POVERTY, EMPLOYMENT AND EDUCATION IN SOUTHERN AFRICA, 2020-2100

LABOR MARKETS IN SUBSAHARAN AFRICA NJD 2015 SSA REGIONAL EVENT
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MOTIVATION

- We know that the countries of Southern Africa, like much of Sub-Saharan Africa, have largely low-skilled workforces and are expecting demographic bulges
- To turn a demographic bulge into a demographic dividend, these extra people need to be working productively
  - Education should increase in the workforce to provide more human capital
  - Production technologies that can exploit the additional human capital need to be adopted
- If countries can't adapt to the demographic bulge, already poor countries could get poorer

Under "reasonable" assumptions,

what will be the challenges on the labor market to transforming the bulge into a dividend?

OUR APPROACH

- Take existing demographic projections as a given, and use these to model expected changes in the working age population
- Use micro data to understand how labor market and poverty ($2/day) outcomes vary according to the characteristics of the population
- Show how the evolving composition of the work force will affect unemployment and poverty in the coming decades
- Assess the role of education in the process
- Focus on Botswana, Lesotho, Namibia, South Africa and Swaziland

KEY CAVEATS UP FRONT

- The demographic projections come from the Wittgenstein Center
  - We use these instead of the UN projections because they provide more disaggregated figures
  - In particular, they model how education evolves, and education is an important determinant of labor market outcomes

- We make several important hypotheses about future behavior insofar as it relates to current behavior
  - We assume labor market behavior, conditional on characteristics, is stable over time
  - We assume poverty, conditional on characteristics and labor market status, is also stable
  - This implies that all dynamics come from changes in the composition of the labor force and job creation
  - We discuss the implications of some of the assumptions for the results
  - The results will typically ***not*** be robust to substantial modifications in these hypotheses

- We have a less intimate knowledge of the countries in question than many of you, so we are open to suggestions
  - We believe our assumptions to be reasonable (or at least feasible)
  - You may be able to suggest better alternatives
  - Our framework is flexible enough to adapt to a range of alternatives

MATHEMATICALLY: LFP AND UNEMPLOYMENT

- Start by estimating labor force participation at, say, 2050:

$$E(LFP|t=2050)=\int LFP(\text{age, sex, edu}|t=2050)f(\text{age, sex, edu}|t=2050)$$

- We assume $LFP(\text{age, sex, edu}|t=2050)$=$LFP(\text{age, sex, educ})\forall t$, so we start by estimating $LFP(\text{age, sex, educ})$
- Given the number of jobs J_{2010}, and a constant 10-year job growth rate r, we calculate the number of available jobs at 2050 as

$$E(J|t=2050)=J_{2010}(1+r)^{(2050-2010)/10}$$

- Unemployment in 2050 is simply

$$E(U|t=2050)=1-\frac{E(J|t=2050)}{E(LFP|t=2050)}$$

MATHEMATICALLY: POVERTY

- Estimate

$$Pov(\text{age,sex,edu,LMStatus}|t = 2050) = Pov(\text{age,sex,edu,LMStatus})$$

- Use LFP and unemployment estimates to remove conditioning on LMStatus

$$Pov(\text{age,sex,edu,}|t = 2050) =$$
$$Pov(\text{age,sex,edu,LMStatus=OLF})\big(1 - LFP(\text{age,sex,edu}|t = 2050)\big)$$
$$+Pov(\text{age,sex,edu,LMStatus=Unemp})LFP(\text{age,sex,edu,}|t = 2050)U(t = 2050)$$
$$+Pov(\text{age,sex,edu,LMStatus=Emp})LFP(\text{age,sex,edu,}|t = 2050)\big(1 - U(t = 2050)\big)$$

- Integrate over the distribution of characteristics in 2050 to get

$$E(Pov|t = 2050) = \int Pov(\text{age, sex, edu}|t = 2050)f(\text{age, sex, edu}|t = 2050)$$

METHODOLOGY

- Estimate employment and labor force participation rates as functions of age, sex and education in each country
  - There is no point in conditioning on other variables, such as urban/rural status, unless we can add internal migration patterns for our countries to the projections
  - Similarly, changes in household size/composition are not included, as we have no projections for how these will evolve in our countries (although there are general results)
  - As all covariates are discrete, the nonparametric estimator is simply the share in the employed or participating in the cell

- Estimate (consumption) poverty rates as a function of age, sex, education and employment status (employed, unemployed, OLF) in each country
  - Poverty is defined at the household level, but we need individual level estimates
  - Using an equivalence scale that assigns 0.5 weight to children under 15, calculate consumption per unit and compare to a $2/day threshold
  - Assign this value (poor/not poor) to all household members for the estimation
  - Calculate the nonparametric estimate of the conditional poverty rate in each cell

METHODOLOGY

- Use the Wittgenstein Center projections to predict how the composition of the working age population evolves at 10-year intervals between 2020 and 2100 by age, sex and level of education

- Calculate the expected labor force using estimated LFP rate and the distribution of population characteristics at each date

- Under various assumptions about job creation rates, calculate the implications for employment
  - Job creation at a rate sufficient to maintain the overall unemployment rate constant (accounts for changes in population size and overall LFP)
  - Job creation at the same rate as the average observed in each 10-year interval in the range 2000 to 2013

- Using the estimated distributions of employment and workforce characteristics, derive the implications for poverty using the estimated conditional poverty rates

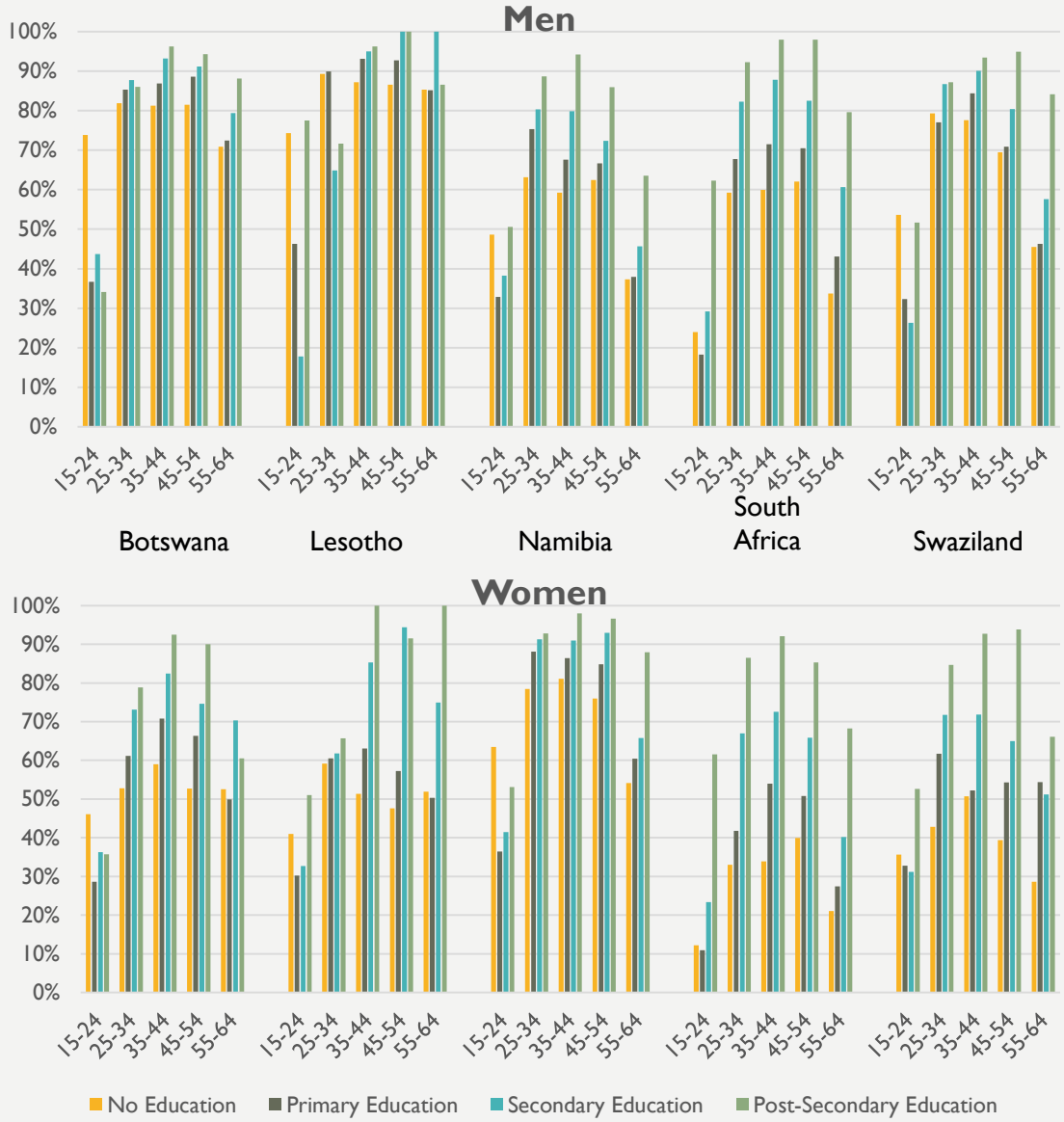
MICROECONOMIC DATA USED

Country	Data Source
Botswana	HBS 2010
Lesotho	CMS 2010
Namibia	IES 2010
South Africa	LFS 2013, IES 2010 for poverty*
Swaziland	IES 2010

- Note: these are surveys, not censuses, and are thus subject to sampling variation

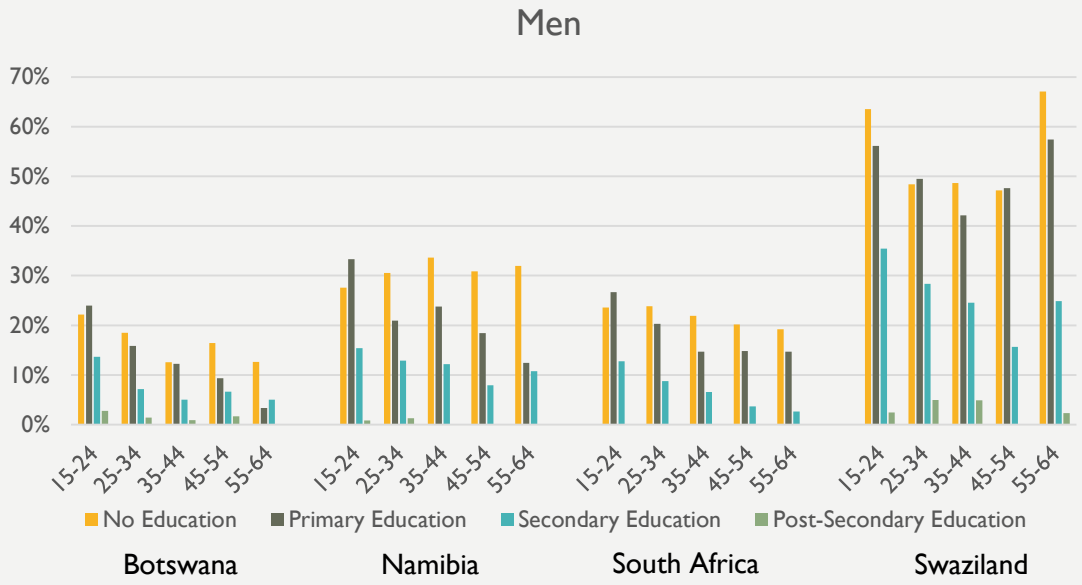
* In the South African IES, one cannot distinguish unemployed from out of labor force.

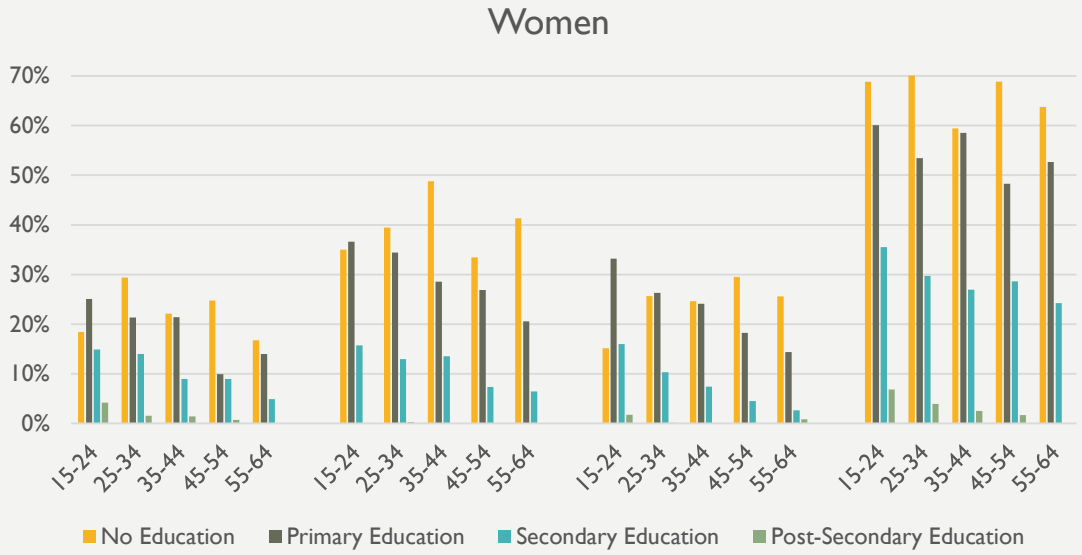
LABOR FORCE PARTICIPATION



- Male LFP typically higher than female LFP in all countries
- With the exception of the youngest age group, labor force participation increases with education
- LFP typically increases, then decreases with age

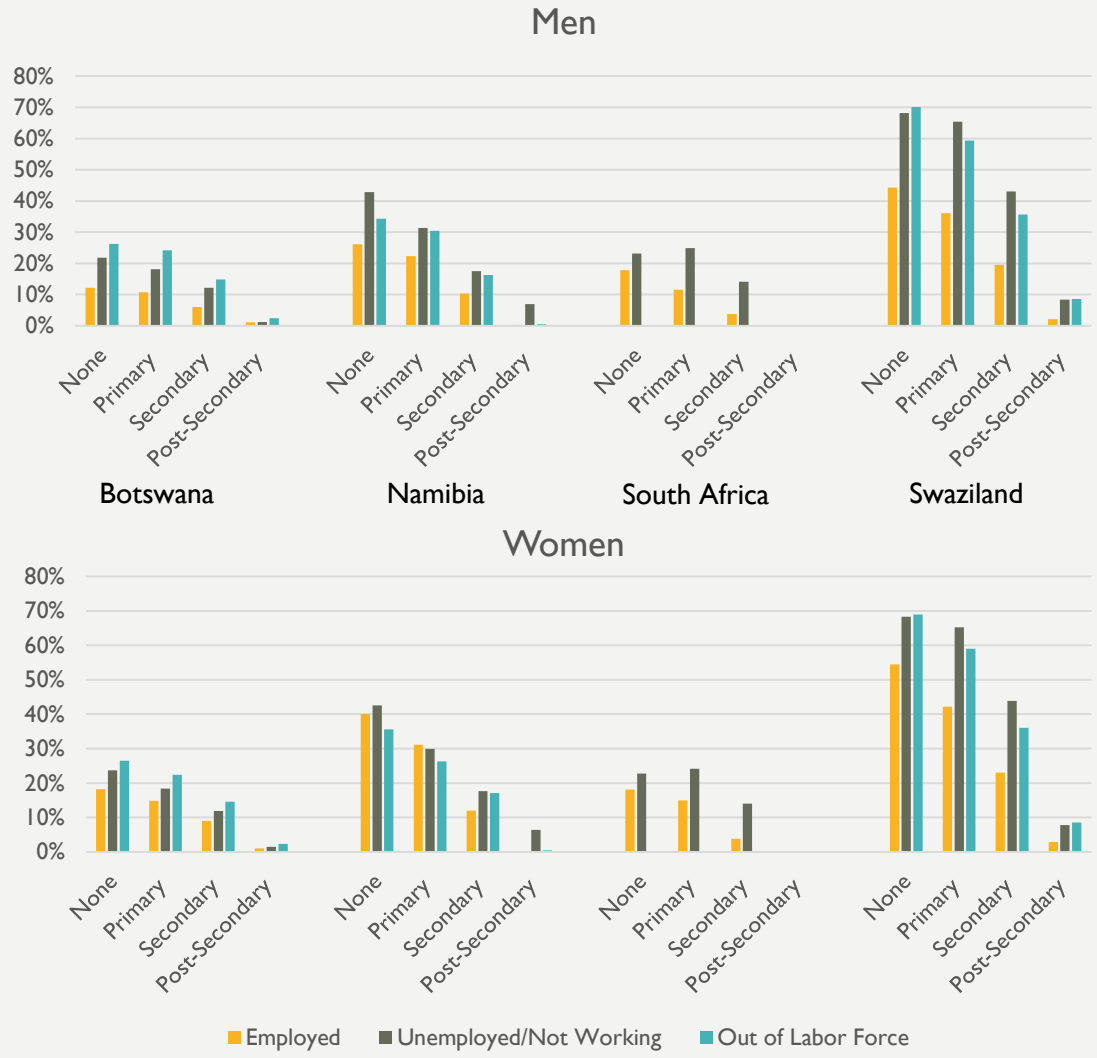
POVERTY DEMOGRAPHICS





- Poverty falls with education in all countries
- The age profile of poverty varies across countries and genders
- Swaziland has the highest poverty rates, Botswana the lowest
- We are still working on calculating consumption poverty rates in the Lesotho data

POVERTY, EDUCATION AND LABOR MARKET STATUS



- Regardless of the labor market state, more educated individuals are less often poor
- Clearly, employment is associated with lower poverty for all groups but low-educated Namibian women
- There is also a distinction in poverty rates between the unemployed and those out of the labor force (when measurable), but not consistent across countries

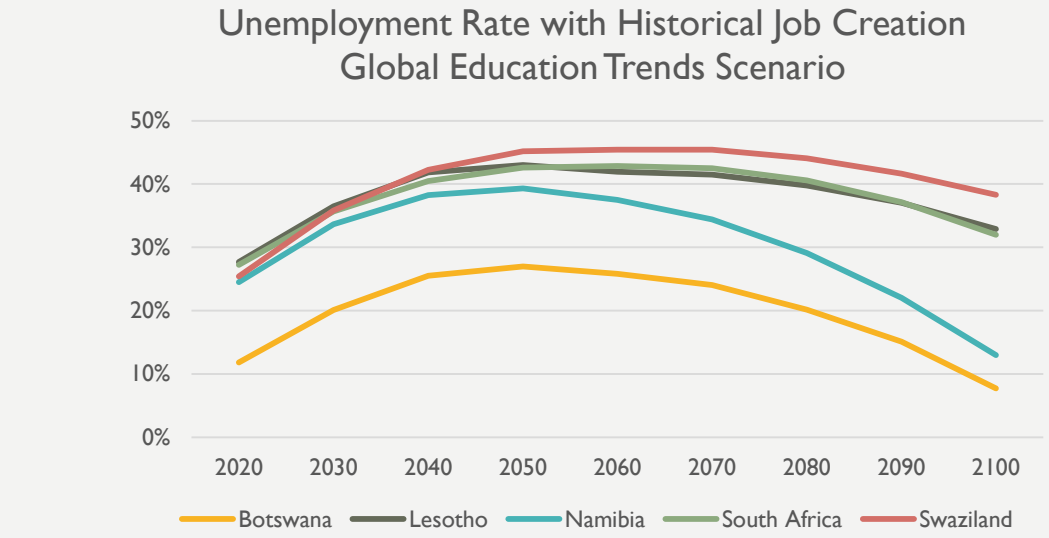
PROJECTIONS

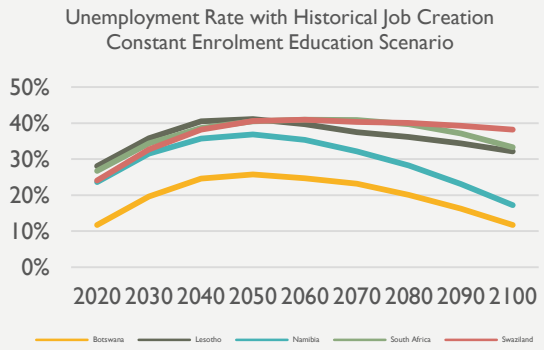
- The Wittgenstein Center demographic projections* are based on country-specific models for
  - Fertility
  - Mortality
  - Migration
  - Education

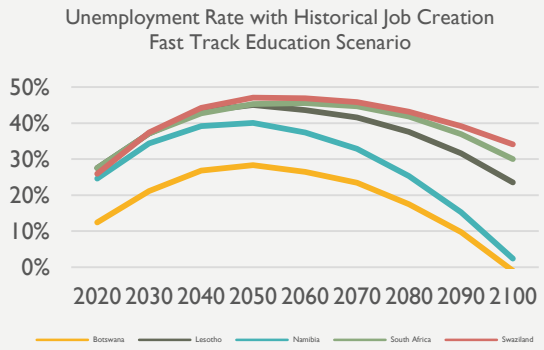
- Education in the projections is based on one of 3 different models about how education will evolve:
  - **Constant enrolment rate**: the share of the population in each educational category remains constant over the length of the projection period (conservative)
  - **Global educational trends**: the share of the population in each educational category converges to the global average (average)
  - **Fast track**: the share of the population in each educational category evolves at the fastest rate seen in the recent historical data on education, i.e. that of East Asian countries (optimistic)

* http://www.oeaw.ac.at/vid/dataexplorer/

OVERALL IMPLICATIONS FOR UNEMPLOYMENT

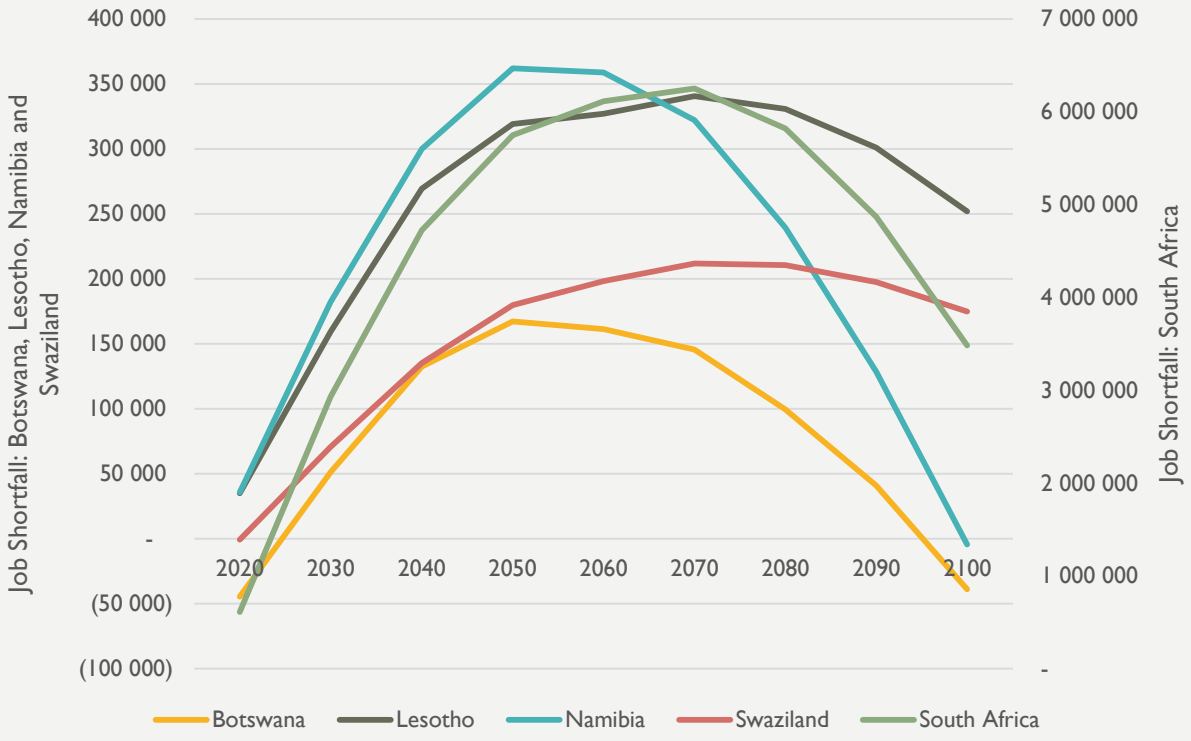






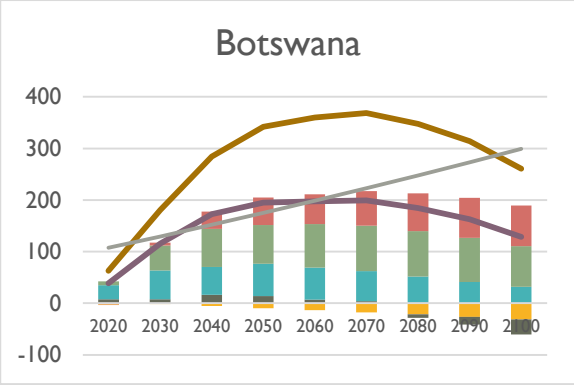
- All countries in the region would see unemployment rise, even if job creation continued at historical rates
- Some countries (Botswana, Namibia) would have lower unemployment at the end of the period than the beginning of the period, others not
- Although faster education improvements are associated with higher medium-range unemployment, unemployment rates fall more in the long term (2100) in all countries, especially Botswana and Namibia

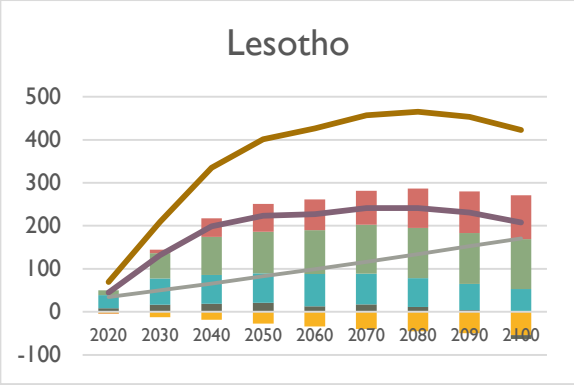
JOB SHORTFALL: HISTORICAL CREATION RATE

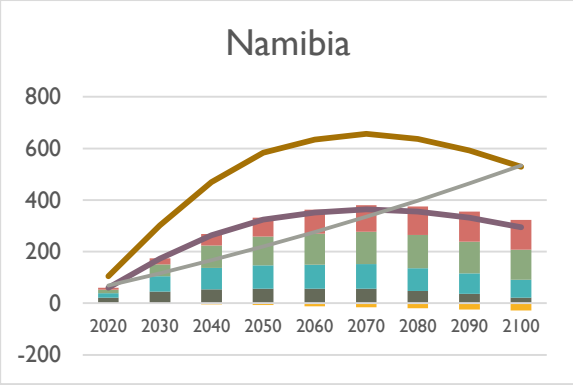


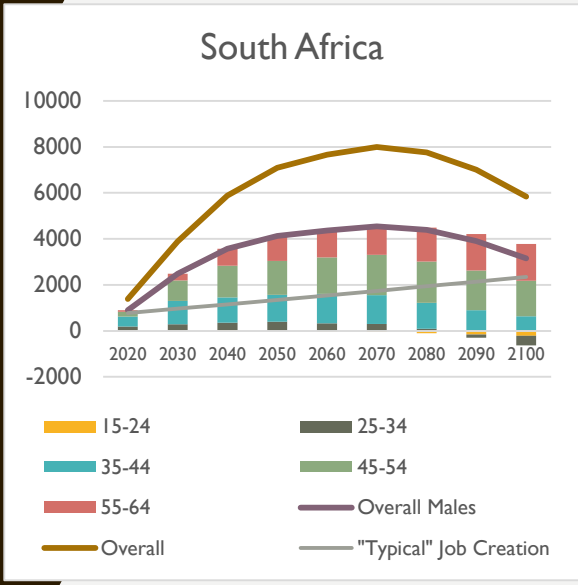
- If job creation continues at historical rates, no country would create enough jobs to employ all of the new workers
- The problem is quantitatively smallest in Botswana: only missing 167,000 jobs at the peak
- South Africa, the largest country in the region, would need 6.25 million more jobs than would normally be created, just to keep unemployment at current levels
- Clearly, there is a need to spur job creation in the medium term

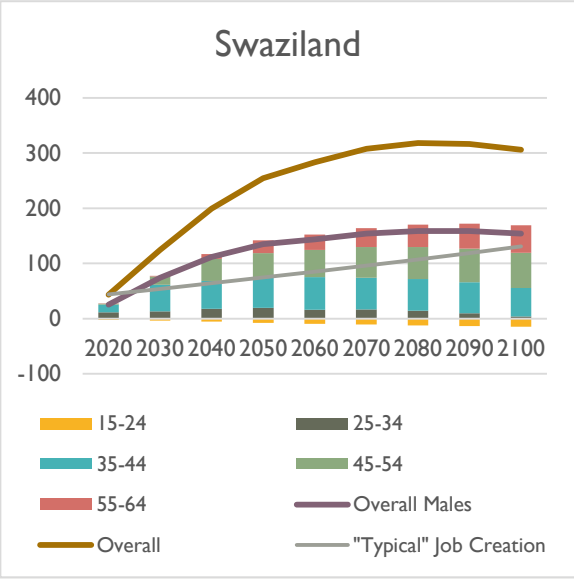
LABOR FORCE & JOB CREATION: AGE STRUCTURE (MEN)





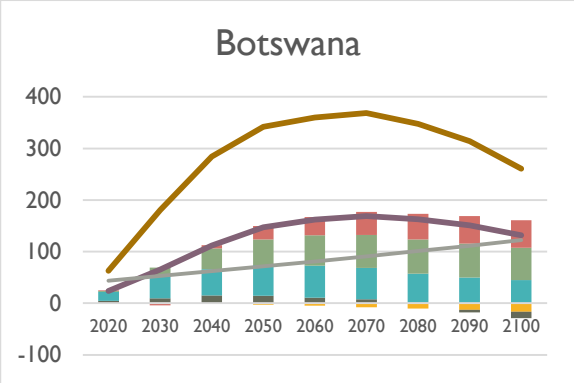


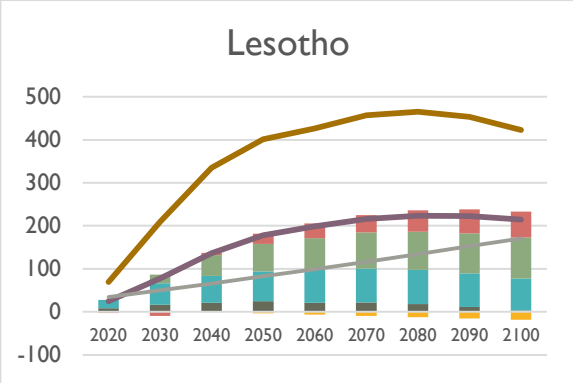


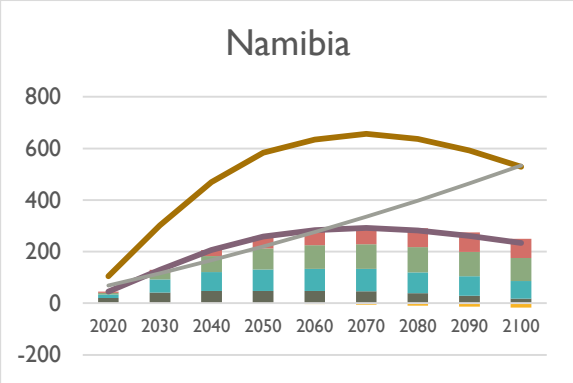


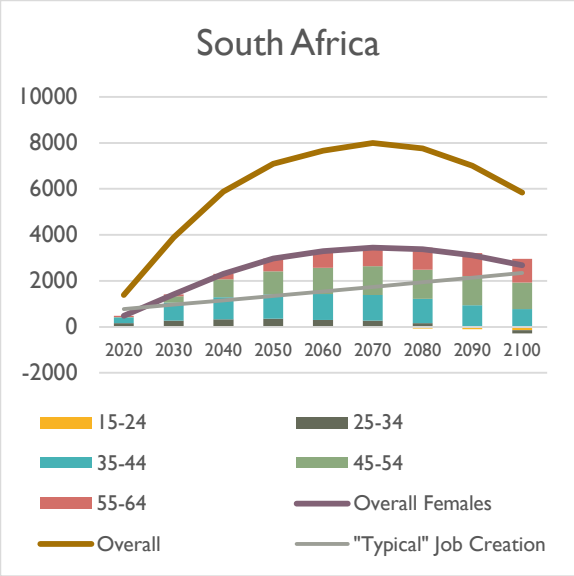
- Initially, the employment pressure will be felt by the 35-44 year old cohort, then the 45-54 and 55-64 year olds
- There would be more jobs than people currently employed in the youngest cohorts toward the end of the period, so some reallocation would need to occur across age groups
- Only in Botswana and Namibia does job creation (if maintained at current rates) cover labor force growth by the end
- In Lesotho and South Africa, job creation does not even cover male labor force growth

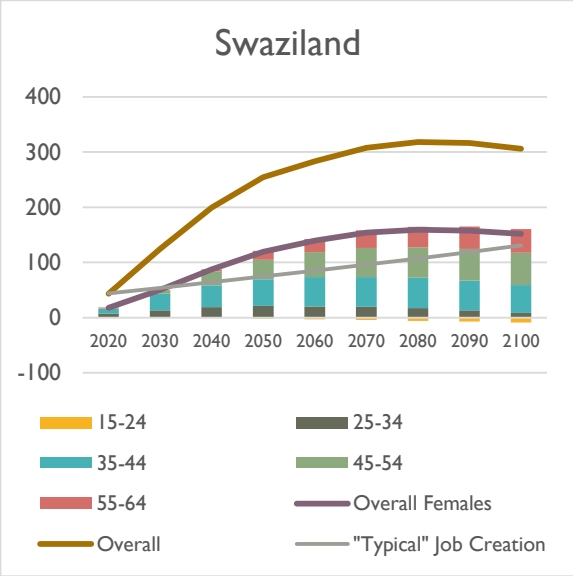
LABOR FORCE & JOB CREATION: AGE STRUCTURE (WOMEN)





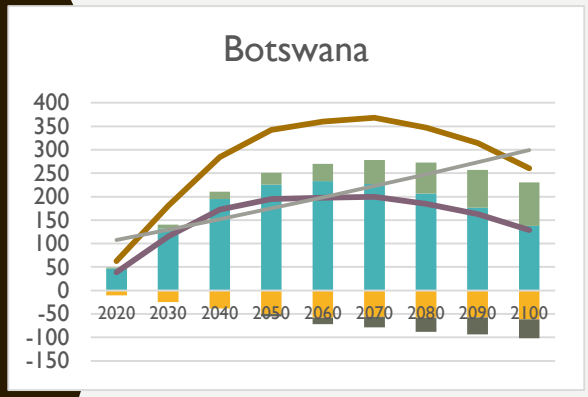


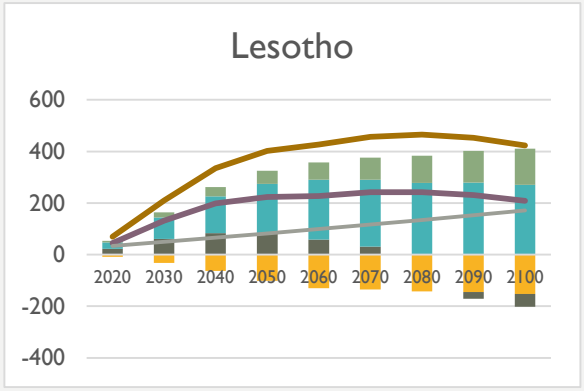


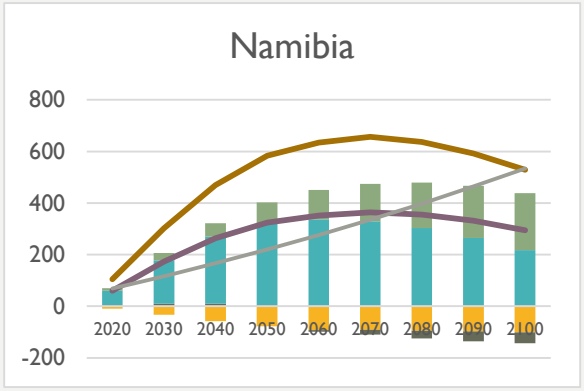


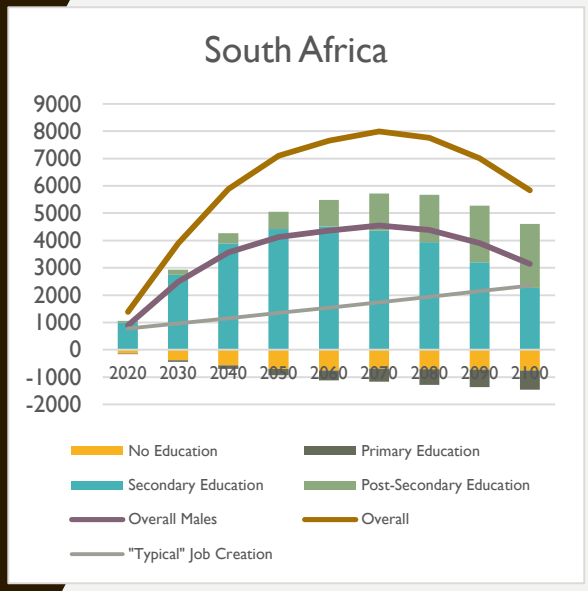
- Quite similar to men
- Since youngest cohorts do not shrink as fast in the long term for women as they do for men, there is less opportunity to reallocate young women's jobs to older women in the workforce.
- Unlike for men, historical job creation rates would be enough to cover the growth in the female labor force in South Africa

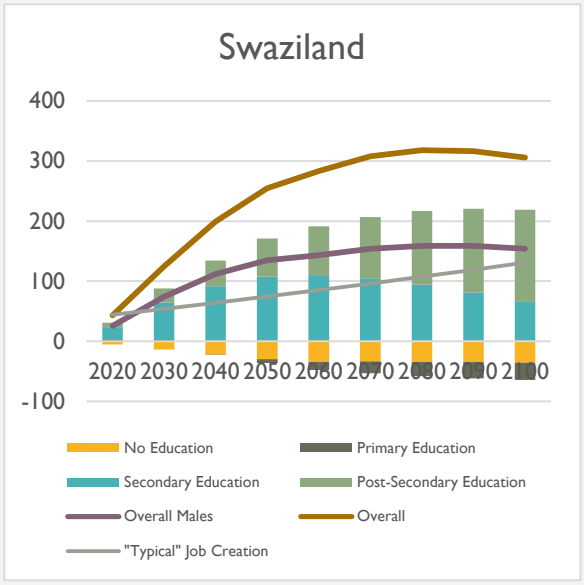
LABOR FORCE & JOB CREATION: EDUCATION (MEN)





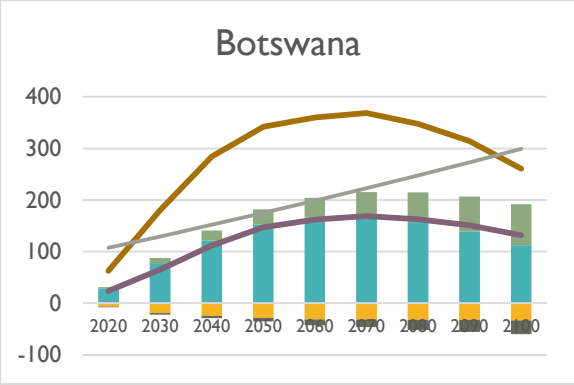


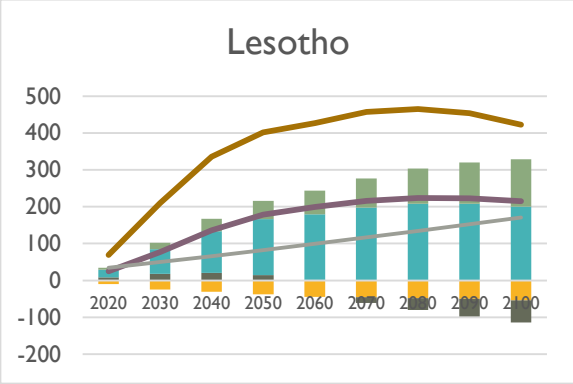


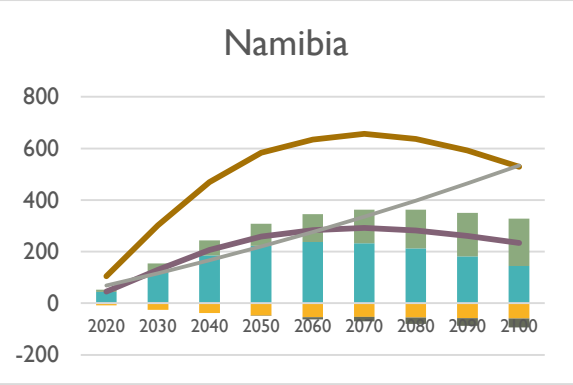


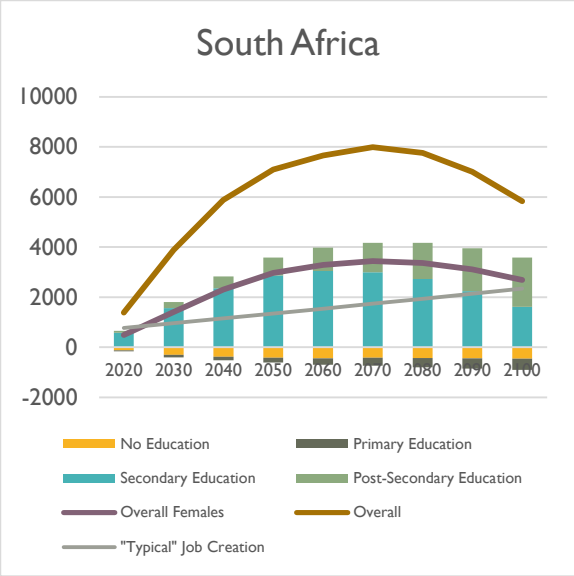
- Jobs become increasingly occupied by people with a secondary education
- The shift in the education structure of labor supply means one of two things:
  - Either the structure of jobs adapts and the skill requirements of firms increase in line with the supply of skills provided, or
  - The structure of jobs does not adjust fast enough
- If the structure of jobs does not adjust fast enough:
  - The pool of unemployed will become increasingly comprised of more skilled workers
  - Employment services will need to adapt their methods
  - Overskilling will become prominent
  - Excess demand for low skilled individuals can bid up their wages and pull some out of poverty
- These phenomena are visible in all countries in the region, although Lesotho might see the largest effects

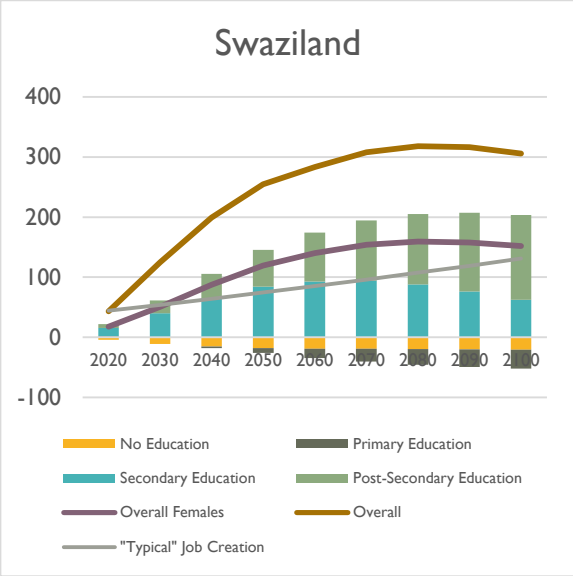
LABOR FORCE & JOB CREATION: EDUCATION (WOMEN)











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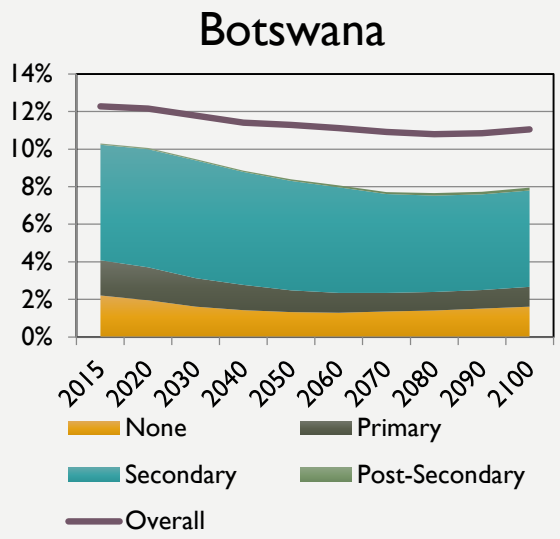
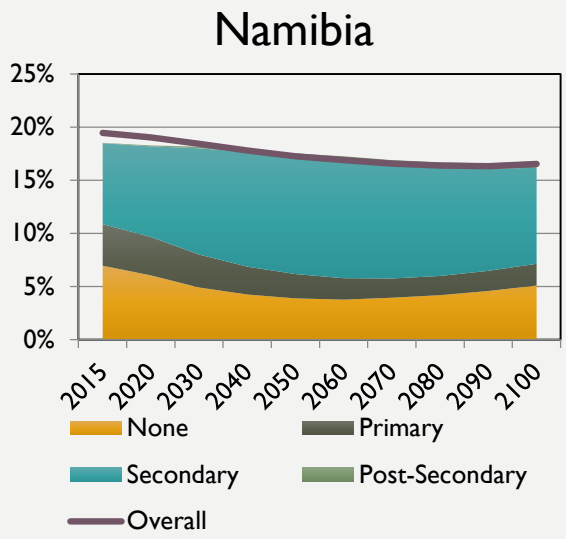
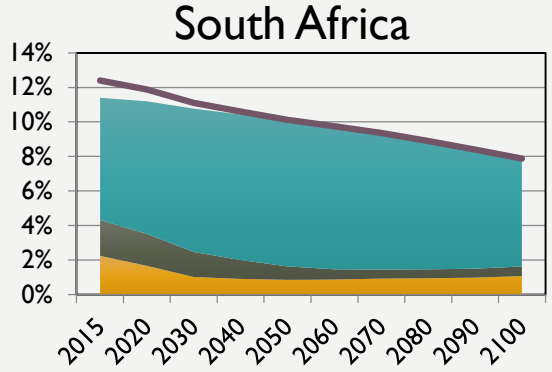
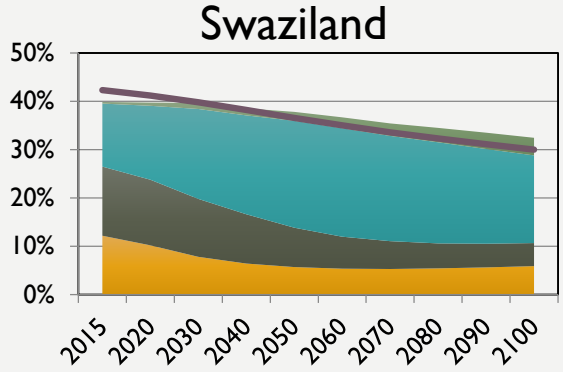
POVERTY WITH HISTORICAL JOB CREATION (MEN)



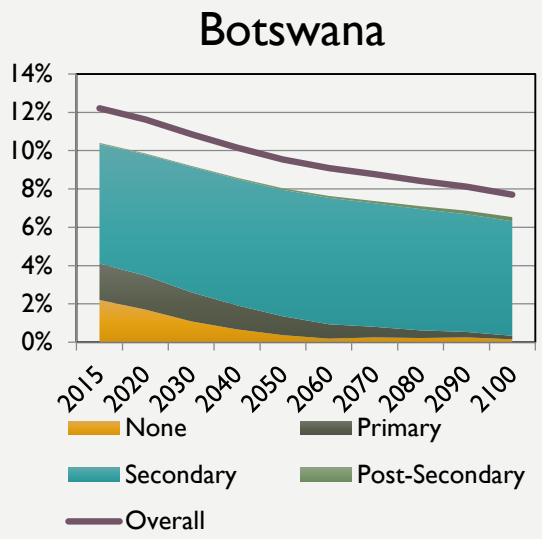


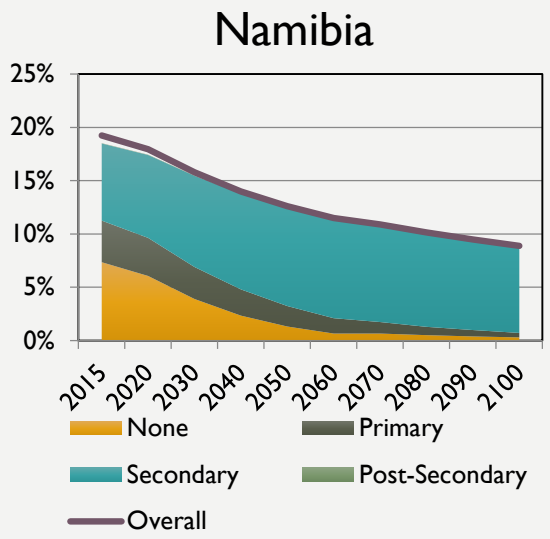


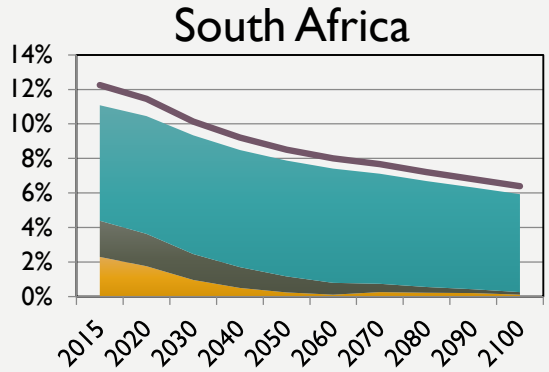


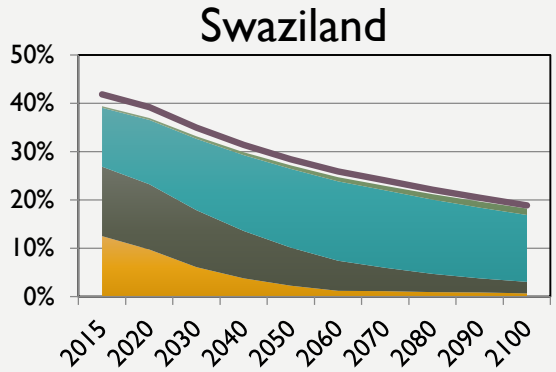
- In all countries, poverty is concentrated among those with a secondary education
  - The group starts much larger than post-secondary
  - It grows the fastest
  - LFP is relatively high
  - They suffer the most from unemployment
- This is under the GET scenario, so education is improving over time

POVERTY WITH CONSTANT UNEMPLOYMENT RATE (MEN)









- When job creation keeps pace with labor force growth, poverty reduction is much greater
- This is due to a shift of employment toward more productive jobs
- Here is a key dimension of "The Demographic Dividend"

CONCLUSIONS

- The demographic bulge will make efforts to reduce unemployment harder for prime age workers
- Countries need to spur job creation, especially South Africa, Namibia and Lesotho
- As the skill structure of the workforce will evolve, technology must evolve as well
- The stock of unemployed will be increasingly skilled, so programs need to be adapted
- It is not enough to raise the level of education to ensure a demographic dividend
- However, when there is investment in education and labor market develops to accommodate it, the demographic dividend can be huge (male poverty halved in Swaziland, for example)

THANK YOU

EDUCATION SHARES IN MICROECONOMIC DATA

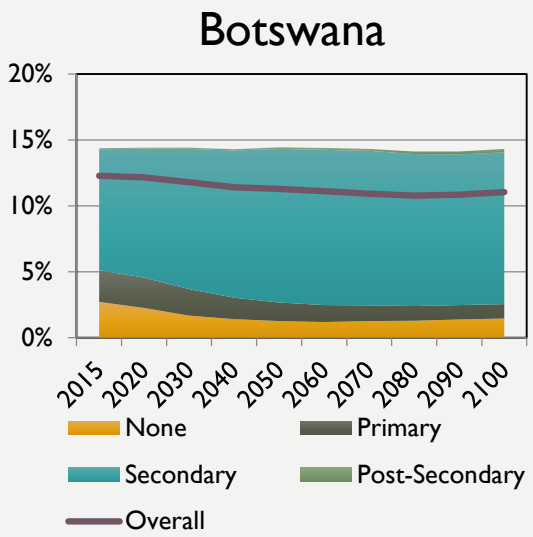
Men

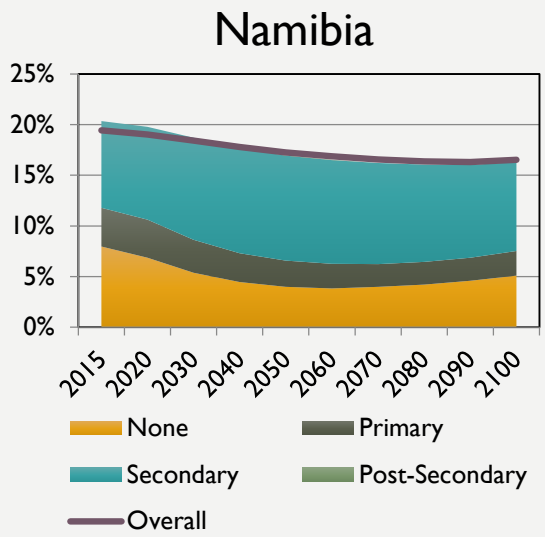
	Botswana	Lesotho	Namibia	South Africa	Swaziland
No Education	14.44%	15.25%	12.26%	3.39%	9.40%
Primary Education	19.88%	81.59%	28.59%	19.29%	31.44%
Secondary Education	50.06%	2.19%	52.00%	72.64%	47.18%
Post-Secondary Education	15.62%	0.97%	7.15%	4.68%	11.97%

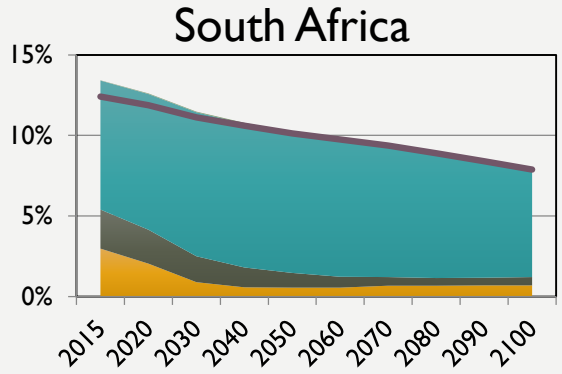
Women

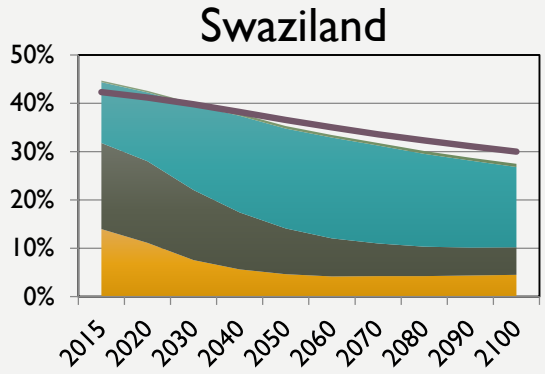
	Botswana	Lesotho	Namibia	South Africa	Swaziland
No Education	12.63%	3.41%	11.15%	4.79%	10.82%
Primary Education	21.23%	92.70%	24.78%	17.64%	29.63%
Secondary Education	52.97%	2.61%	57.56%	73.42%	49.72%
Post-Secondary Education	13.17%	1.29%	6.52%	4.15%	9.83%

POVERTY WITH HISTORICAL JOB CREATION (WOMEN)



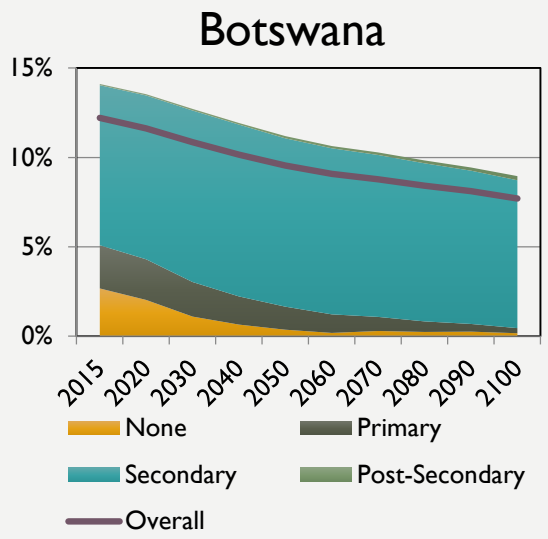


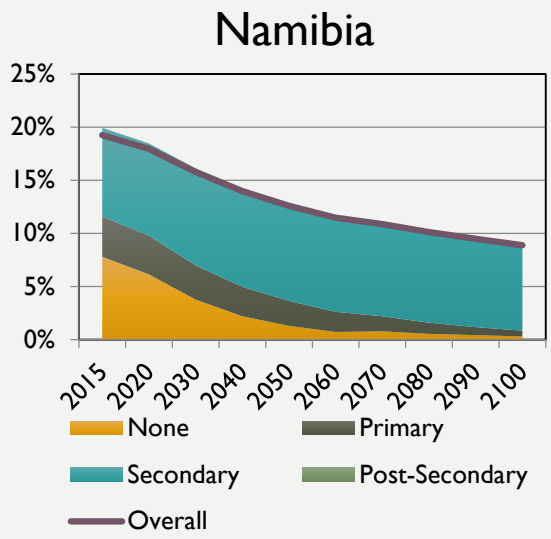


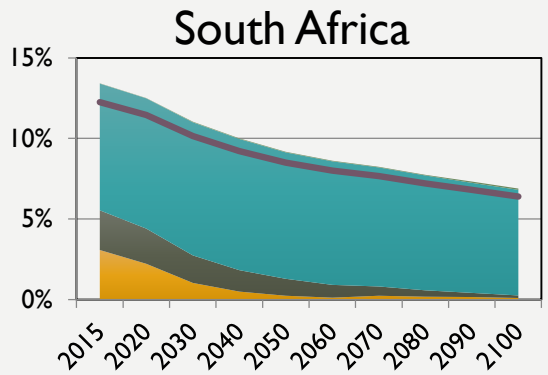


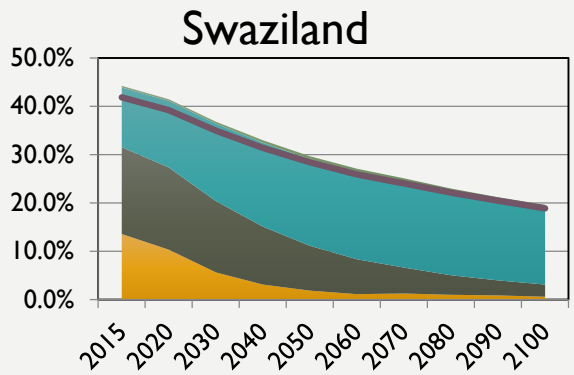
- In all countries, poverty is concentrated among those with a secondary education
  - The group starts much larger than post-secondary
  - It grows the fastest
  - LFP is relatively high
  - They suffer the most from unemployment
- This is under the GET scenario, so education is improving over time

POVERTY WITH CONSTANT UNEMPLOYMENT RATE (WOMEN)









- When job creation keeps pace with labor force growth, poverty reduction is much greater
- This is due to a shift of employment toward more productive jobs
- Here is a key dimension of "The Demographic Dividend"