



CONSEQUENCES ON MEASURING ADEQUACY AND SUSTAINABILITY IN SOCIAL SECURITY AFTER PANDEMIC

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AGENDA

- Sustainability and Adequacy
- Indicators of Adequacy
- Adequacy of Italian Disabled Workers' benefits: a Case Study

SUSTAINABILITY AND ADEQUACY

What is
Adequacy?

SUSTAINABILITY AND ADEQUACY



EP, 2015

“The ADEQUACY of pensions is measured by their ability to prevent poverty and by the degree to which they match the level of pre-retirement income”



IMF, 2022

“The SUSTAINABILITY of a public pension system may be defined as if it will not run into prolonged or permanent financing constraints over a long horizon”

INDICATORS OF ADEQUACY

INDICATORS OF ADEQUACY

BIG MAC INDEX



$$BigMac_{Country\ x} = \frac{BigMacPrice_{Country\ x, Home\ Currency}}{BigMacPrice_{USA, USD}}$$

$$BigMac_{ITA, Jan2025} = 0,98$$

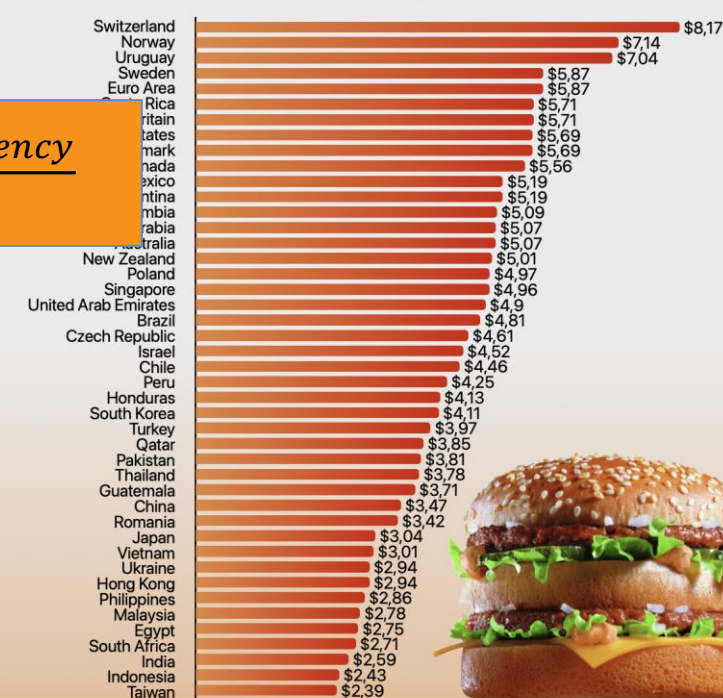
$$\frac{EUR}{USD} = 0,95$$

⇒ *EUR OVERVALUED*
(Purchasing Power Parity)

The Economist

The Big Mac Index

Worldwide price in US dollars of a Big Mac in January 2024 by country



Source : The Economist & Statista - January 2024

@tommydouziech

INDICATORS OF ADEQUACY

MODIFIED BIG MAC INDEX



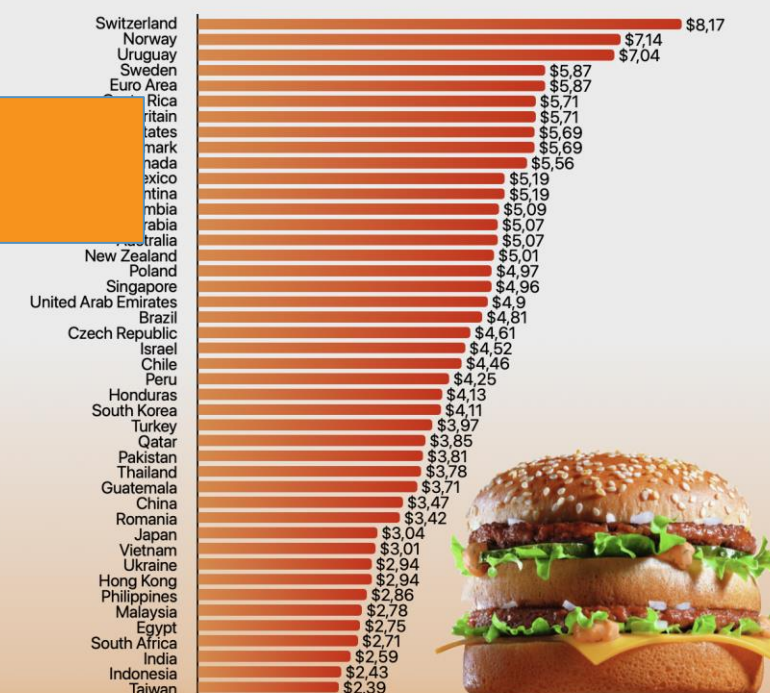
$$BigMac_{Country\ x} = \frac{BigMacPrice_{Country\ x, USD}}{BigMacPrice_{USA, USD}}$$

How many BigMac can you purchase in the USA with the BigMac value of your country?

The Economist

The Big Mac Index

Worldwide price in US dollars of a Big Mac in January 2024 by country



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INDICATORS OF ADEQUACY

BIG MAC INDEX FOR MONTHLY MINIMUM PENSIONS



$$BigMac (Min. Pens.)_x = \frac{Minimum Pension_{x,USD}}{BigMacPrice_{x,USD}}$$

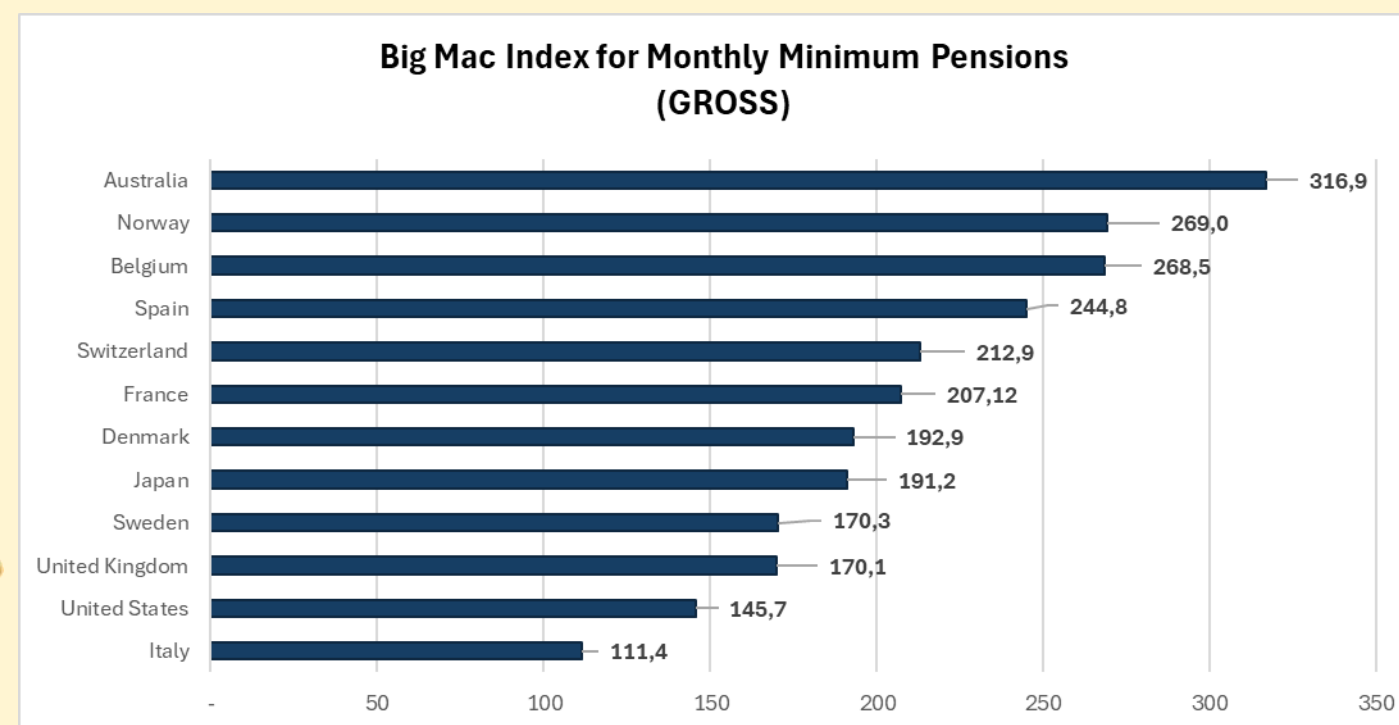
GROSS

NET

How many BigMac can you purchase with a monthly minimum pension in your country?

INDICATORS OF ADEQUACY

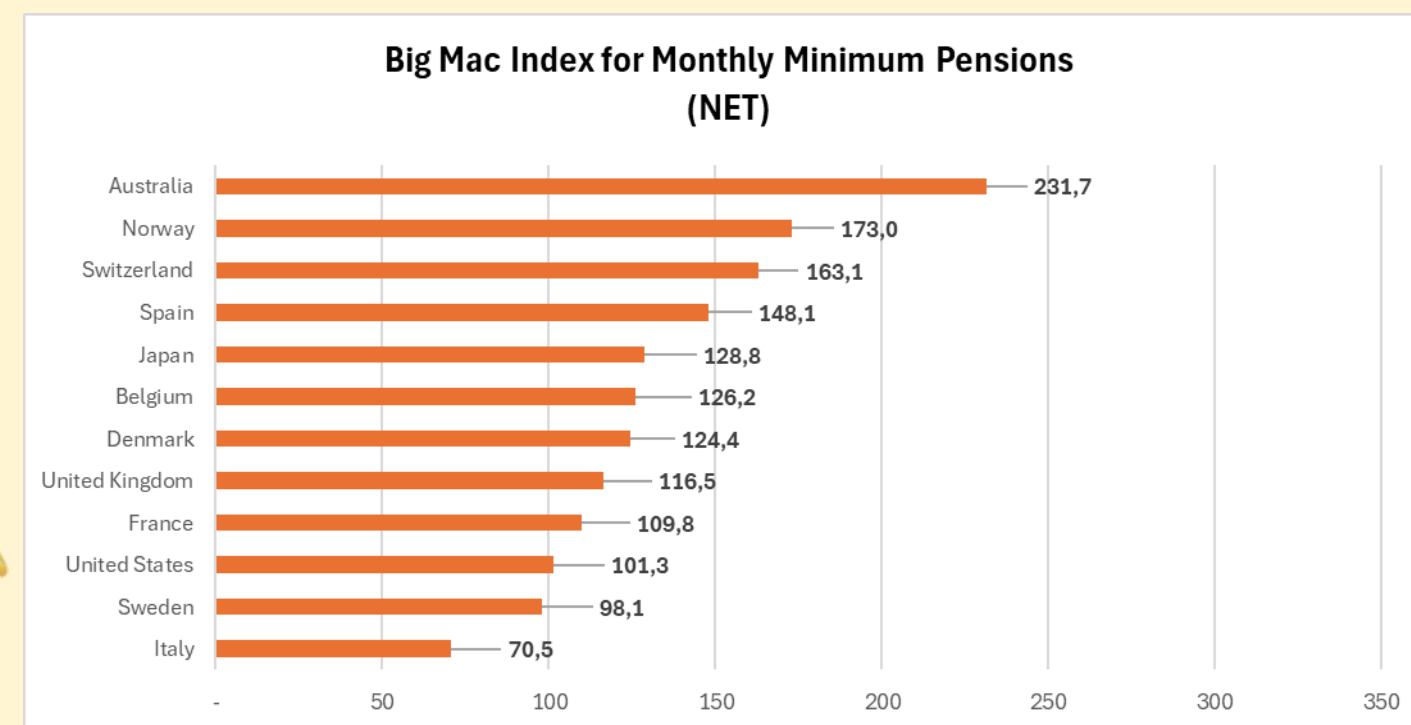
GROSS BIG MAC INDEX FOR MONTHLY MINIMUM PENSIONS



**How many BigMac can you purchase with the gross monthly minimum pension
in your country?**

INDICATORS OF ADEQUACY

NET BIG MAC INDEX FOR MONTHLY MINIMUM PENSIONS



How many BigMac can you purchase with the net monthly minimum pension in your country?

INDICATORS OF ADEQUACY

THEORETICAL REPLACEMENT RATE

$$TRR = \frac{P_{spa}}{W_{spa-1}}$$

GROSS TRR

NET TRR

- TRR = *Theoretical Replacement Rate*;
 spa = *standard pensionable age*;
 P_{spa} = *annual Pension amount in the first year of retirement (at age spa)*;
 W_{spa-1} = *pre-retirement annual Wage (at age $spa-1$)*

How many PreRetirement Annual WAGES you can purchase
with your Annual PENSION

INDICATORS OF ADEQUACY

PENSION WEALTH

$$PW = \frac{\sum_{k=1}^{\omega} v^k p_{spa,k} P_{spa+k}}{W_{spa-1}}$$

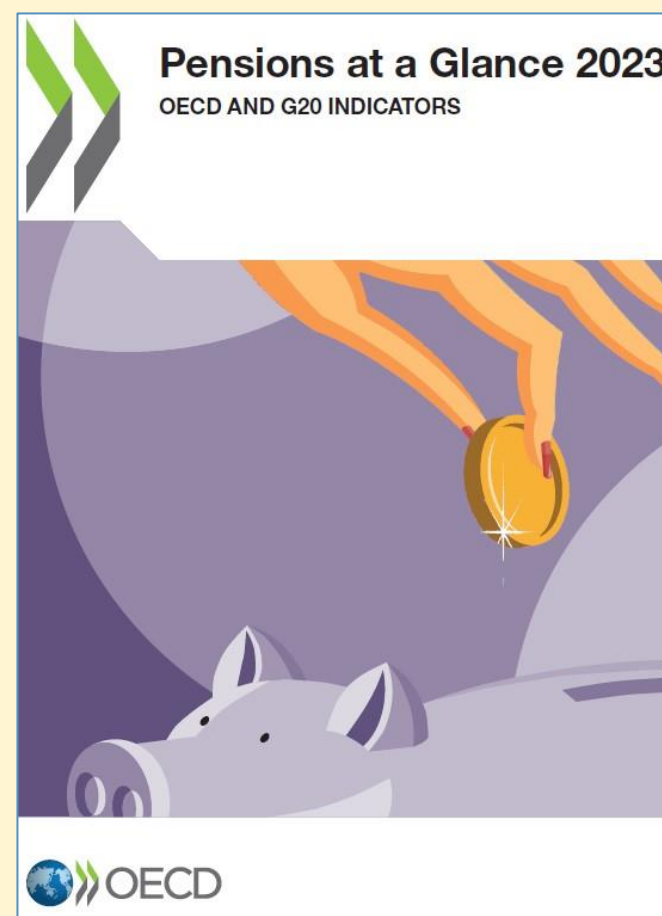
GROSS PW

NET PW

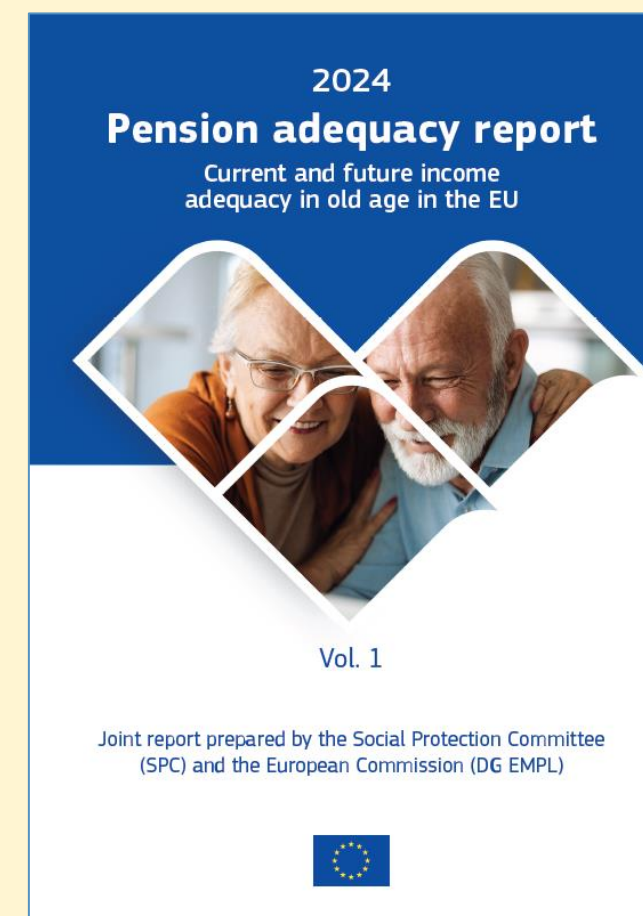
- PW = **Pension Wealth**;
 spa = **standard pensionable age**;
 v = **discount factor**;
 $p_{spa,k}$ = **Probability that an individual who retired at spa will survive k years**;
 P_{spa+k} = **annual Pension of an individual who retired at age spa surviving after k years**;
 W_{spa-1} = **pre-retirement annual Wage (at age $spa-1$)**

How many PreRetirement Annual WAGES you can purchase
with the present value of your Life PENSION

INDICATORS OF ADEQUACY



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ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: A CASE STUDY

ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: A CASE STUDY



A CASE STUDY
ON THE
DISABLED PENSION WEALTH INDICATOR

↓
MISSING
IN
ACTUARIAL LITERATURE



ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: A CASE STUDY



Assumptions (OECD, EC, MOF_{ITA})

- ❑ **Career Length:** 41 years (entry: 26y – retire: 67y)
 - ❑ **Coverage:** Italian disabled workers included in the mandatory compensation program
Aged 67 in 2023
 - ❑ **Demographic assumptions:** Inail disabled life tables, updated at 2019, 2021, 2023
 - ❑ **Economic assumptions:**
 - Price inflation = 2% per year
 - Real earnings = 1.25% per year on average
 - Discount rate = 2%
 - Average disabled workers' salaries
- ❑ **Taxes and Social security contributions:** As for by law respectively in 2019, 2021, 2023

ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: A CASE STUDY



DISABLED PENSION WEALTH

$$DPW = \frac{\sum_{k=0}^{\omega} v^k p_{spa,k} (P_{spa+k} + DB_{spa+k})}{W_{spa-1} + DB_{spa-1}}$$

GROSS
DPW

NET
DPW

DPW = Disabled Pension Wealth

Same as before plus:

DB_{spa+k} = annual Disability Benefit of a disabled worker who retired at age spa surviving after k years;

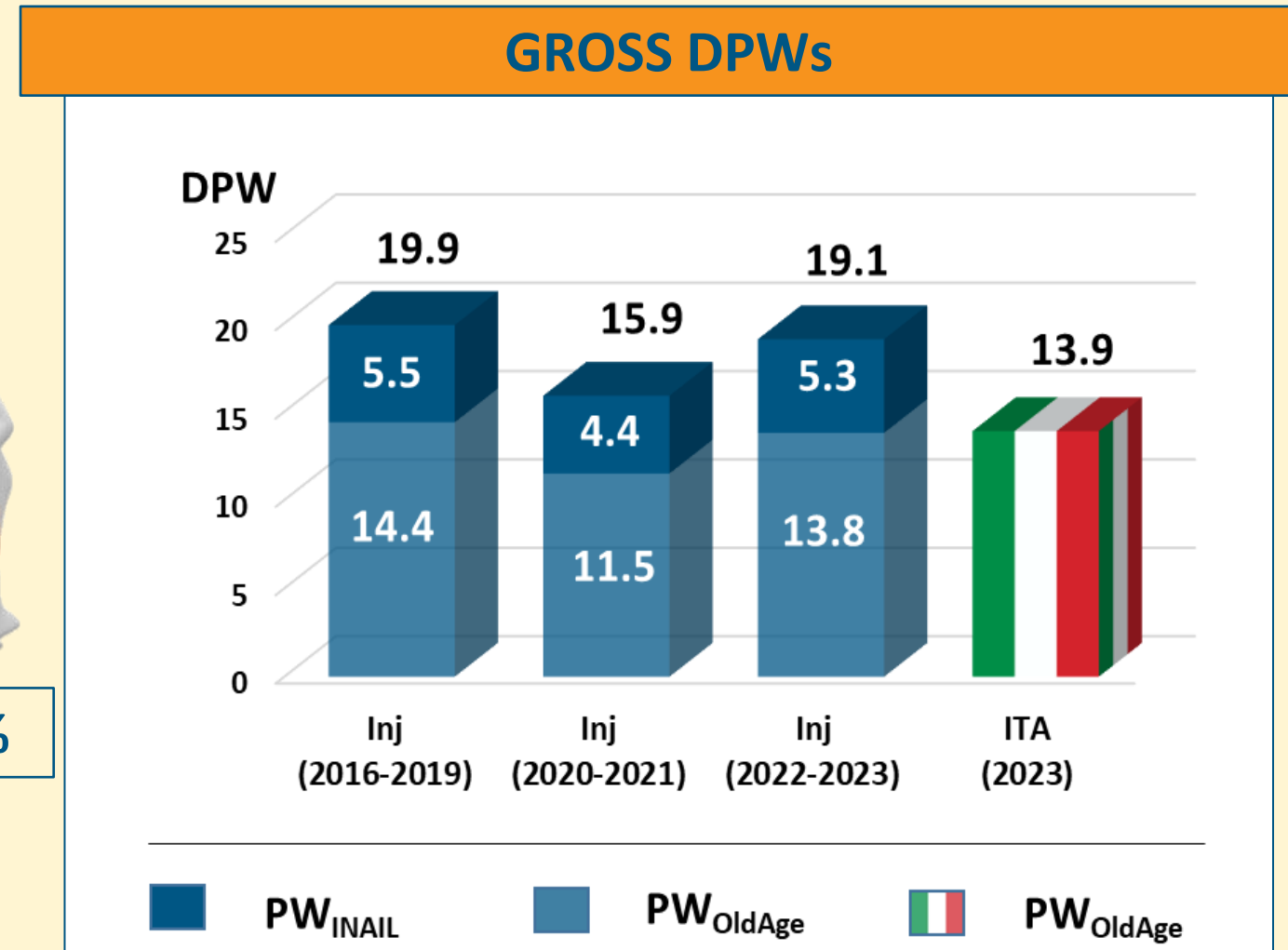
DB_{spa-1} = pre-retirement annual Disability Benefit (at age $spa-1$)

How many PreRetirement Annual DISABLED EARNINGS you can purchase with the present value of your global Life “DISABLED INCOME”

ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: A CASE STUDY



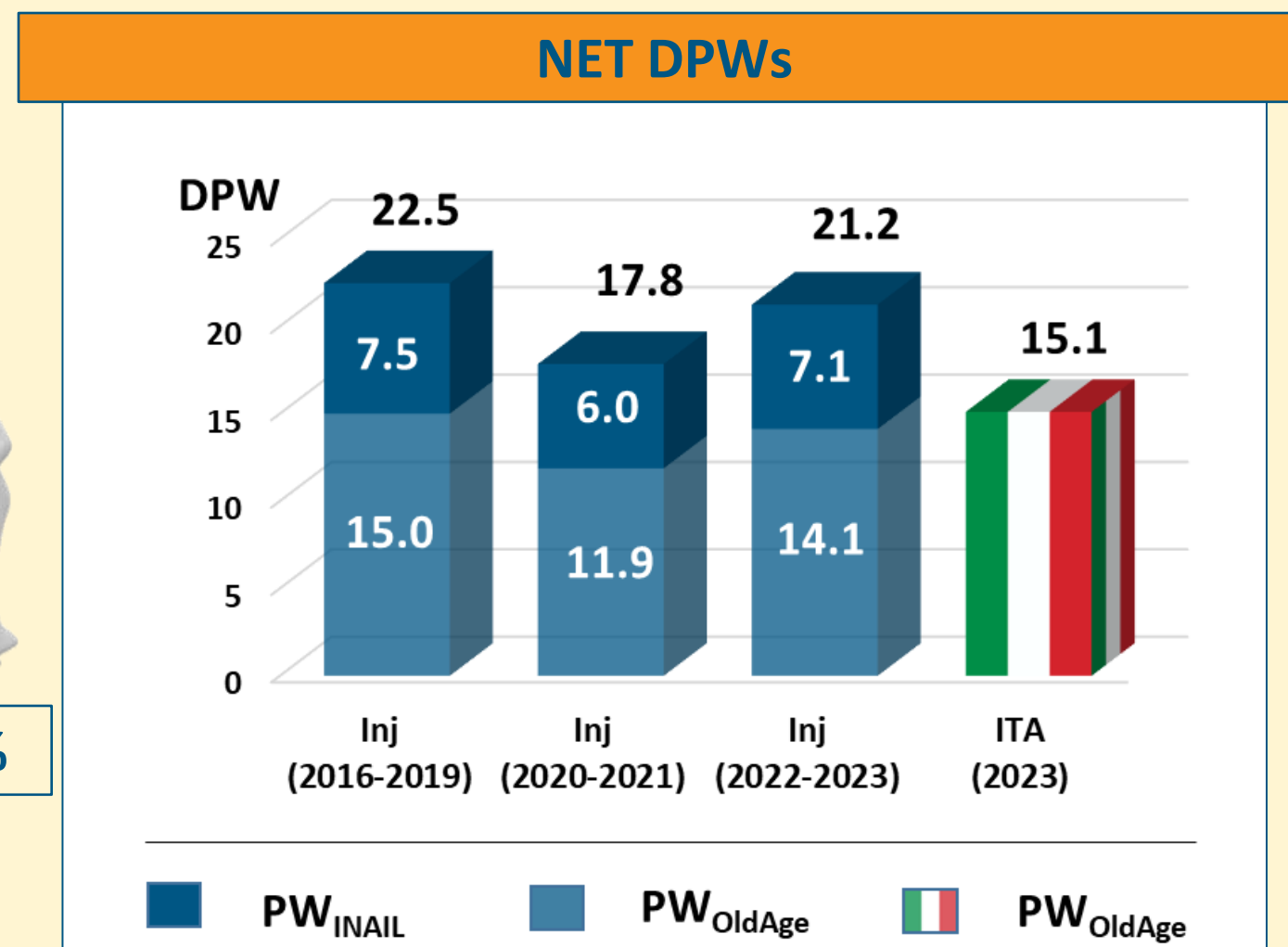
16%-60%



ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: A CASE STUDY



16%-60%



$$DPW = \frac{a(P + DB)}{W_{spa-1} DB_{spa-1}}$$

Gross DPW and Net DPW
16% - 60%
Average Variations

DPW_{INAIL}	DPW_{OldAge}	DPW
35%	3%	12%

ADEQUACY OF ITALIAN DISABLED WORKERS' BENEFITS: JUST FOR FUN



BIG MAC INDEX FOR MONTHLY DISABLED PENSION



$$BigMac (Disabled)_{ITA} = \frac{P_{Disabled,ITA,USD} + DB_{ITA,USD}}{BigMacPrice_{Italy,USD}}$$

$$GROSS = 429.85$$

$$NET = 414.28$$

How many BigMac can you purchase with a monthly disabled pension in Italy?

Thank you! Obrigado!

CONSEQUENCES ON MEASURING ADEQUACY AND SUSTAINABILITY IN SOCIAL SECURITY AFTER PANDEMIC

Questions?

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