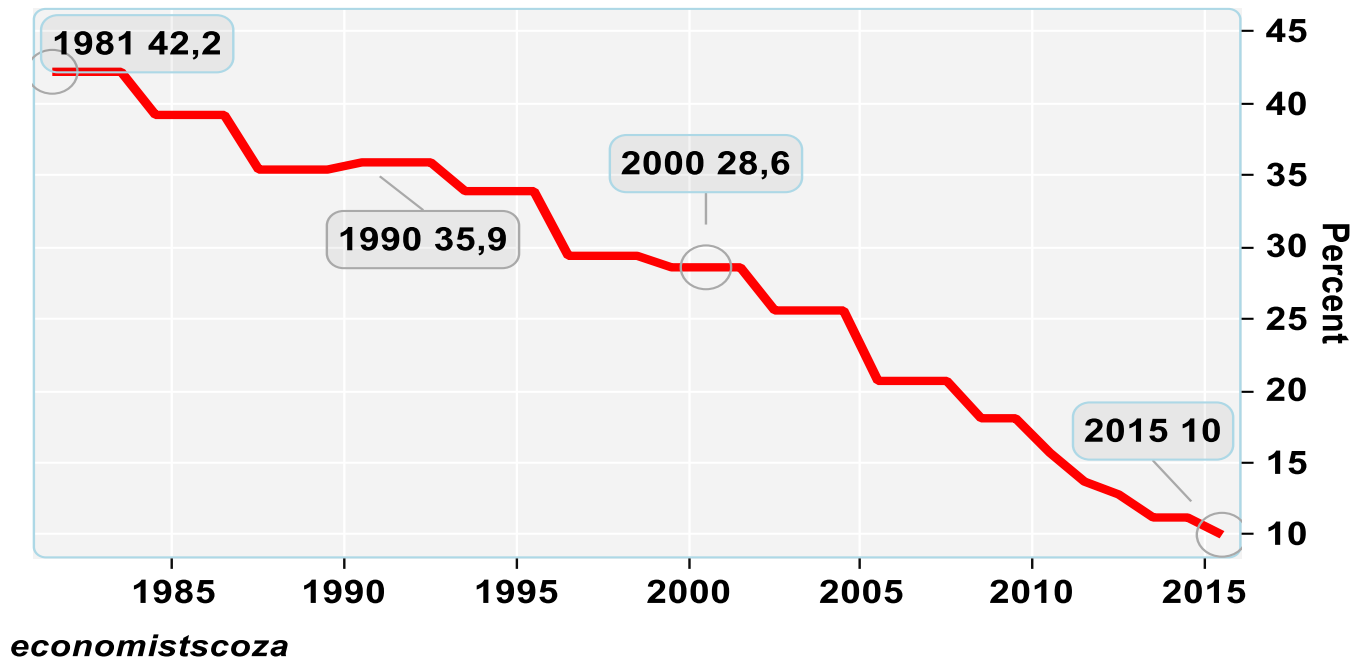
World, GDP Per Capita constant prices





There are less poor people today than ever.

World Poverty Rates, Population below \$1.25 A Day. (PPP \$) Constant Prices

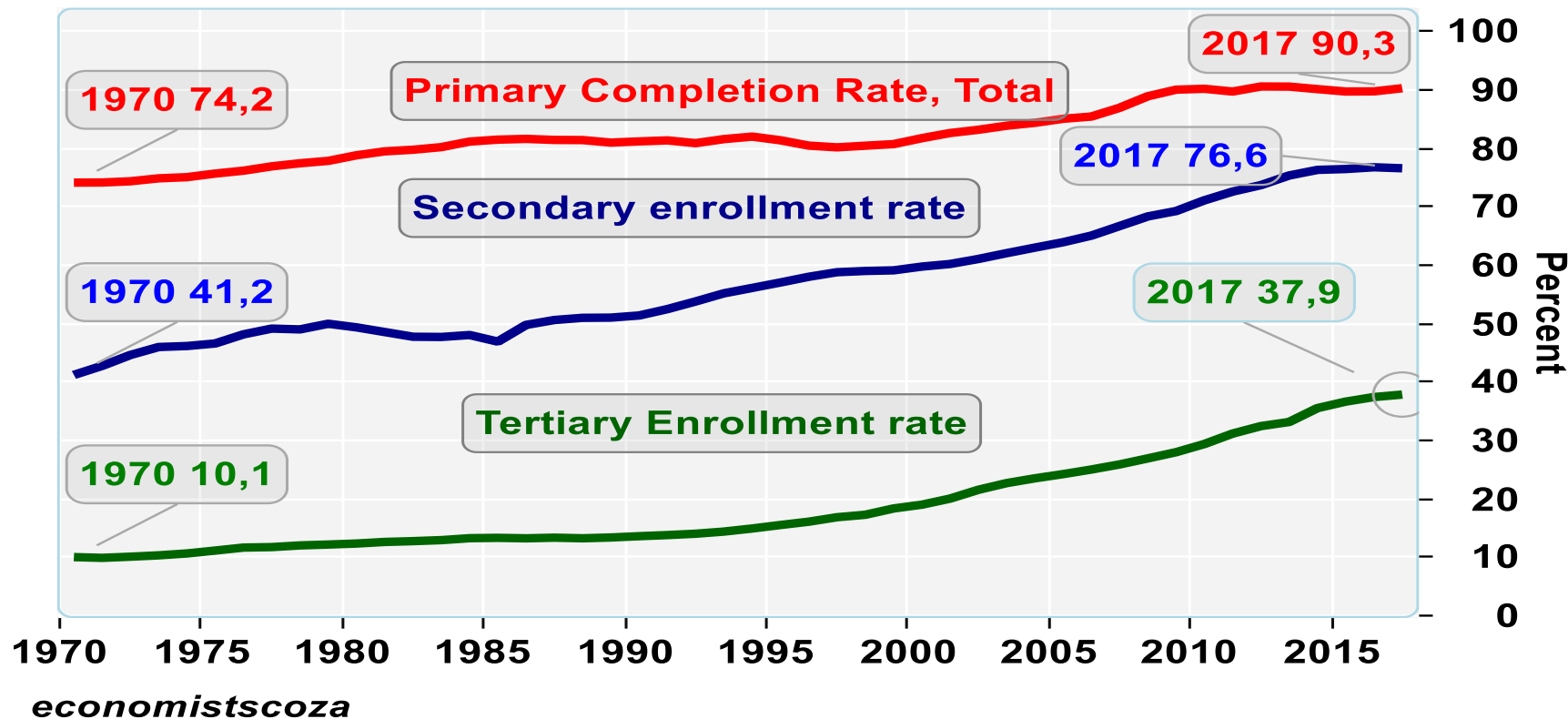


- In the next year or two there will be more rich people – i.e. over \$100 PPP\$ a day than poor!
- You never hear this good news because good news does not sell.
- SA flat lining here and we need growth to lower the poverty rate.



We world is getting more educated and skilled

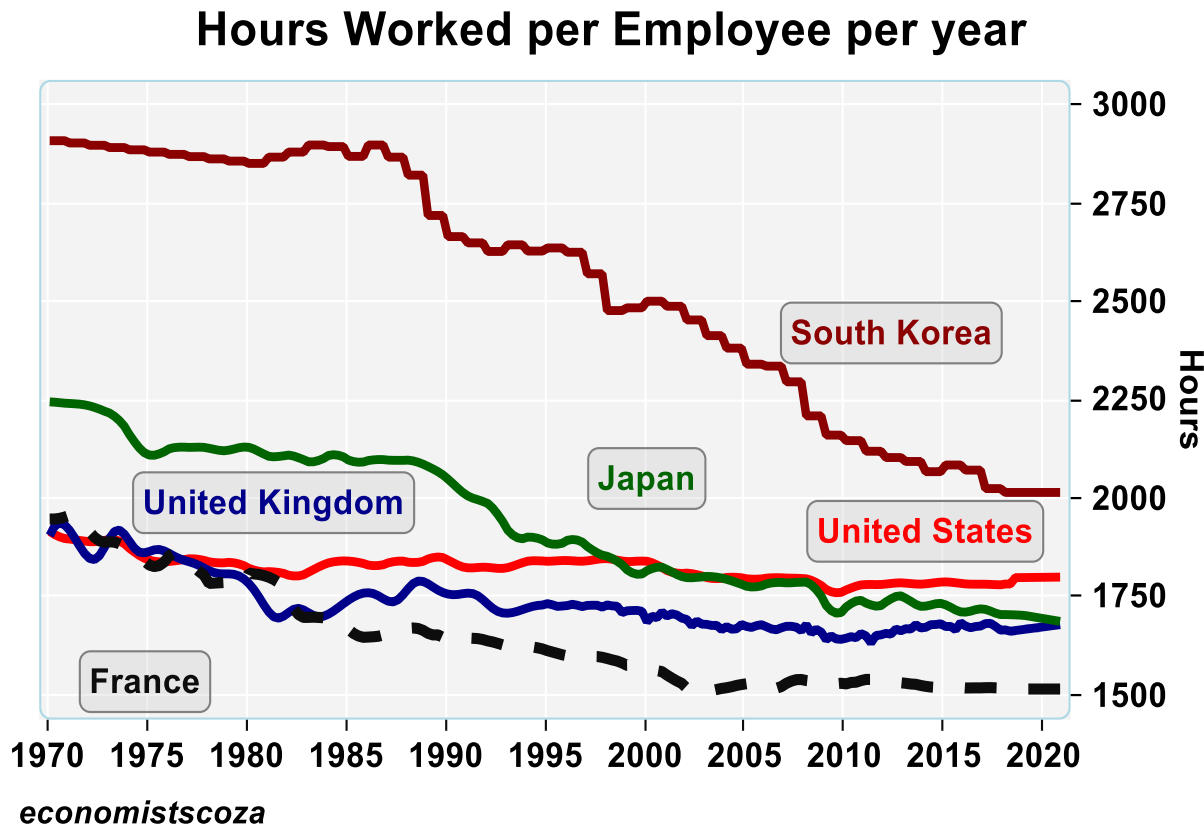
World Education





We work less hours every year.

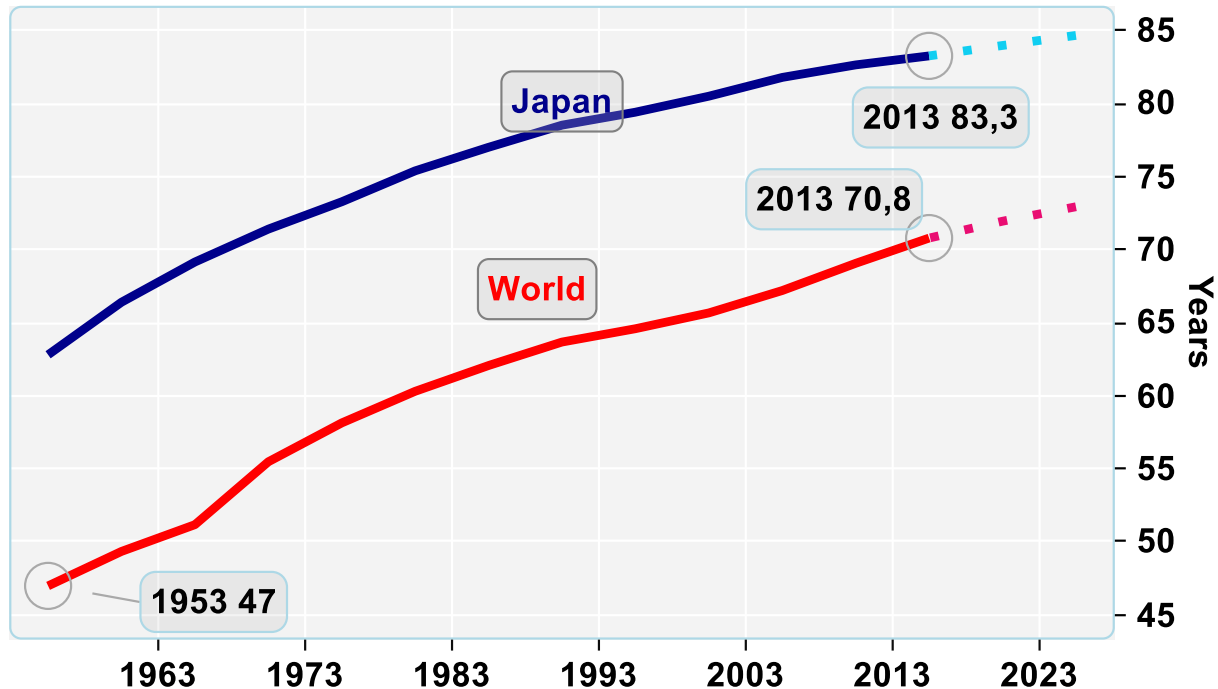
- Labour force participation rates have peaked too even while less young people are around.
- Hardly any country is still at 3000 hours per year average.
- Yet we do produce more.
- Clever production techniques but also mechanisation helped.
- Now we are on to robotics and AI when we will work even less but produce more





Today: We live 25 years longer than 1953

United Nations, Life Expectancy, Medium Fertility

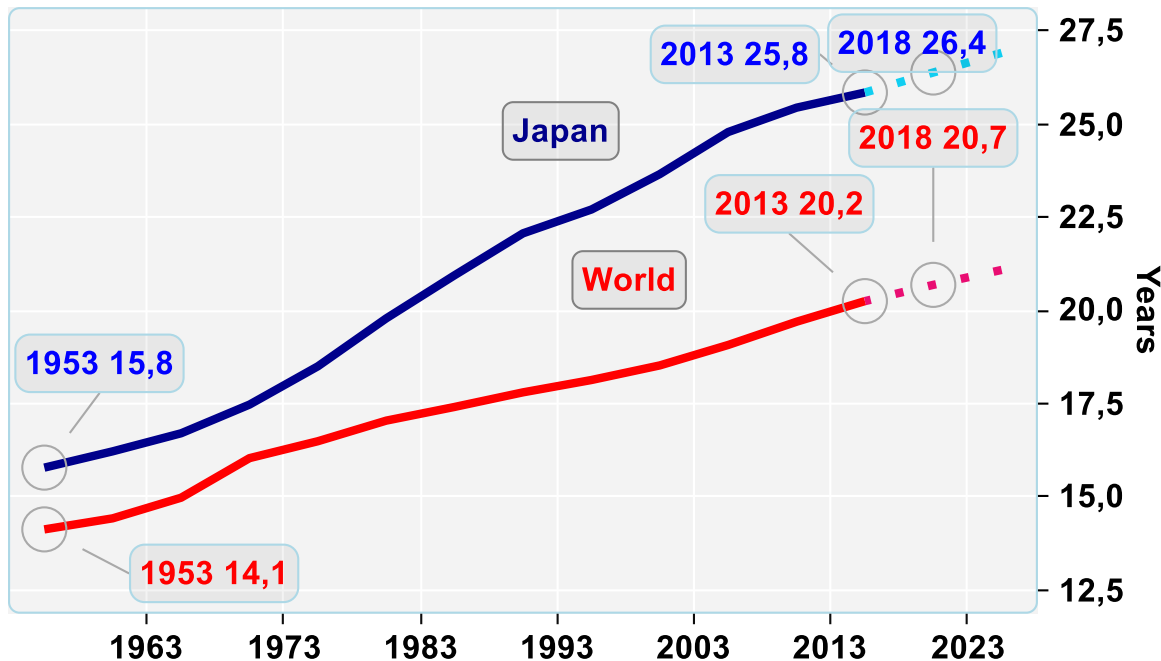


- We live longer and the more advanced nations like Japan are getting close to 90 years in the next decade or two.
- The median age is getting older too and this means the ratio of old to young is changing.
- The consumer is different.



The fastest growing part of the population is those over 60

World: Further life expectancy after age 60



The reason for this is less violence, better medicines, more doctors.

This also however means that people need to save more for retirement.

Also means that more care needs to be given to the aged as there are many more of them.

More time do things like travel, read, email phone etc.



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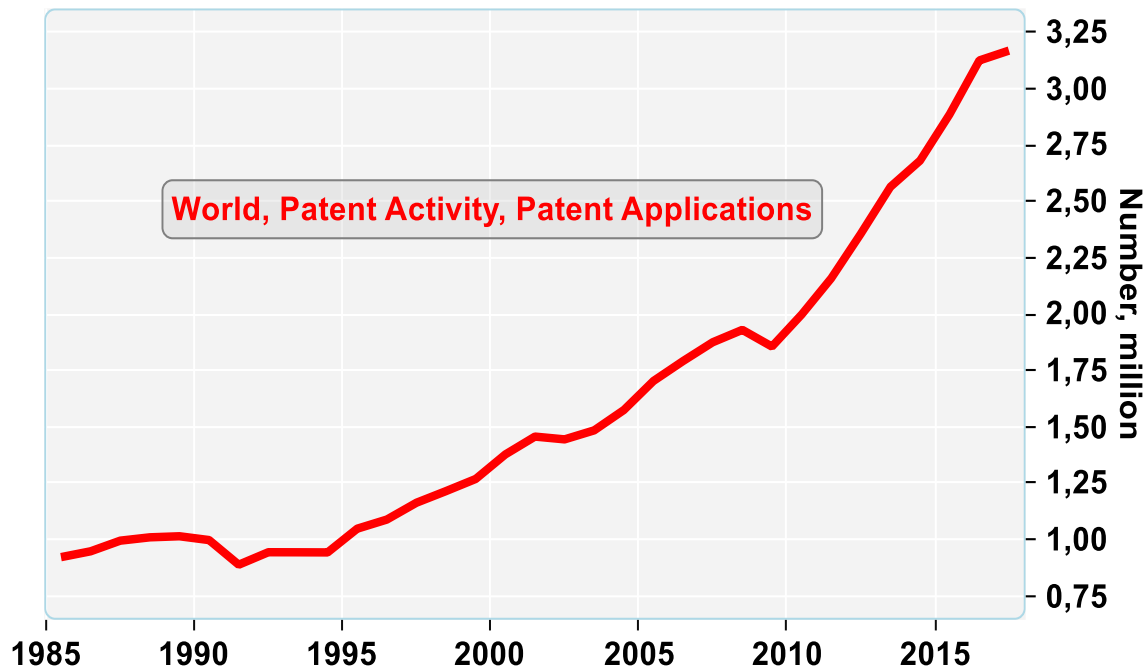
For the world but connections are similar for SA.

Automation, connection and innovation indicators.



Innovation: World Patents have increased 3 fold since 1985!

World, Patent Activity, Patent Applications



- Patents are increasingly being registered and they are growing fast as the human innovation base takes off.
- SA registers 9300 patents a year and was at 10300 in 2003. SA falling behind.
- But there is a lot of law firms registering international property rights here so we do get to use them

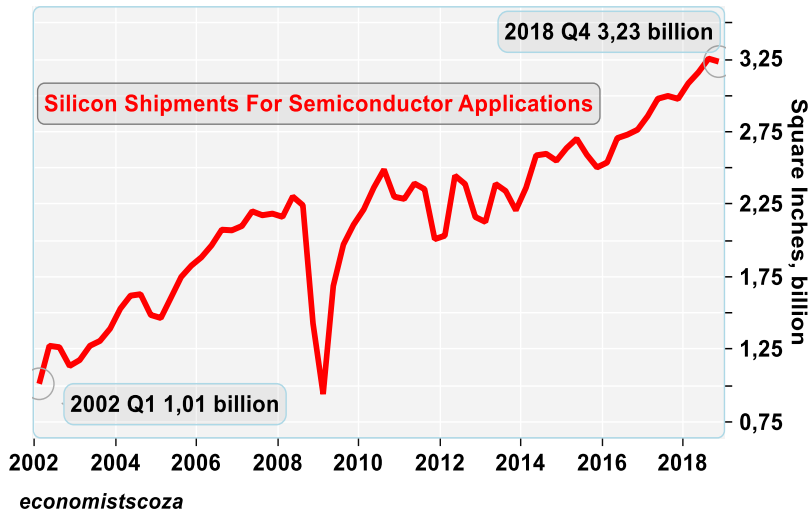
More brains for connections and machines

Three fold increase in volume

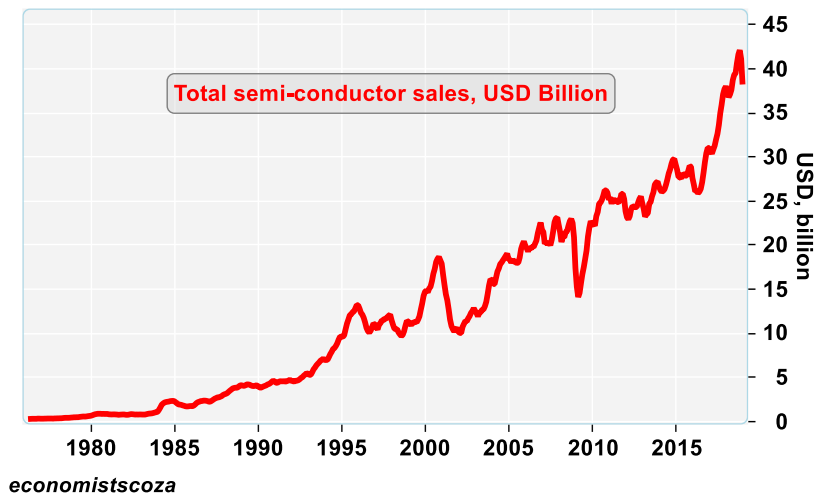
1000s of times in power

40 times increase in sales in 40 years

World, Silicon Shipments The hardware is growing.

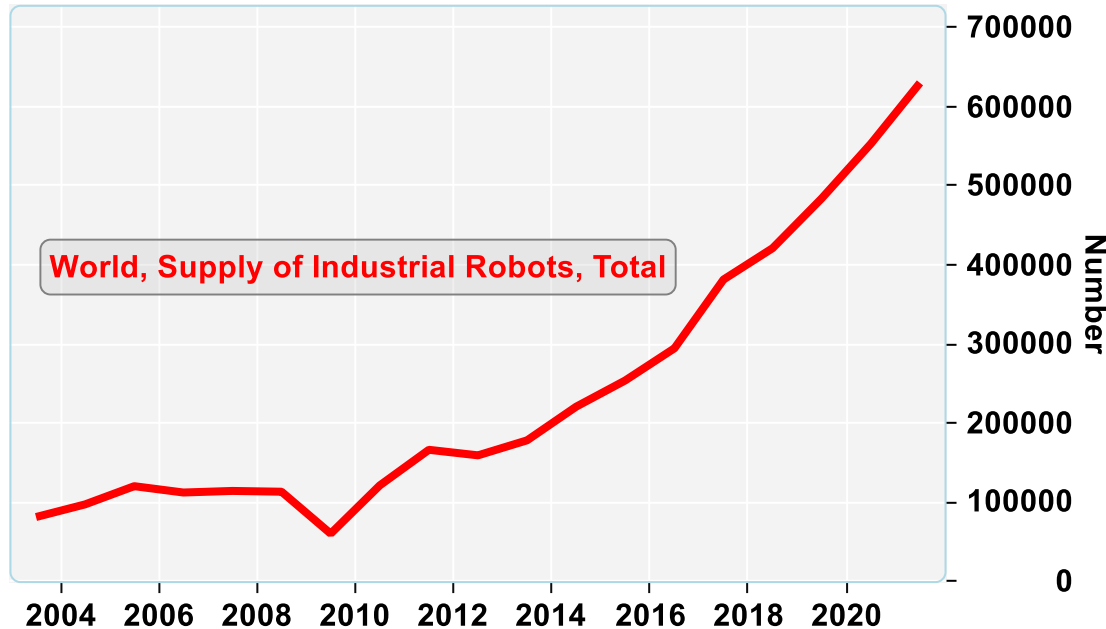


World Semiconductor sales



Industrial Robots delivered

World, Supply of Industrial Robots, Total



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- In Japan, there are **1,240 industrial robots** installed per **10,000** automotive employees.
- By 2018 there were 2,1 million industrial robots installed around the world.
- They are mainly in automotive; computer and mobile manufacturing.

- **Applications for industrial robots** include welding, painting, assembly, pick and place for printed circuit boards, packaging and labelling, palletizing, product inspection, and testing; all accomplished with high endurance, speed, and precision.
- In South Africa they are mainly found in the automotive and packaging industries. SA has less than 10 000 probably closer to half that number
- To get further investment here SA would need a stable power supply as well as more certainty and skilled staff.
- But Automation is coming to mining and even Farming.

Robotic weed remover.



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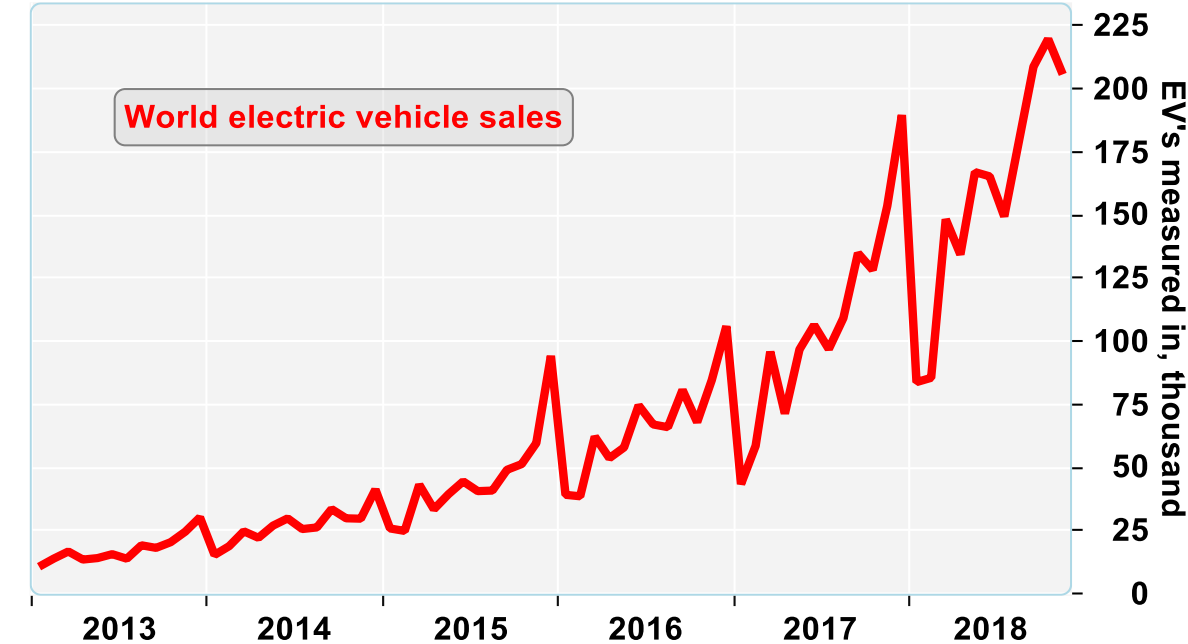
- Makes weeding easy and one gets planters, strawberry and grape Picking robots that work on their own.
- In SA farmers get weather map and they get soil moist measurements on nearly even single square meter.

Electric vehicles registered every month in the world



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World Electric Vehicle Registrations monthly total



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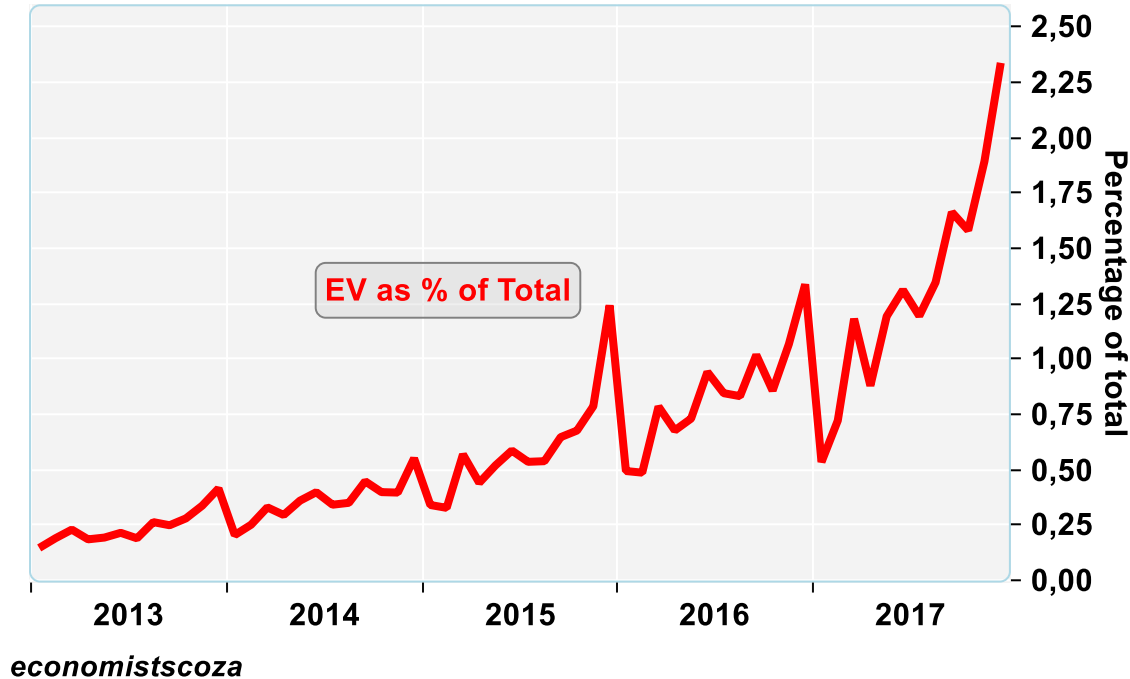
- November 2018 saw 205 000 EV registered around the world.
- That was nine time the amount of January 2013 which indicates that the growth is very strong and EV are at a very early stage still.
- We will see EV numbers at around a million a month in four years time.

EV are however still less than 2,5% of total vehicle registrations.



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Electric vehicles as % of total vehicles manufactured

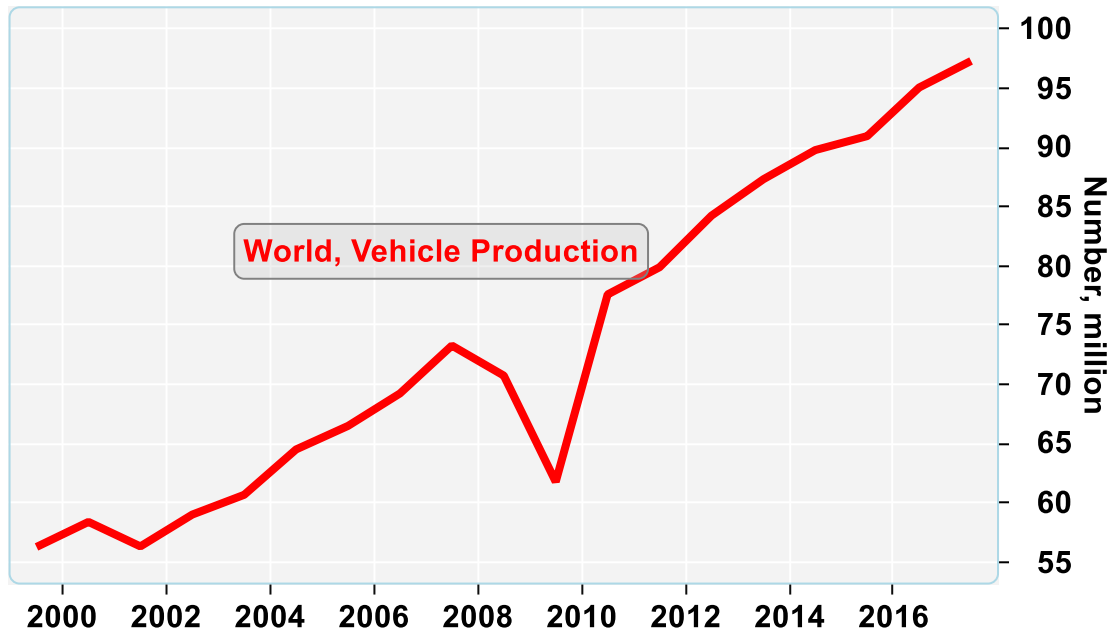


- With year end shares of EV always higher it is likely that for EV to get to say 10% average of a whole years sales may take another five years.
- We may also see less subsidies as power grids will become very strained as EV charging will fast become a new big category of demand.



Total Vehicle production has nearly doubled in 17 years.

World, Vehicle Production



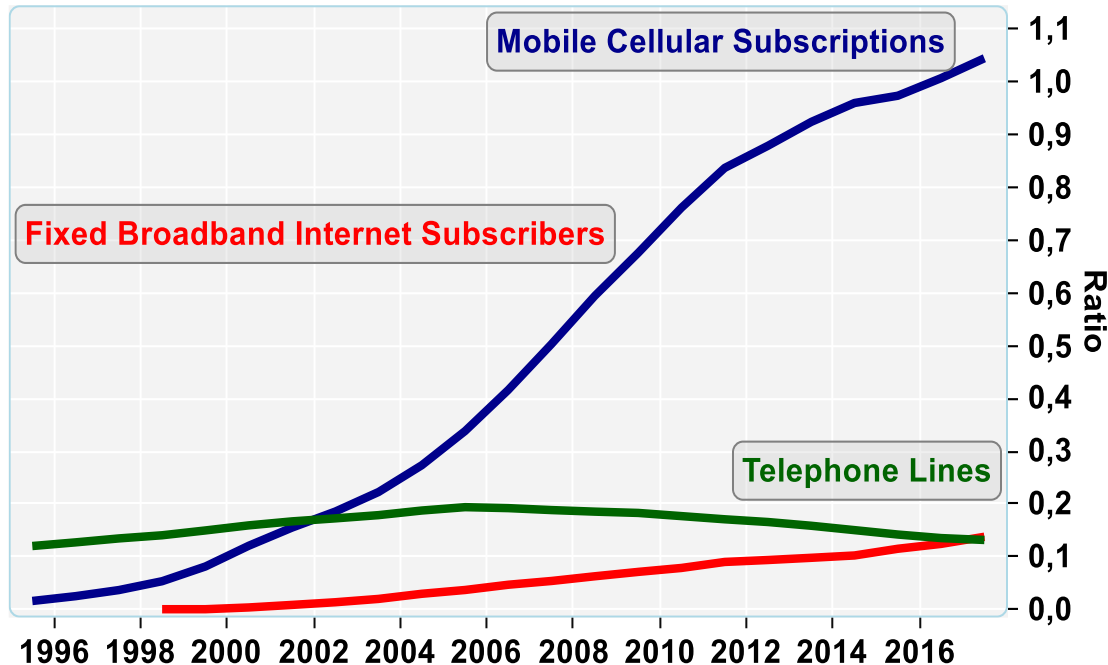
- There were 97 million vehicles produced in 2017.
- Very important to note that SA share has remained about 0,5% of the total.
- SA needs to find a niche rather than chase volumes and that maybe Vans (Bakkies) and minibus taxis which is what our neighbourhood needs.

- It can already be done but.....
 - People are scared. In fact commercial planes can take off, fly and land themselves for decades but we still have pilots.
 - Often in bad weather it can be safer for the computer on a modern aircraft to land the plane.
- Self-driving cars have had setbacks but it is in the fears of humans rather than the technology.
 - I would expect Uber to be around for sometime although with much help from technology from maps to weather to best estimates for where a customer may be.



World Connections: Here SA competes.

World Communication: How many per person?



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- By 2017 there were more mobile phones than people but SA was ahead and reached that level just after 2011.
- Old landlines are declining and have been taken over by fixed broadband. In SA we are slightly behind although 33% of adult population has internet either at work or at home or both.

South African connectivity is good if not great.

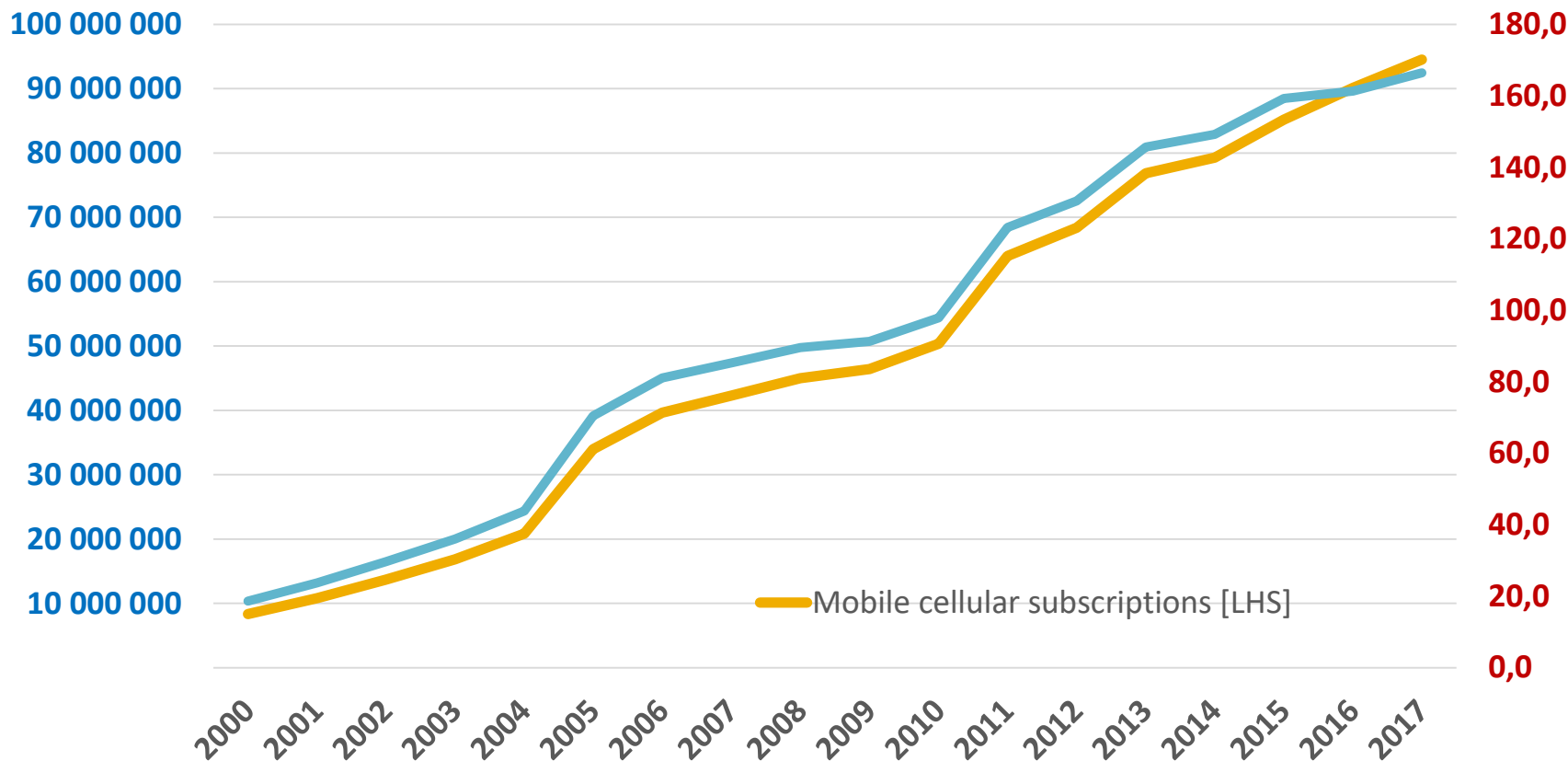


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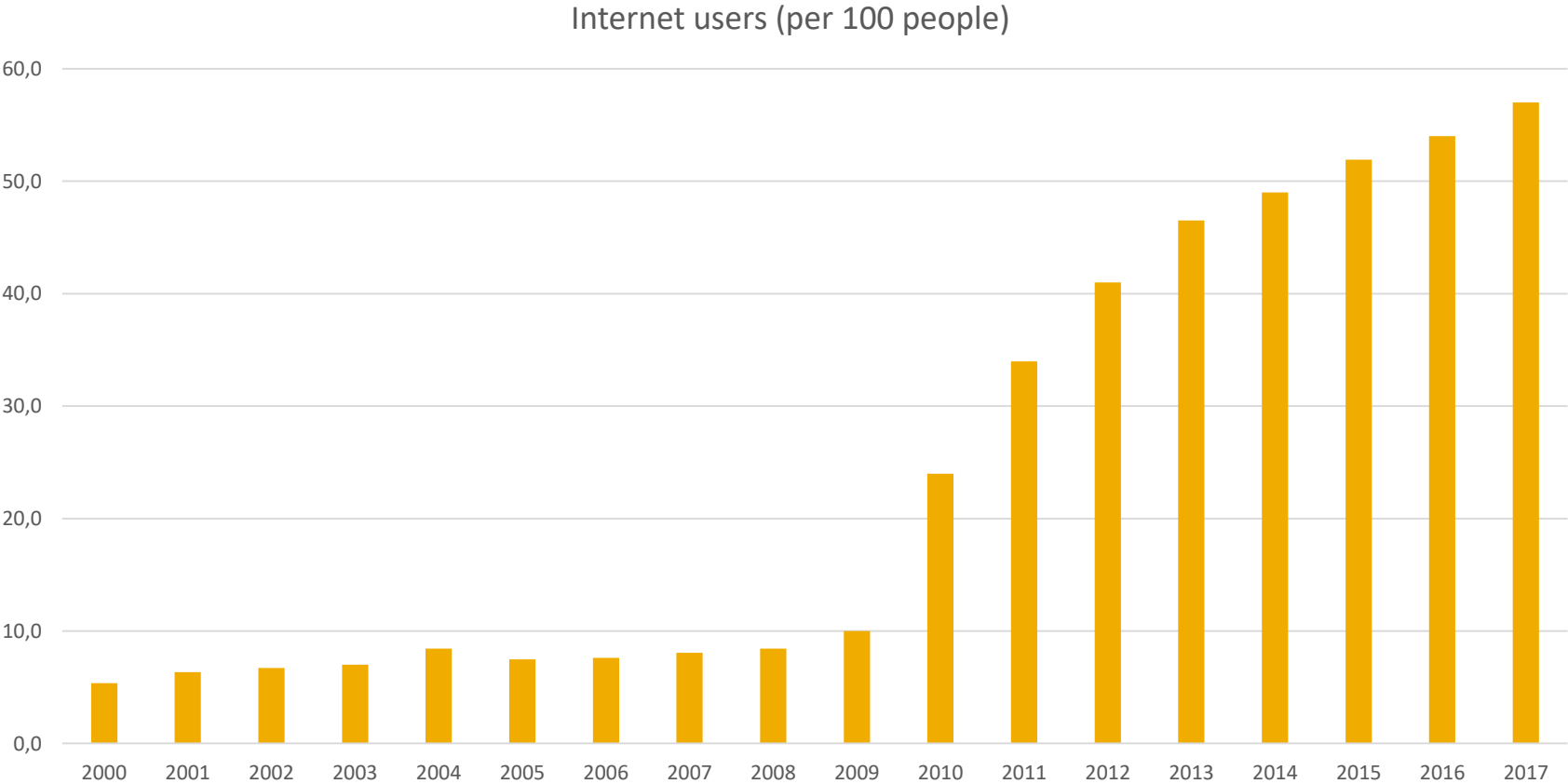
- South African are good adaptors of technology but hardly innovators.
- Indications are that about half of SA population accesses the internet via smart phones but only a third via fixed or dedicated internet network devices – (either home or work). (2017)
 - Growth of smart phones very quick and SA imports about 26 million mobile phones a year for 57,6 million people
- But South Africans do read the news and social media from phones.
 - Similar pattern developing in Africa but a year or three behind SA.



SA mobile subscribers and subscribers per 100 people



SA Internet users per 100 people





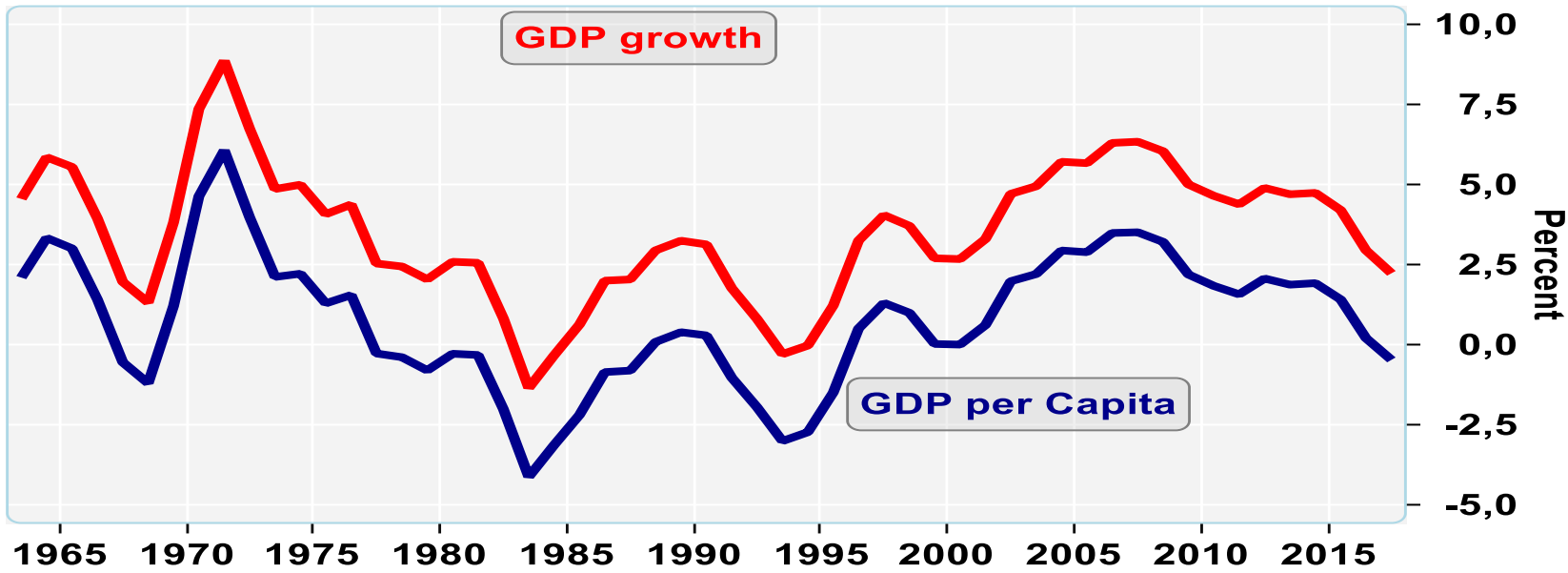
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We may not compete at the highest levels in great numbers but we are quick learners and adapters.

The World of skills in Africa and SA.

Much of the African growth story was tied to the commodity cycle.

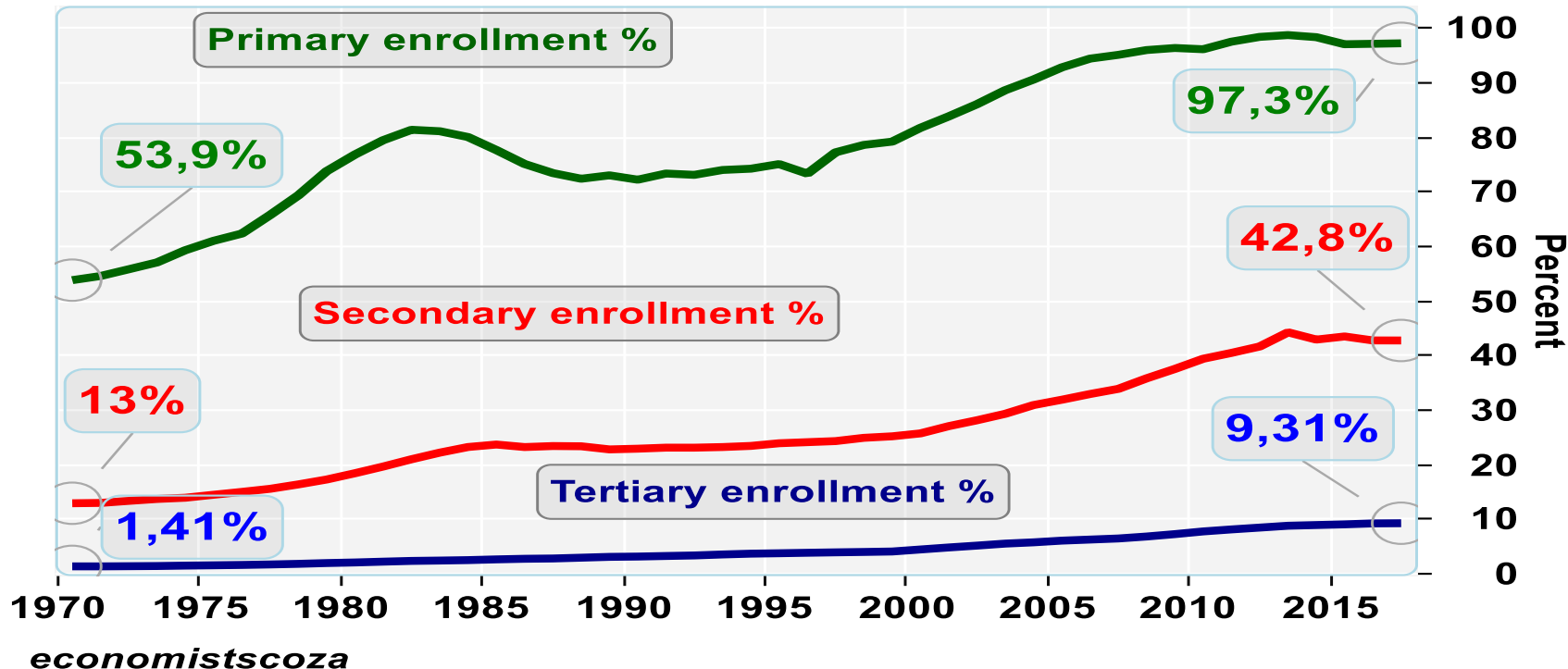
World Bank, Sub-Saharan Africa, GDP growth and GDP per Capita - 3 year moving averages





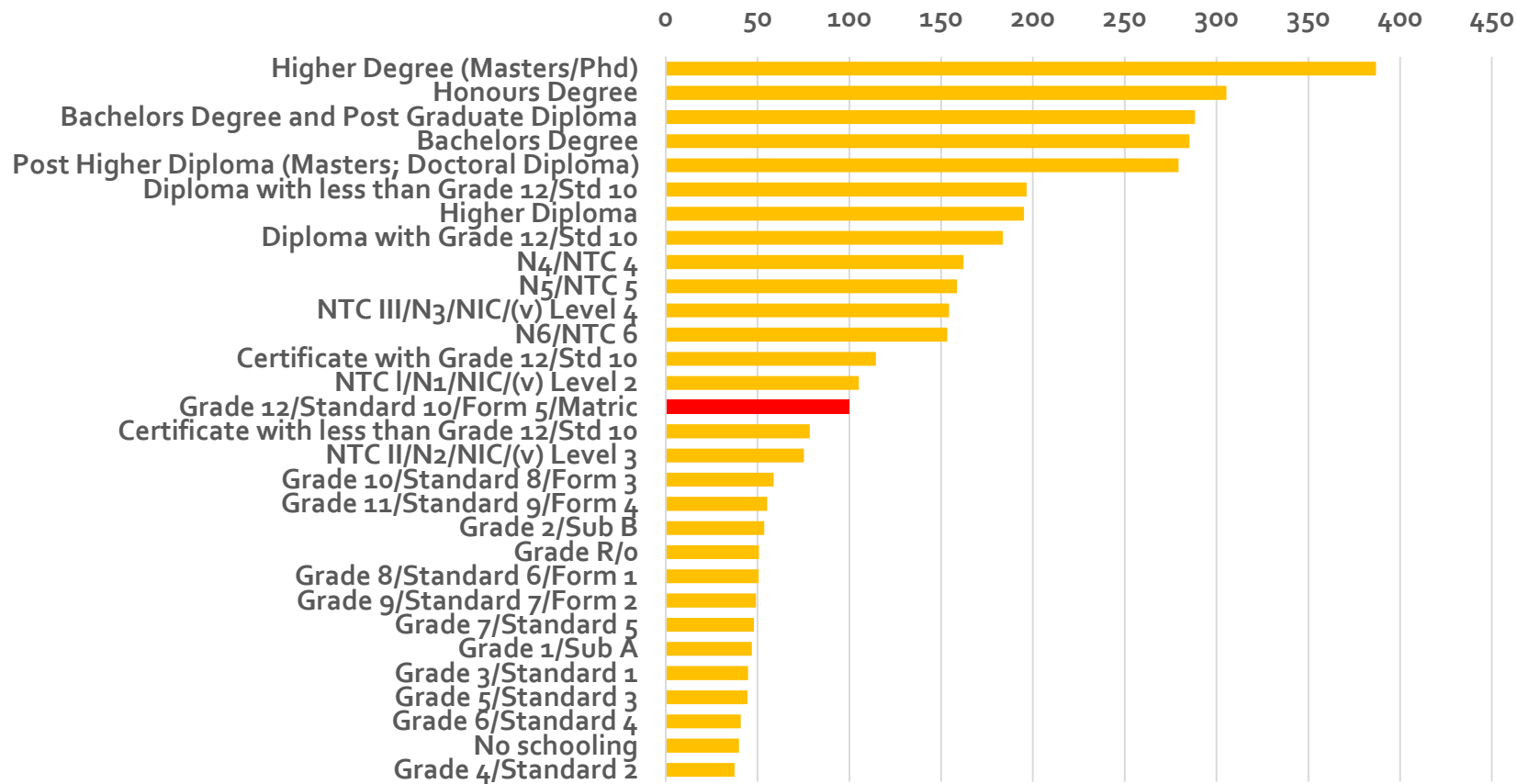
Vast improvement in the African Skills base.

Sub-Saharan Africa: Participation in Education.



Education and earnings in SA 2015

Matric = 100

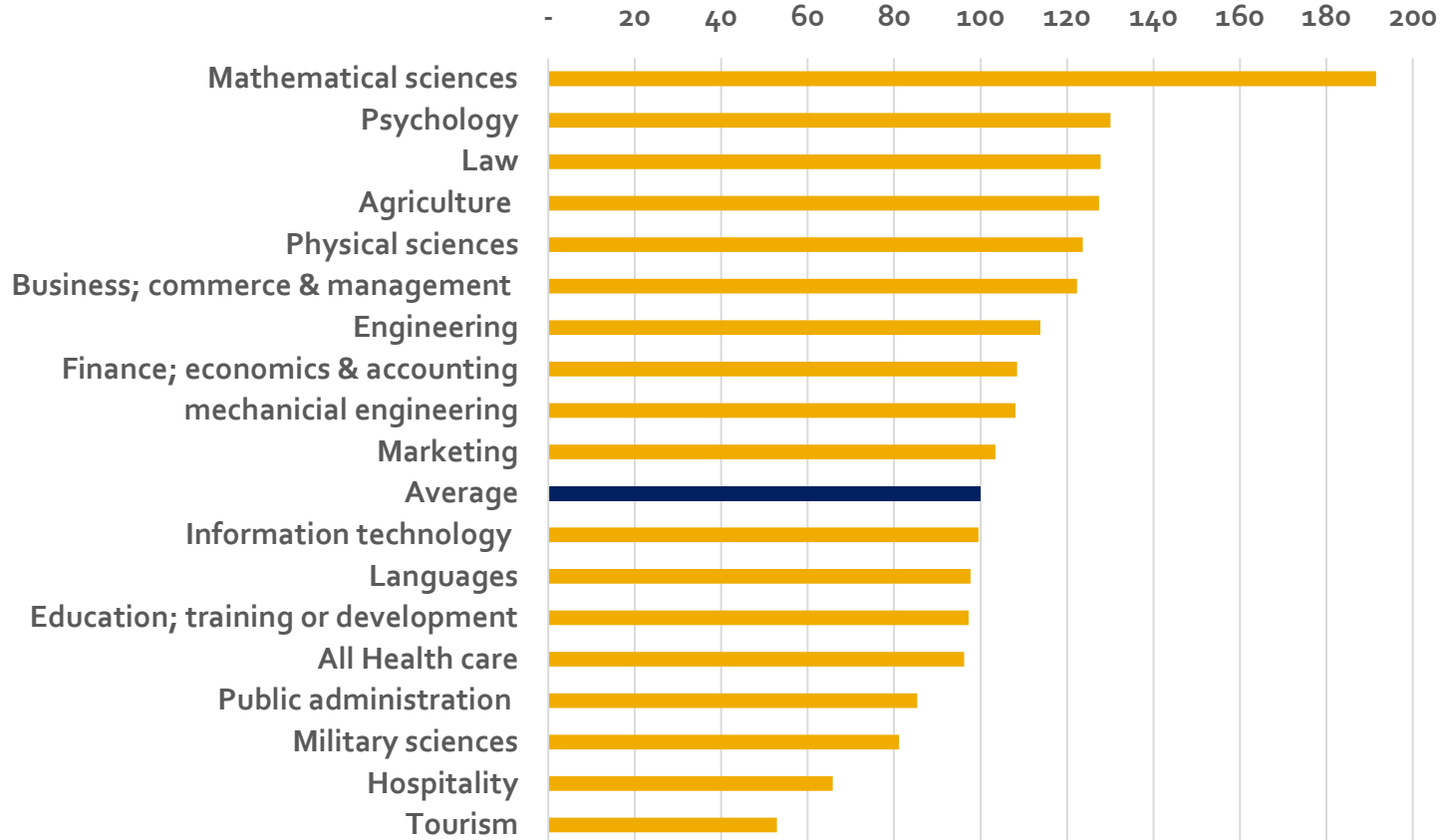


SA: Field of post school study and relative earnings – 2015.

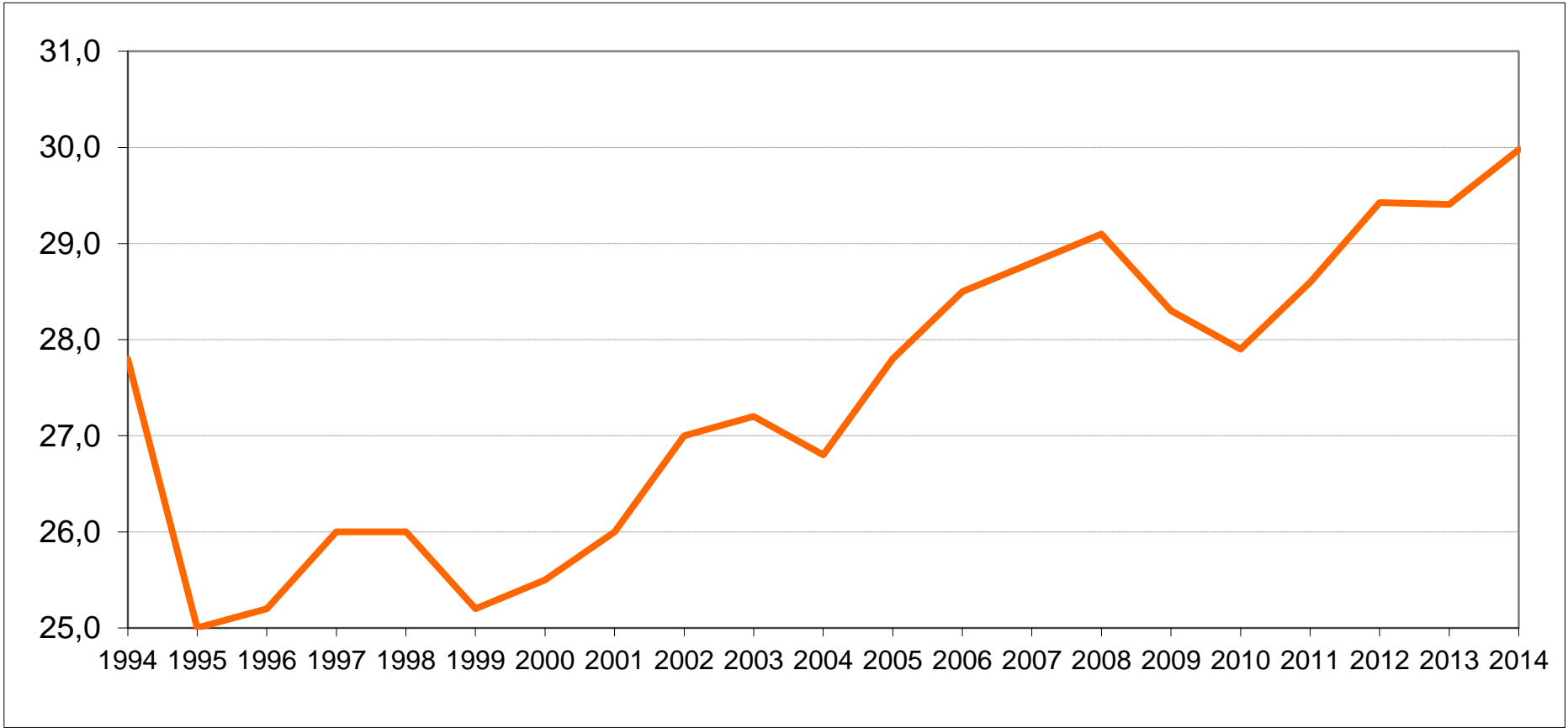
Average = 100 in 2015.



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Graduating % of Science Engineering and Technology Students



The Future in some important respects looks bright



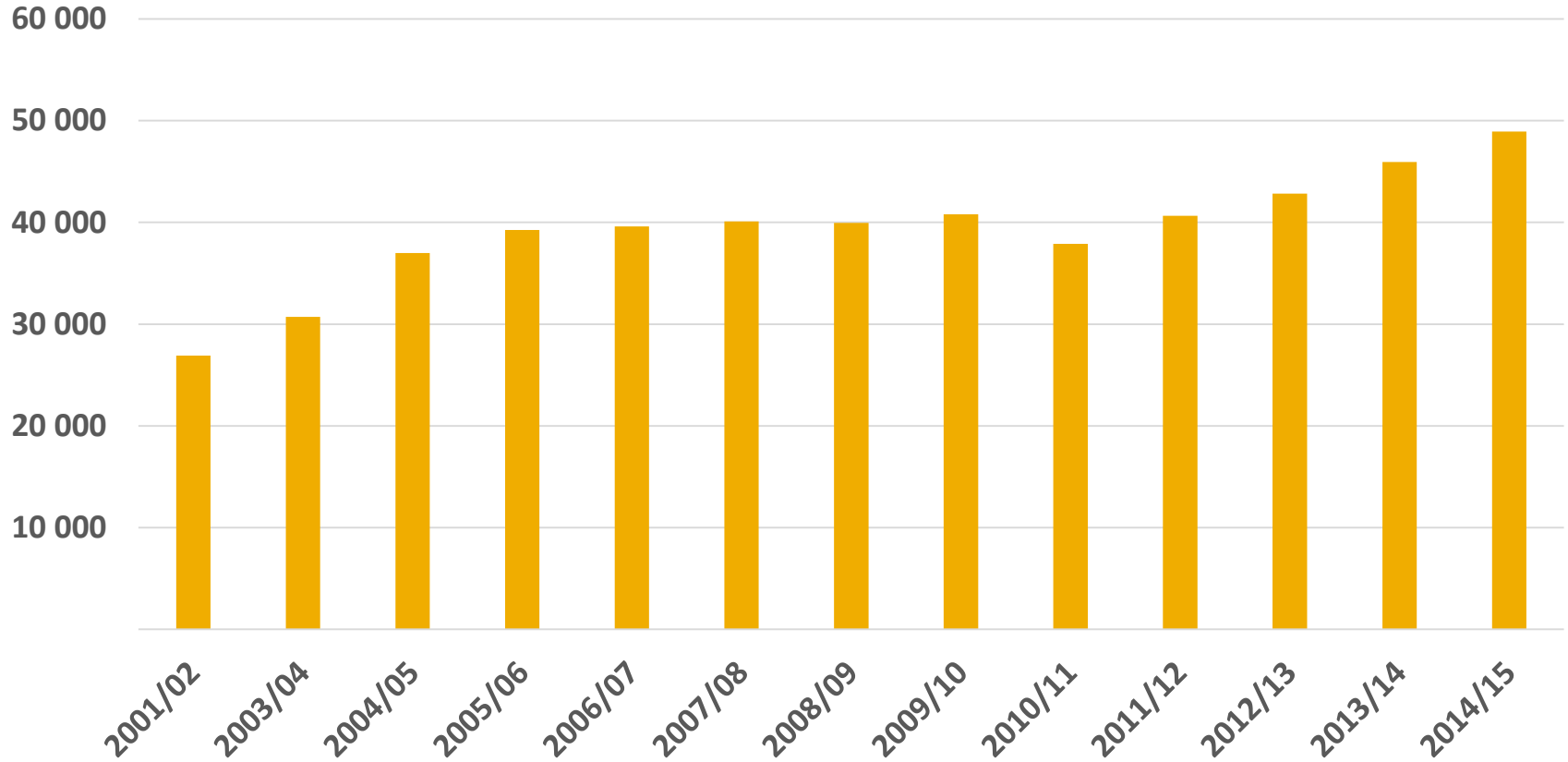
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- The number of SET graduates has increased from 20 598 in 1994 to 55 574 in 2014.
 - The quality indicators were similar for 1994, 2008 and slightly lower in 2014.
 - There are more graduates therefore more choices for employers.
- Total graduate were 74 137 on 1994 and 185 375 in 2014. It seems that numbers will be higher in future although some quality concerns have crept in recently with institutions indicating they have to pass a certain percentage.
 - Good news overall however but a little more caution is needed when hiring

SA: Number of R&D researchers in Industry, government and Universities. Source: SA presidency



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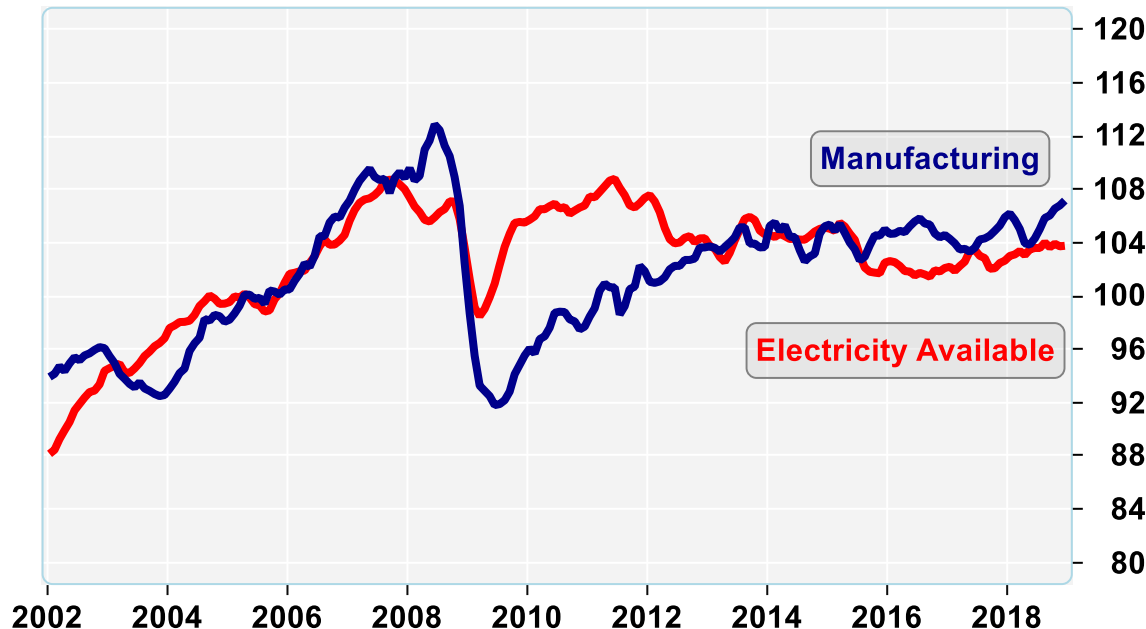


The massive elephant in the Room: Eskom



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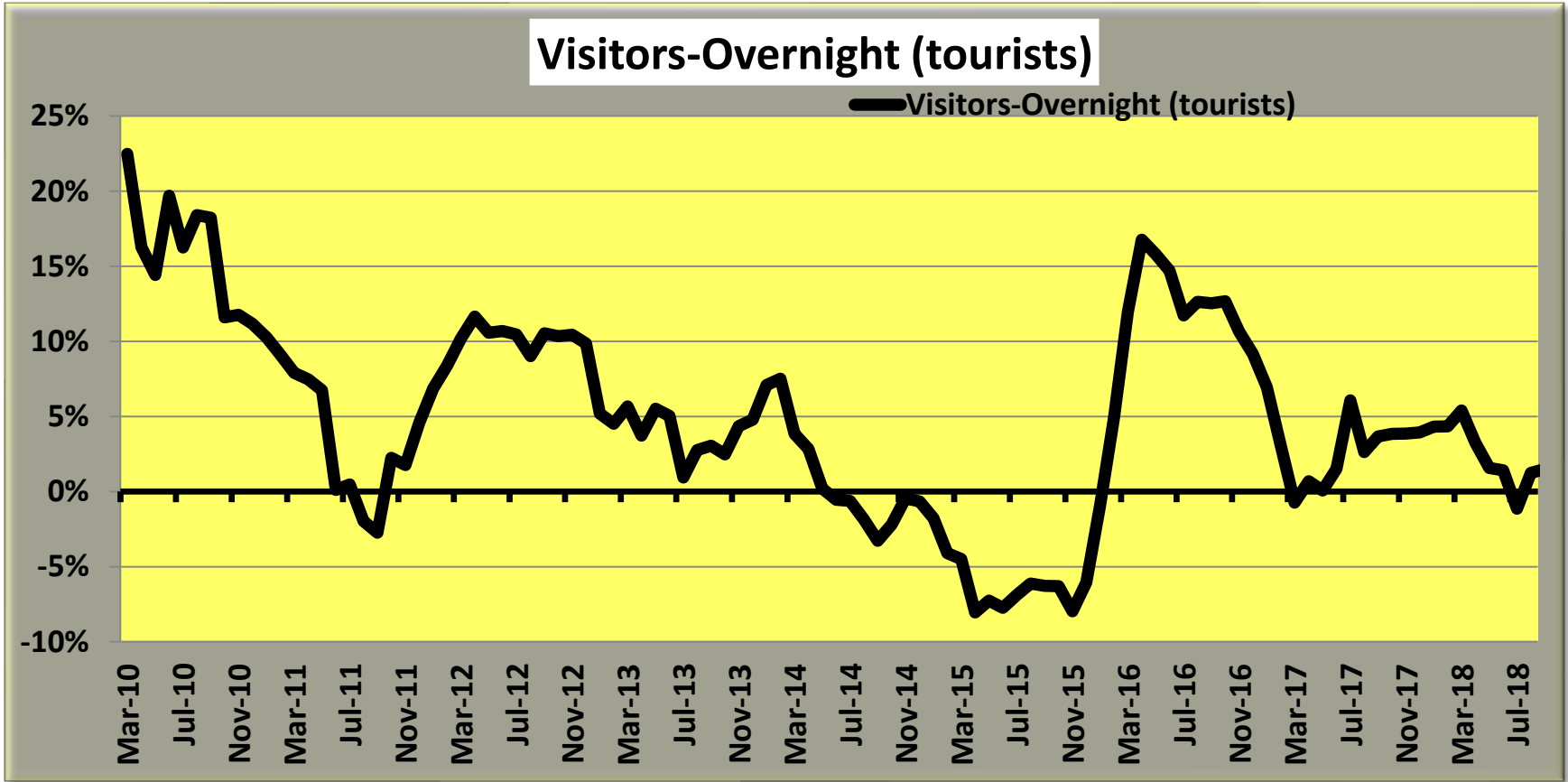
Electricity and the effect on manufacturing



It will take about 18 months to 30 months to sort our power crisis and that will hamper SA automation for some time to come.

It will not hurt mobile and internet providers as much and that is perhaps where our future will lie for now. Minimal impact on tourism or say agriculture.

Is Tourism SA best industry –even with load shedding.



Remember Automation is more than a machine. It is a system



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- For example In tourism more and safer aircraft are import.
 - Yes A380 will stop production but the biggest two engine aircraft will shortly carry 400 passengers – more than a Jumbo.
 - More fuel efficient and quitter with less pollution is also an innovation.
- Uber, AirBnb and similar services are important factors today.
- The connections that grow are important.
- The Visa system need fixing and “automation.”
- The safari app in the Kruger is a good way of connections working to see animals for example.

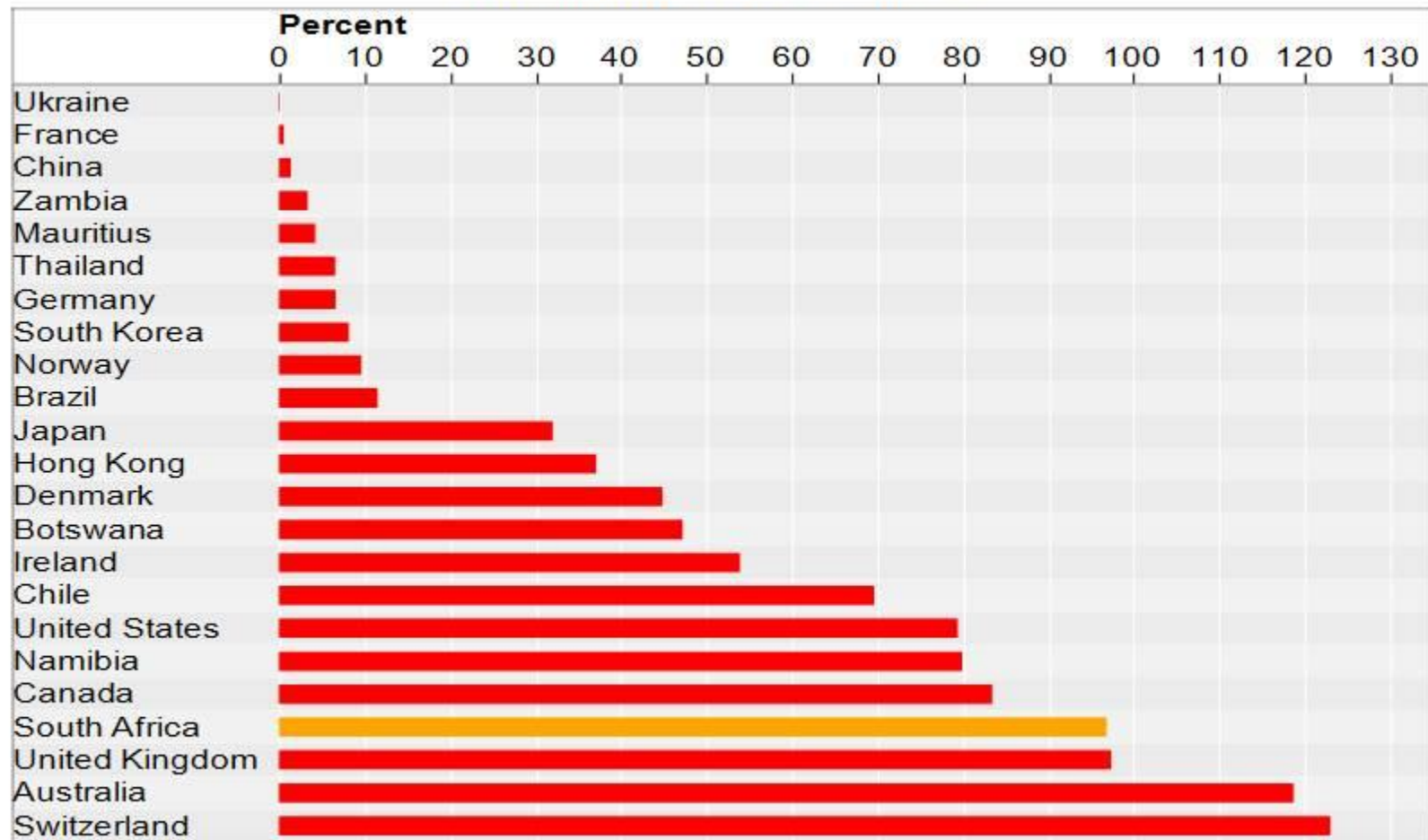


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SA Assets are good and that will help SA in the retirement age.

Just a thought on longer lives and SA.

Pensionfund assets as % of GDP

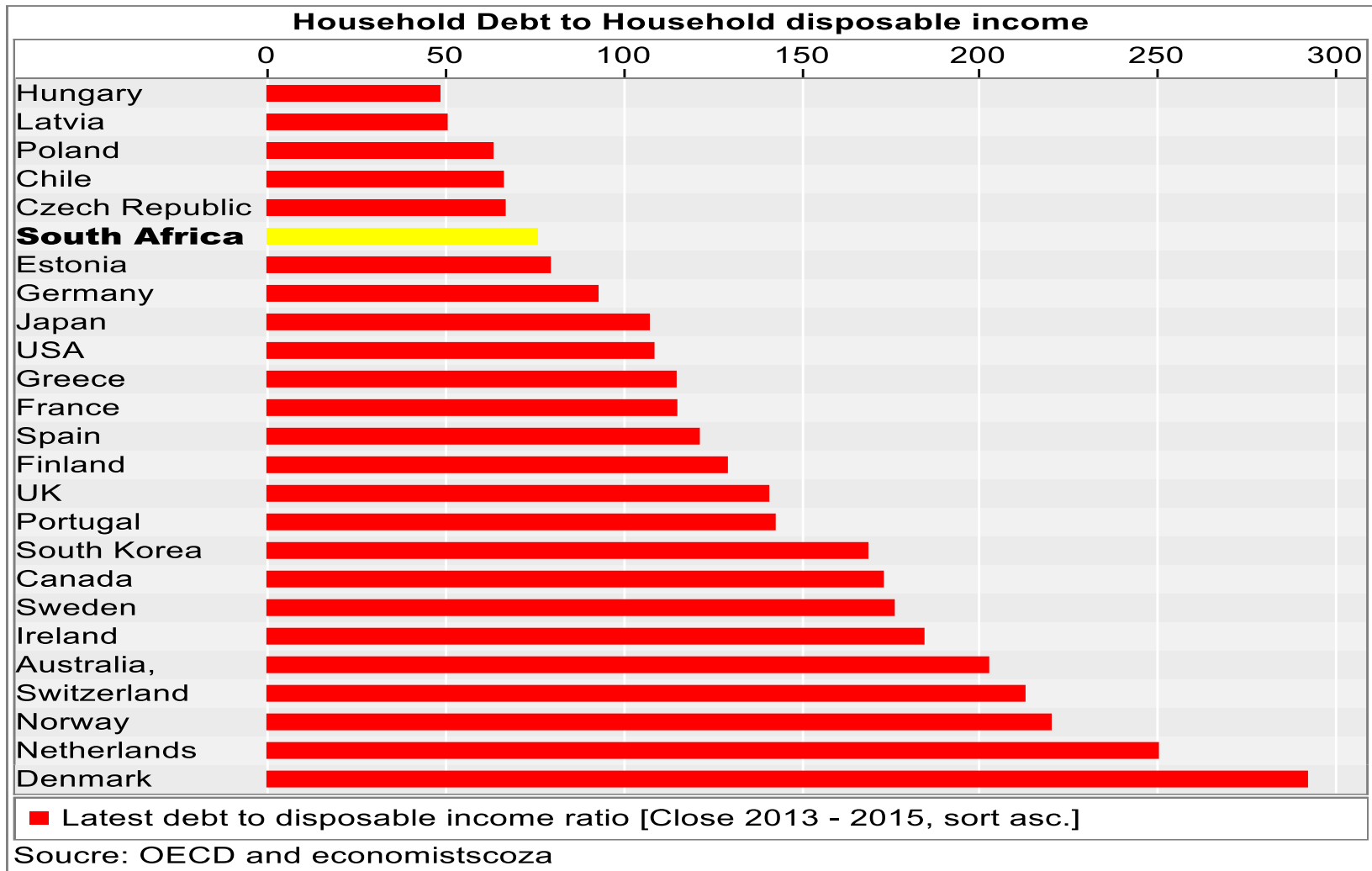


OECD and Economistscoza

Just adding thoughts on this sector.



- The Pension Fund wealth belongs to about 12 million people.
- Most of the pension wealth belongs to people who are not white – about two thirds in 2016.
- This industry funds innovation more often than banks so the venture capitalists can get funding.
- The managers are generally very knowledgeable and rely on information a lot.
- They are world class.





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Quick normal forecasts in the short term.

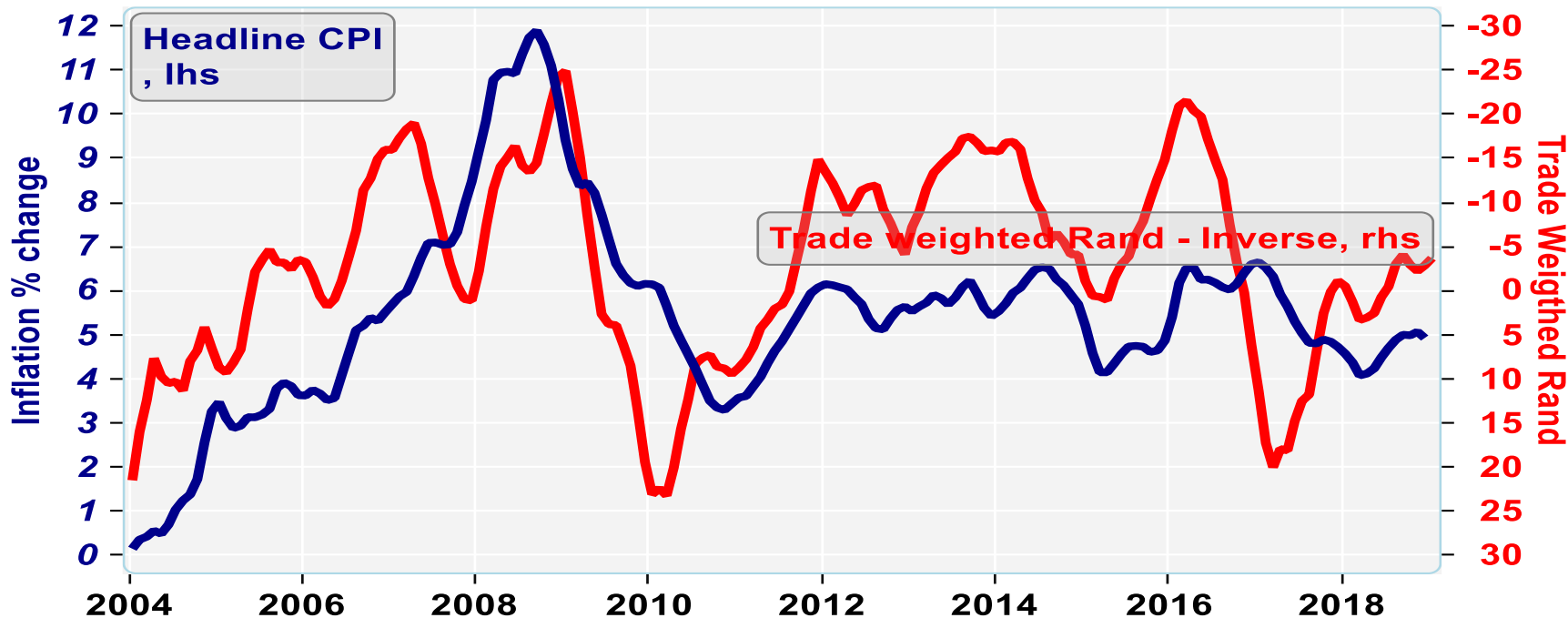
Rand influences inflation.

Many importers price R/\$ at R15 anyway



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Inflation and the Rand



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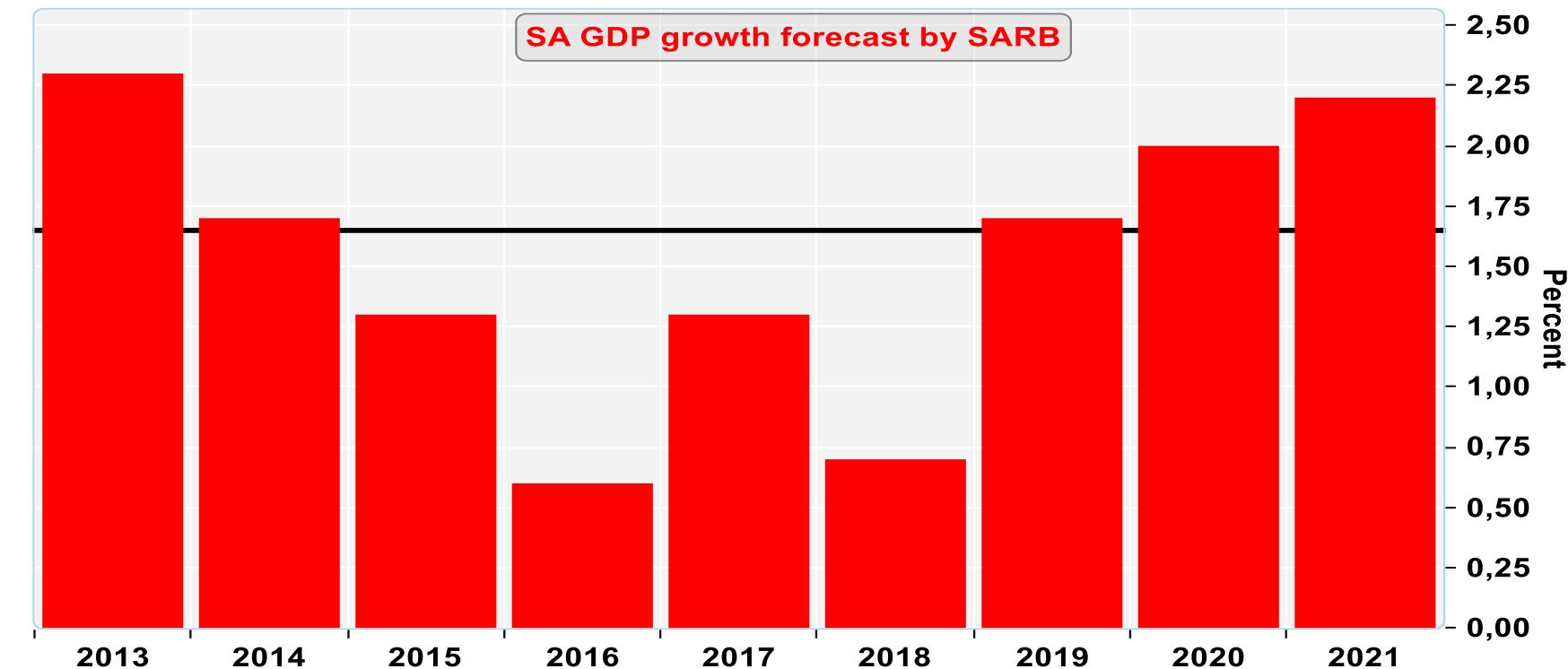
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Growth history & forecast from SARB.

Private sector average for this year is 1,1% and 1,9% next



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- 2019 SA may get to 1% growth but due to Eskom & Rand; inflation will increase to around 5% - no rate relief
- Consumer may start coming back near 2nd half of the year.
- Election years are difficult as one extra holiday and build-up to elections creates uncertainty.
- Moody's could downgrade SA by Mid 2019.
 - Rand may tank a little due to downgrades
- Unemployment will increase to closer to 30% by end 2019 or early 2020
- JSE will probably not go anywhere until after elections and downgrade.
 - Consumer stocks may start pricing in recovery toward year end but unemployment may make the forecast difficult.
 - JSE firms continue to invest in Africa and elsewhere.
 - Pay-off still a year or three away.
- The “Zuma” disaster lingers still but much less so.

- Some analysts not predict that 2020 starts with US recession.
 - But S&P should have already lost value and stocks increase again in 2nd half of the year.
- World looks shaky overall as the current slowdown may real hurt 2020 indicators.
 - (Remember things take time)
- SA growth may start increasing again but not yet sustainably to 3%.
 - SA growth may be more than 2% in 2020.
 - Interest Rates may have peaked by 2020
- SA may start facing up to crisis sometime after 2020/1



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**We will get to grow and see the lights
again. It may not be now but a few
quarters away**

Thank you.