



# GIS DATA: FILLING IN THE GAPS

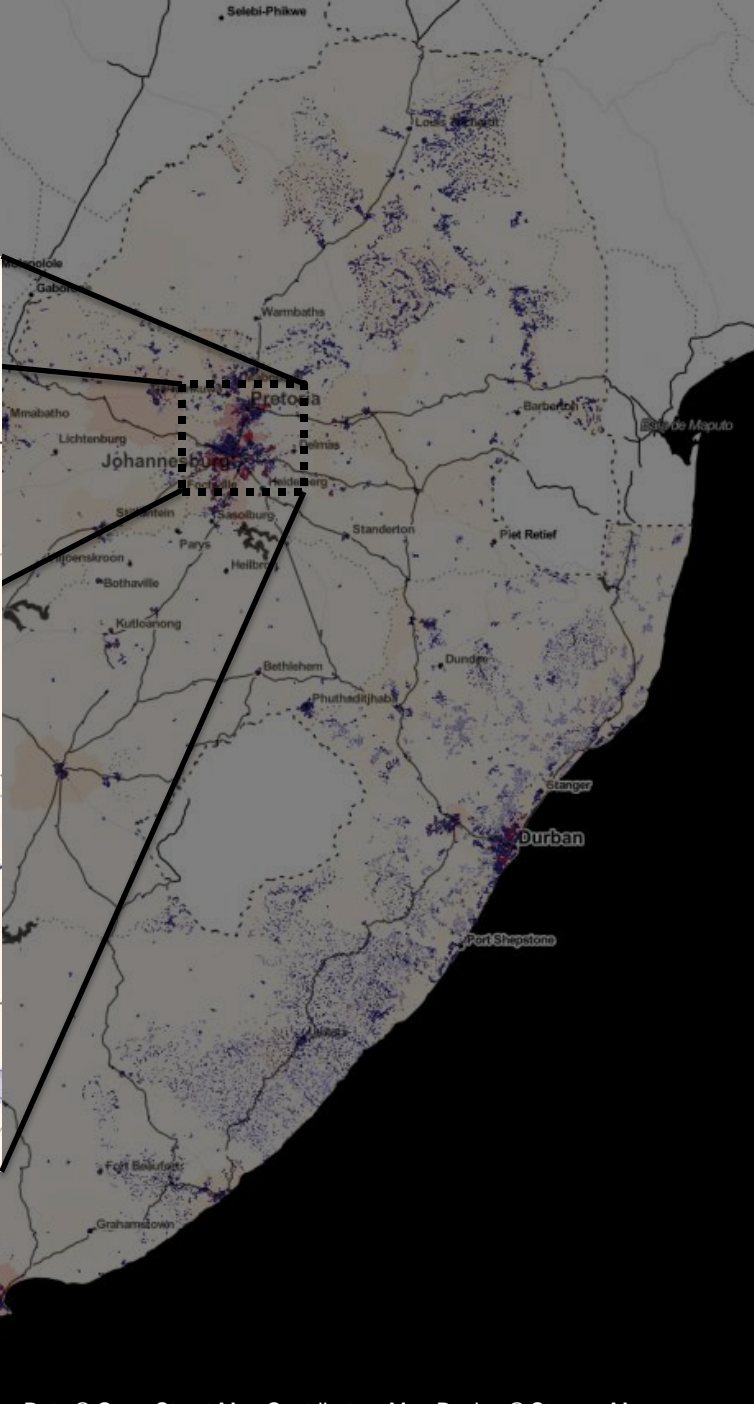
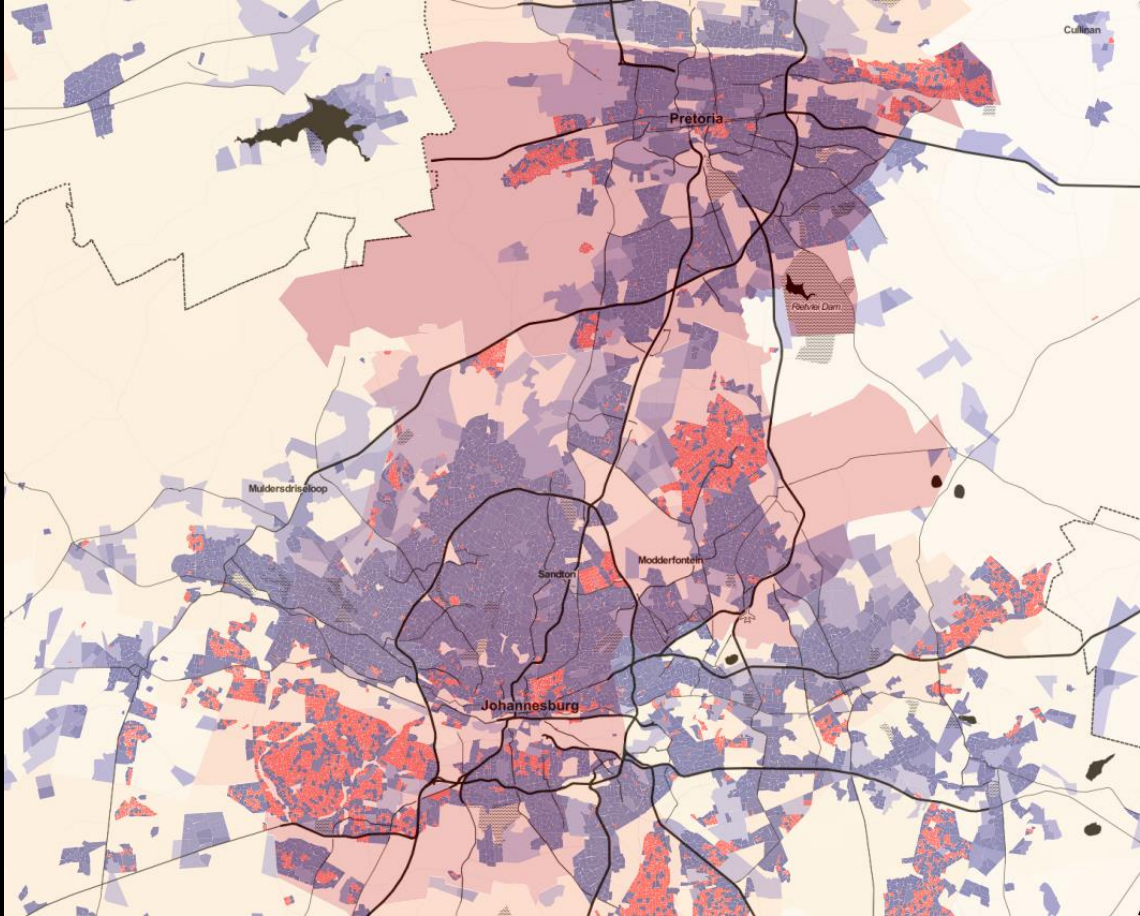
Can we use statistical models?

David Wilson, Senior Analyst  
November, 2014  
[david.wilson@ihs.com](mailto:david.wilson@ihs.com)

# Market Question

How many people live in Johannesburg today (mid 2014)?

Using Statistics Africa, 2014, say that population growth rate  
4.43m

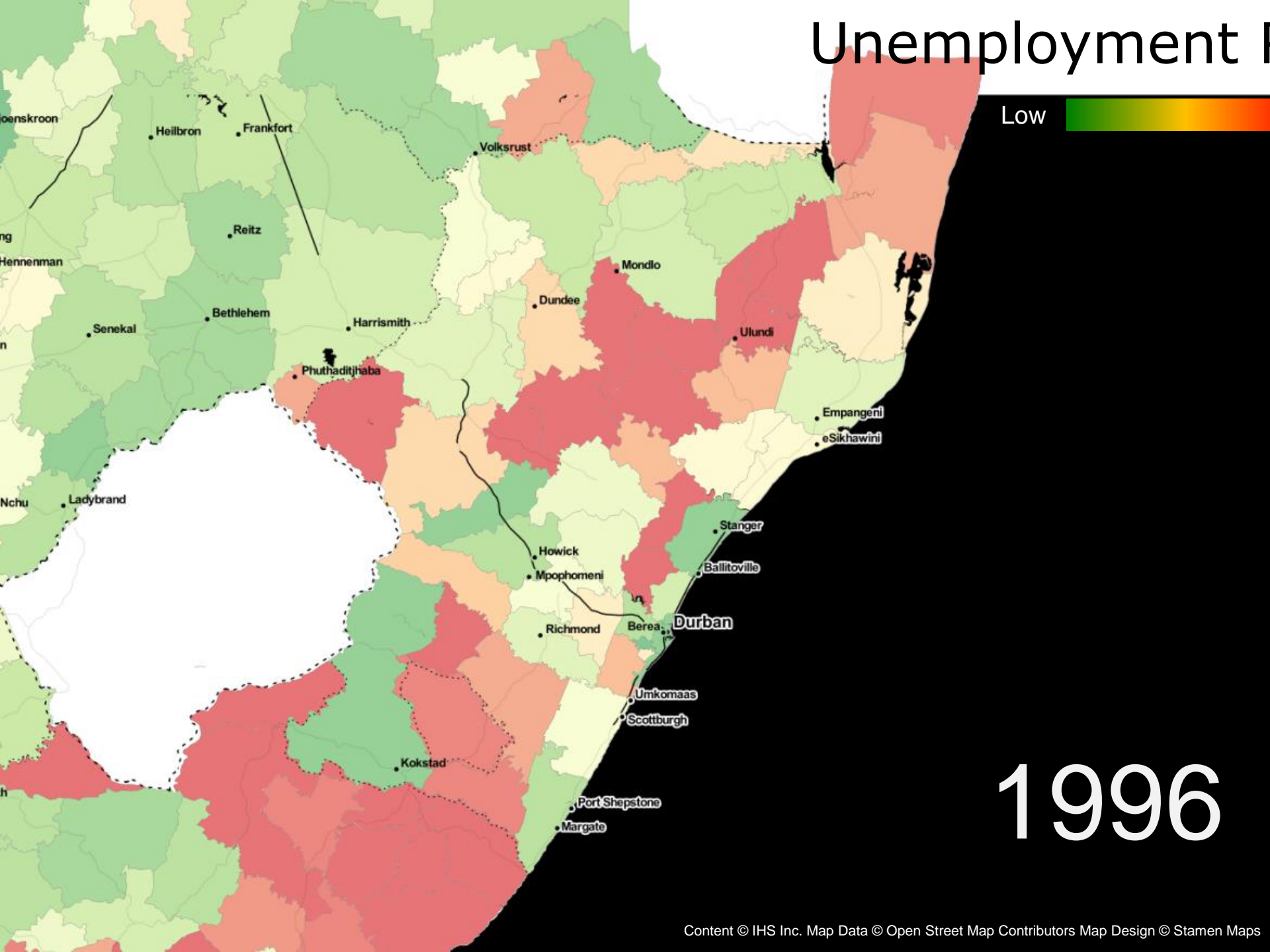


# Market Question

How did unemployment change within Kwazulu Natal between 1996 and 2011?

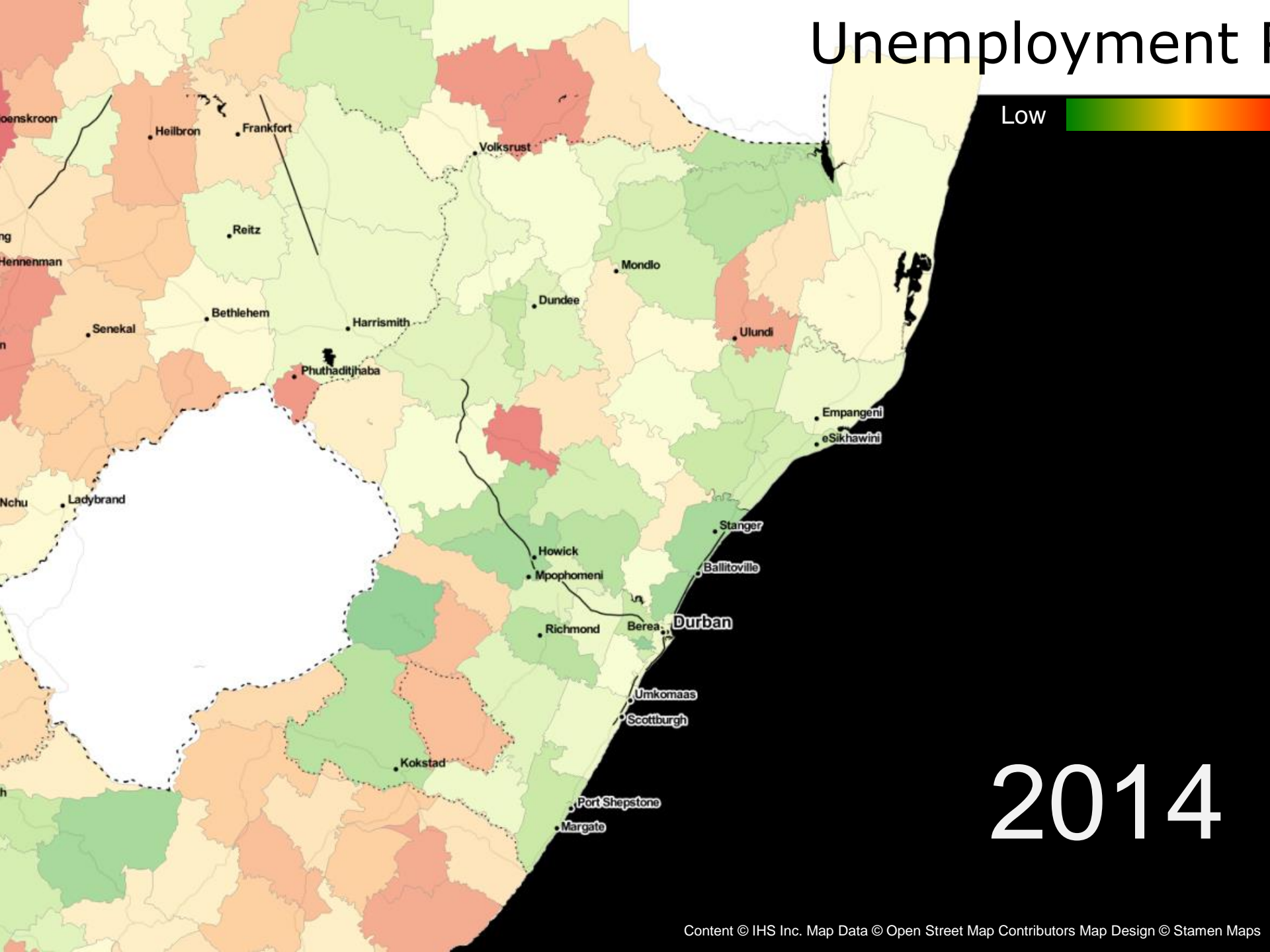
24% to 19%

# Unemployment



1996

# Unemployment



Low



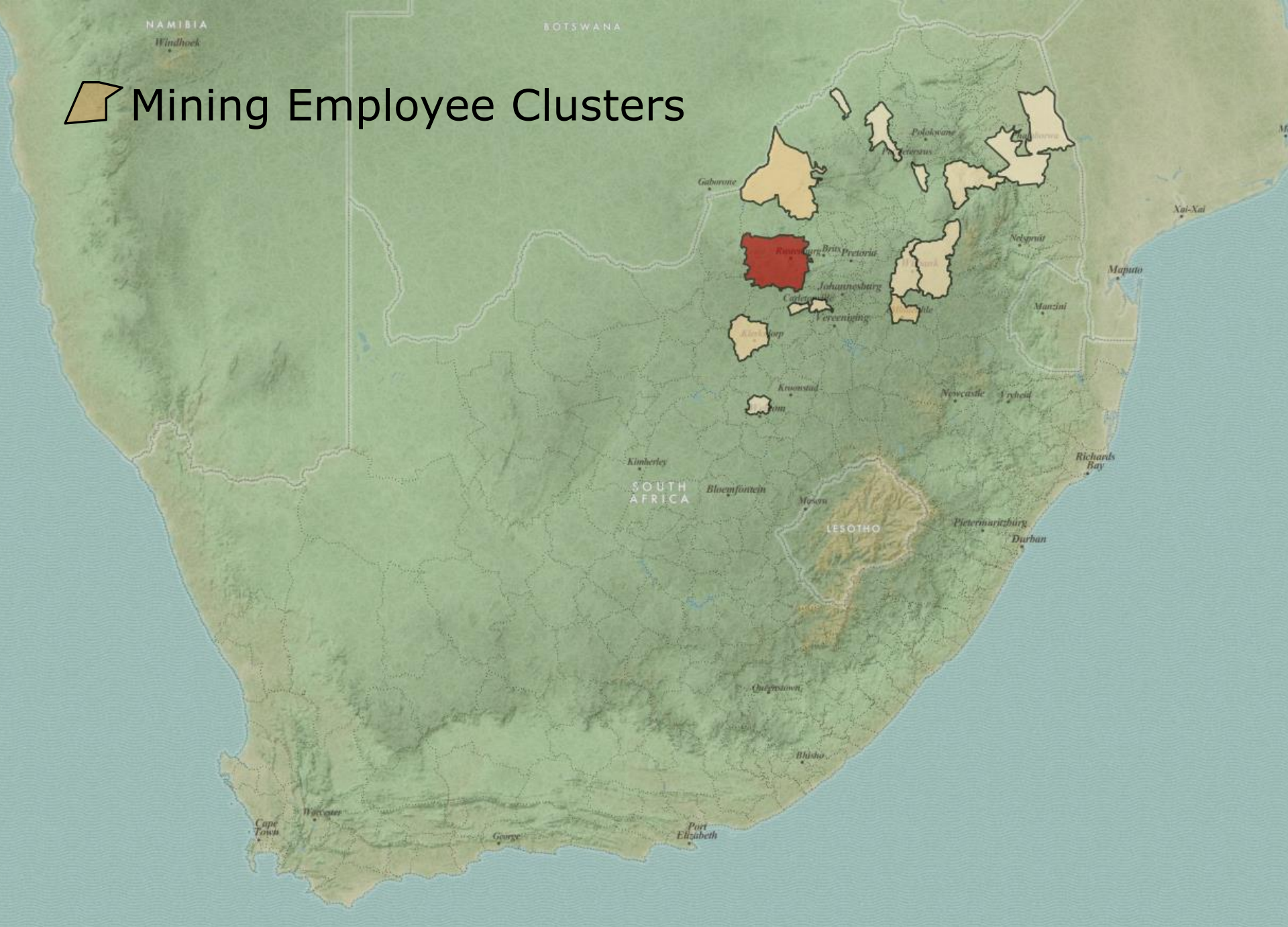
# 2014

# Market Question


How many people were employed in the mining industry in South Africa in 2012?

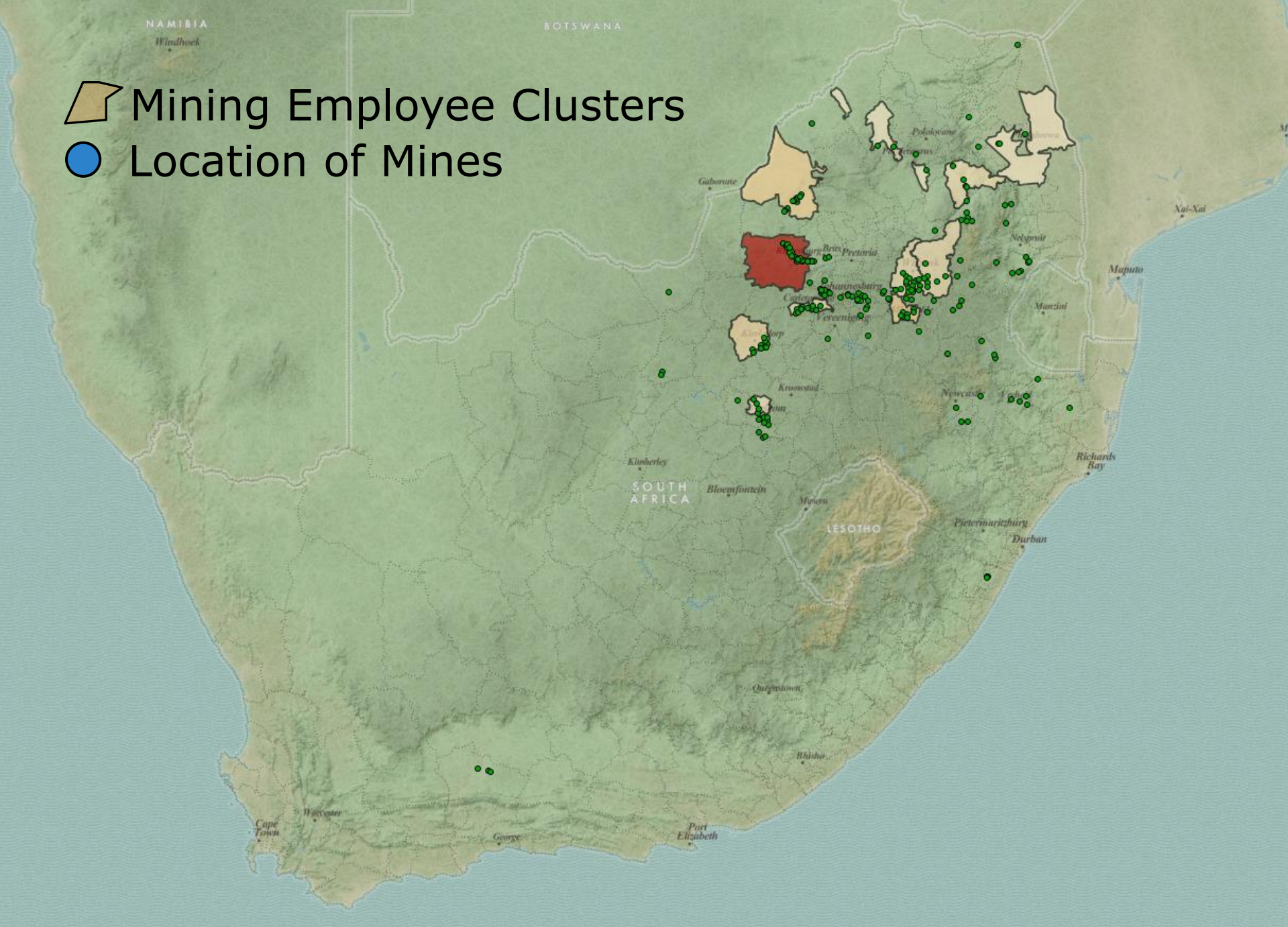
Quantity Employed in Mining in South Africa  
516k

# Mining Employee Clusters

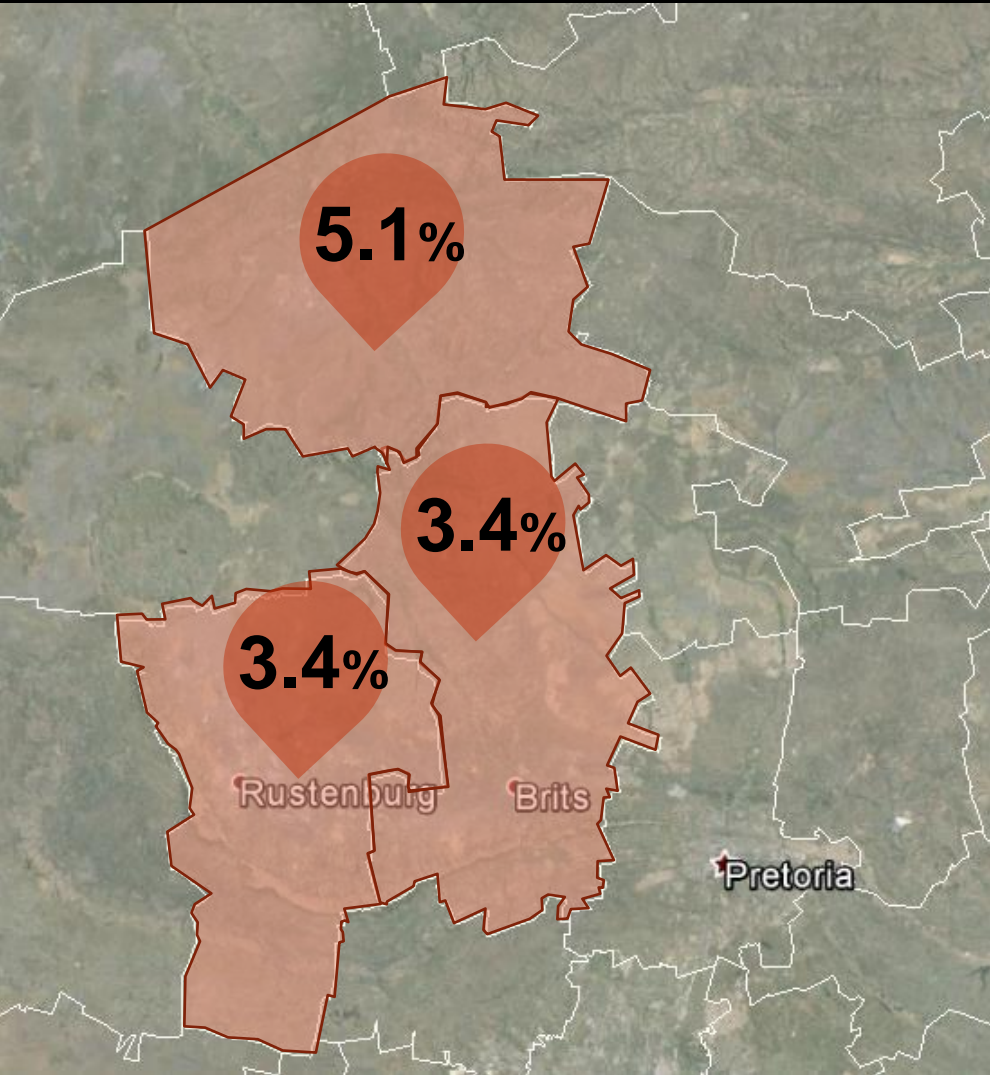




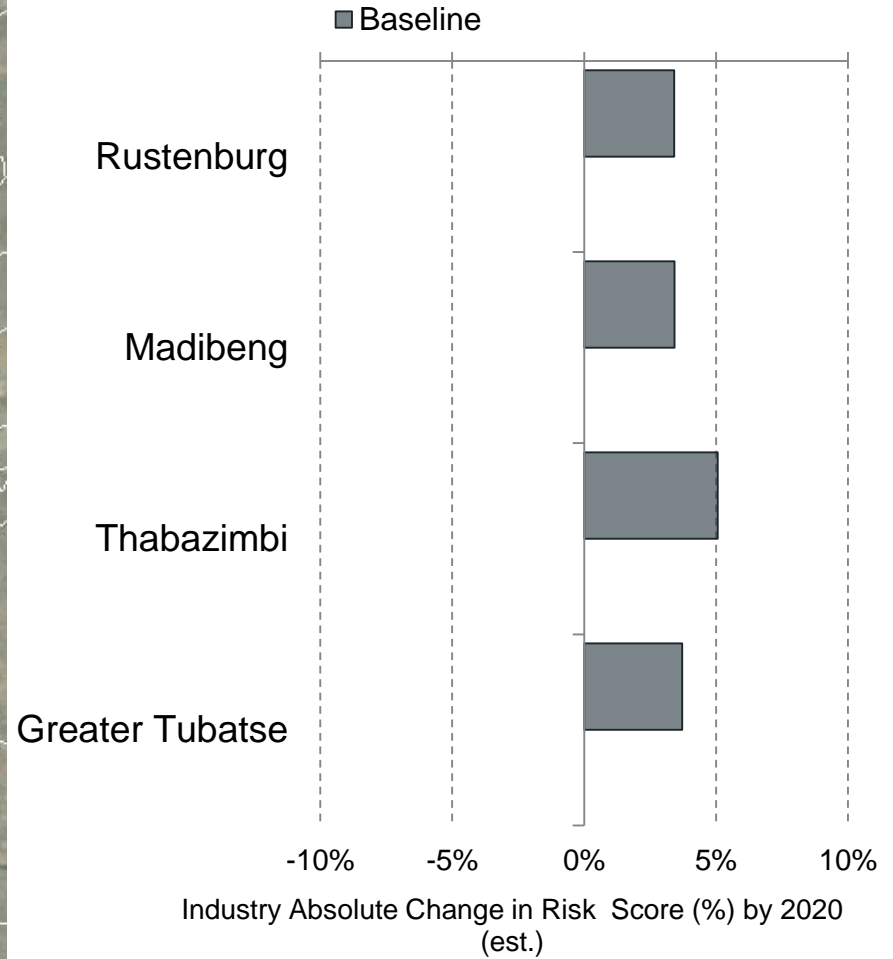
 Mining Employee Clusters  
 Location of Mines



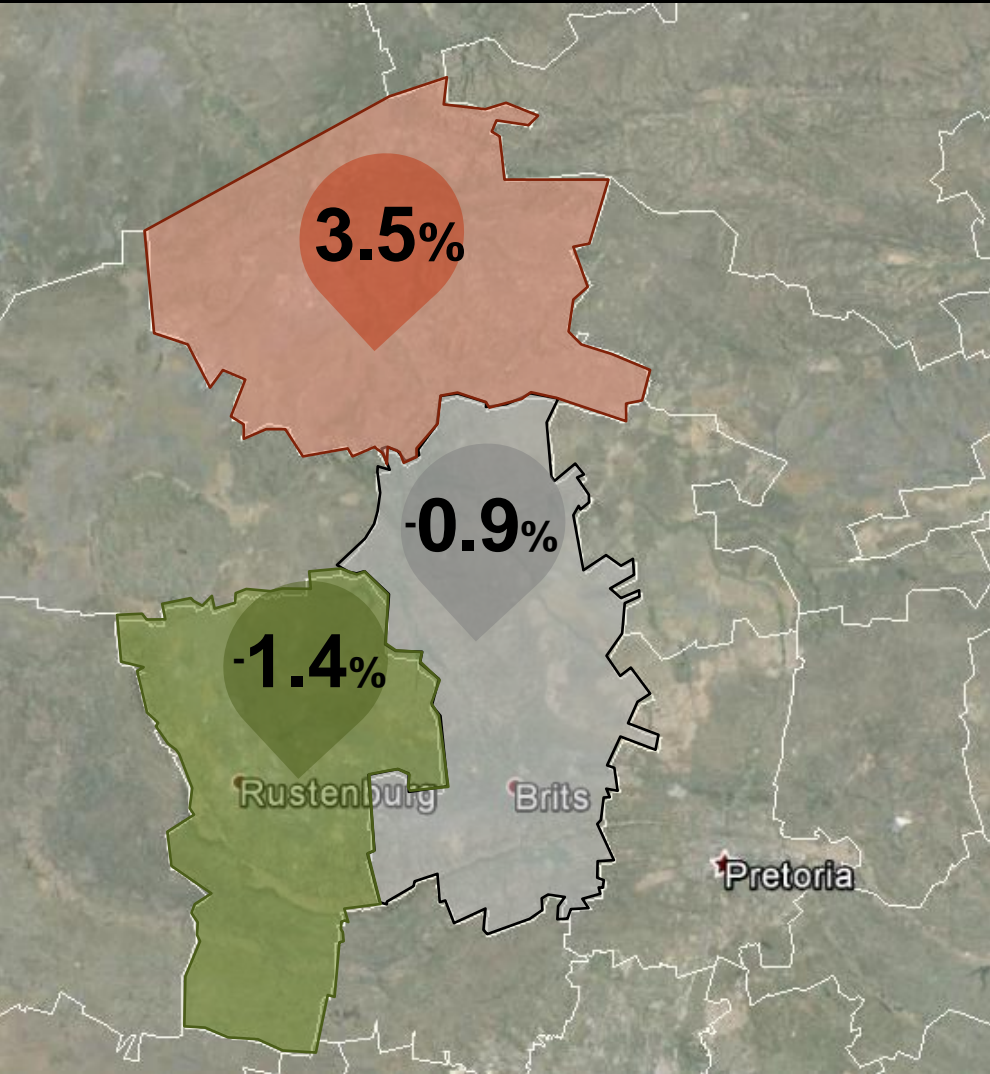
# Labour Unrest Forecast



## Platinum Mining Regions

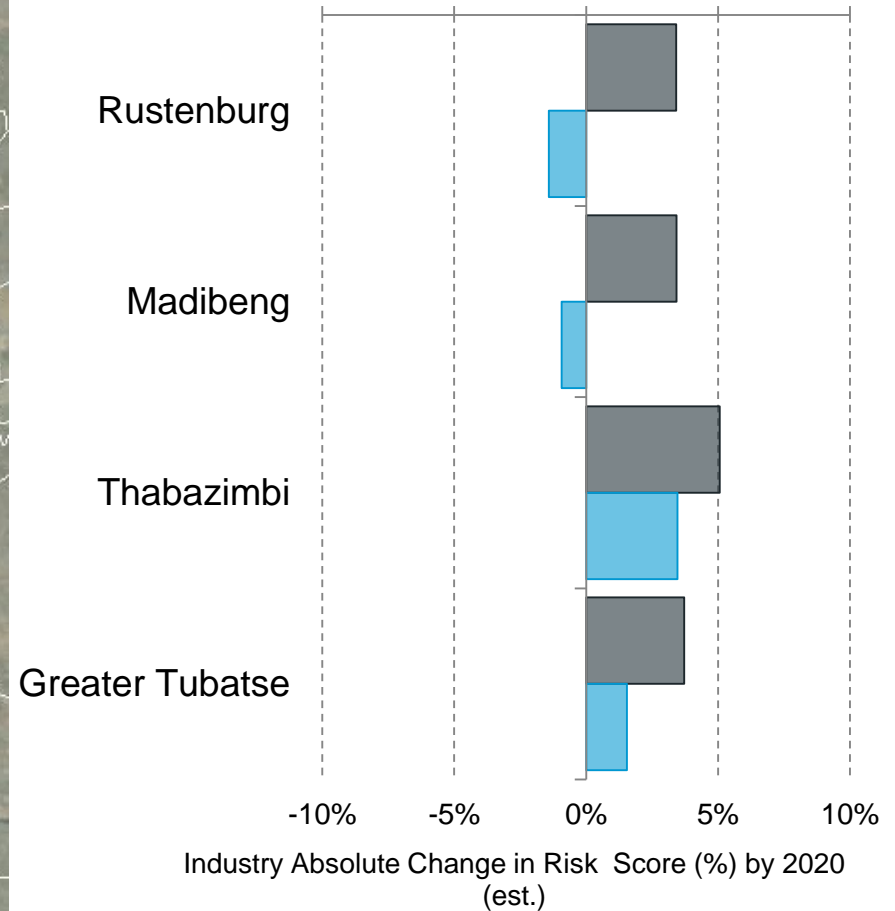


# Labour Unrest Forecast



## Platinum Mining Regions

■ Baseline ■ NDP



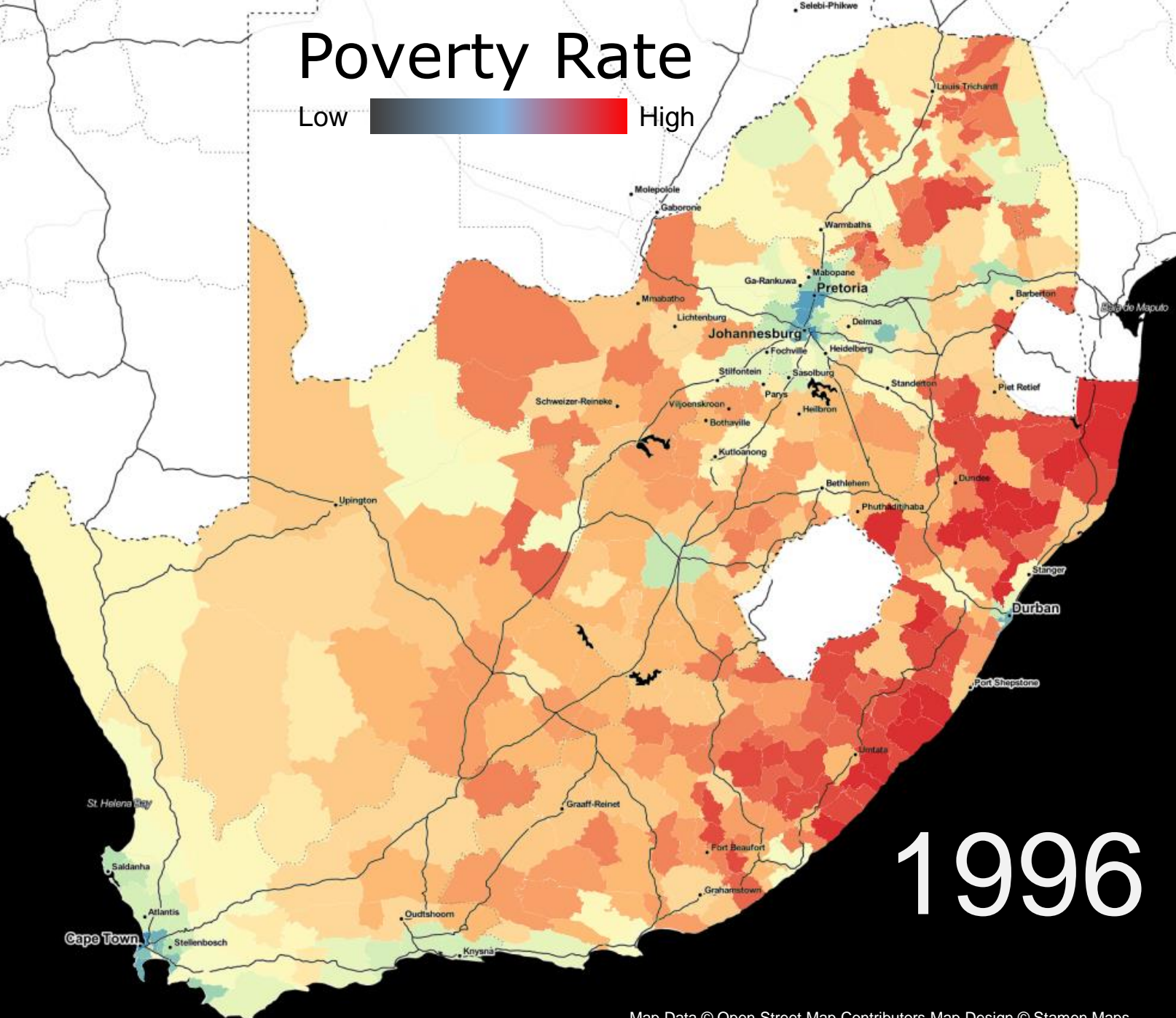
# Market Question

What percentage of households are living in poverty in South Africa?

Somewhere between  
23% and 46%

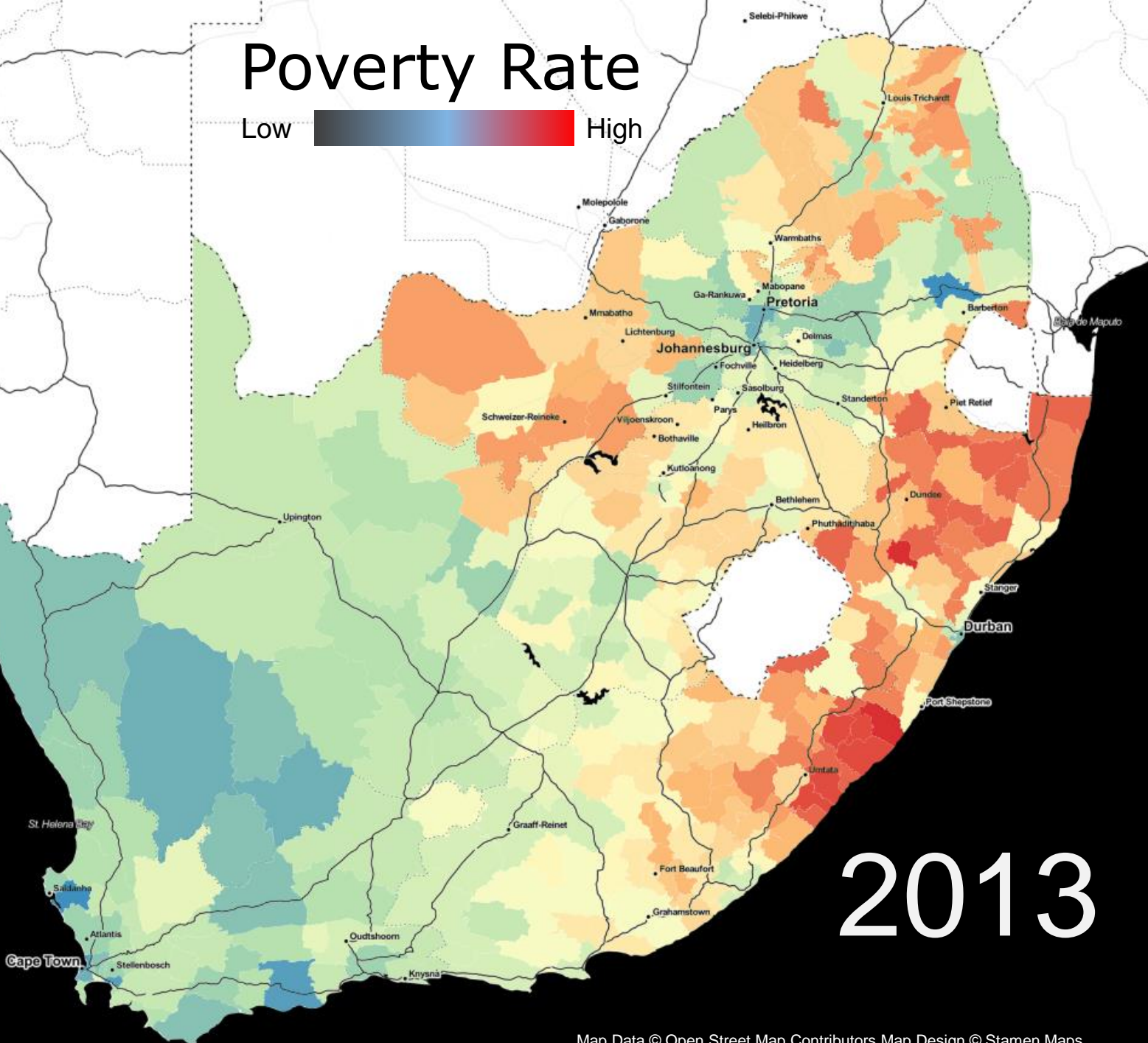
# Poverty Rate

Low  High



# Poverty Rate

Low  High



# 2013

## Market Question

Which local municipality has the highest sanitation backlog in South Africa?

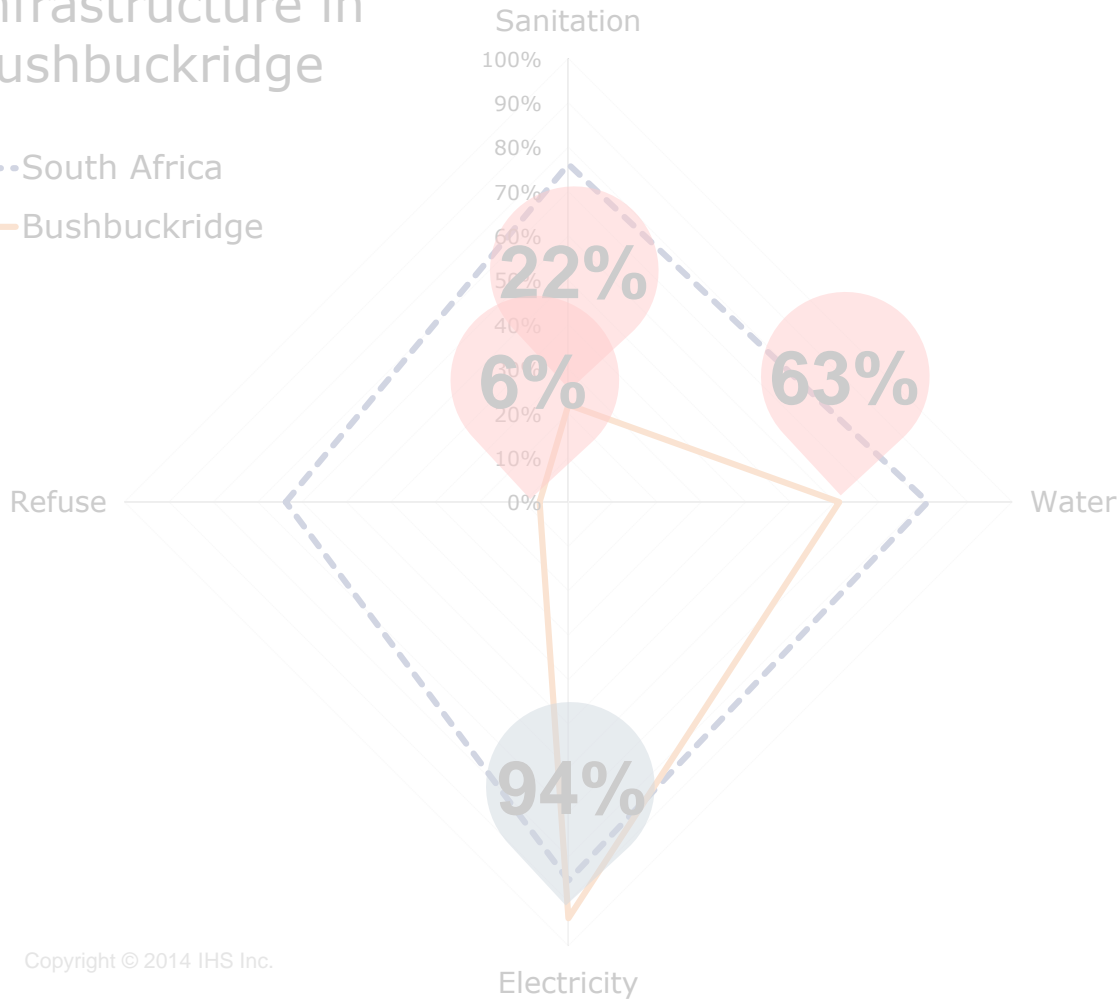
Bushbuckridge, **77.8%**

Lowest is Overstrand (Hermanus), **1.7%**

# Market Question

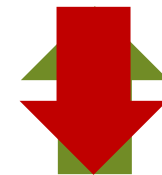
## Infrastructure in Bushbuckridge

- South Africa
- Bushbuckridge



~~88.5~~

Infrastructure Index  
Overland



51.7

Infrastructure Index  
Bushbuckridge





Flawless Data Does Not Exist

Flawless Data Does not Exist



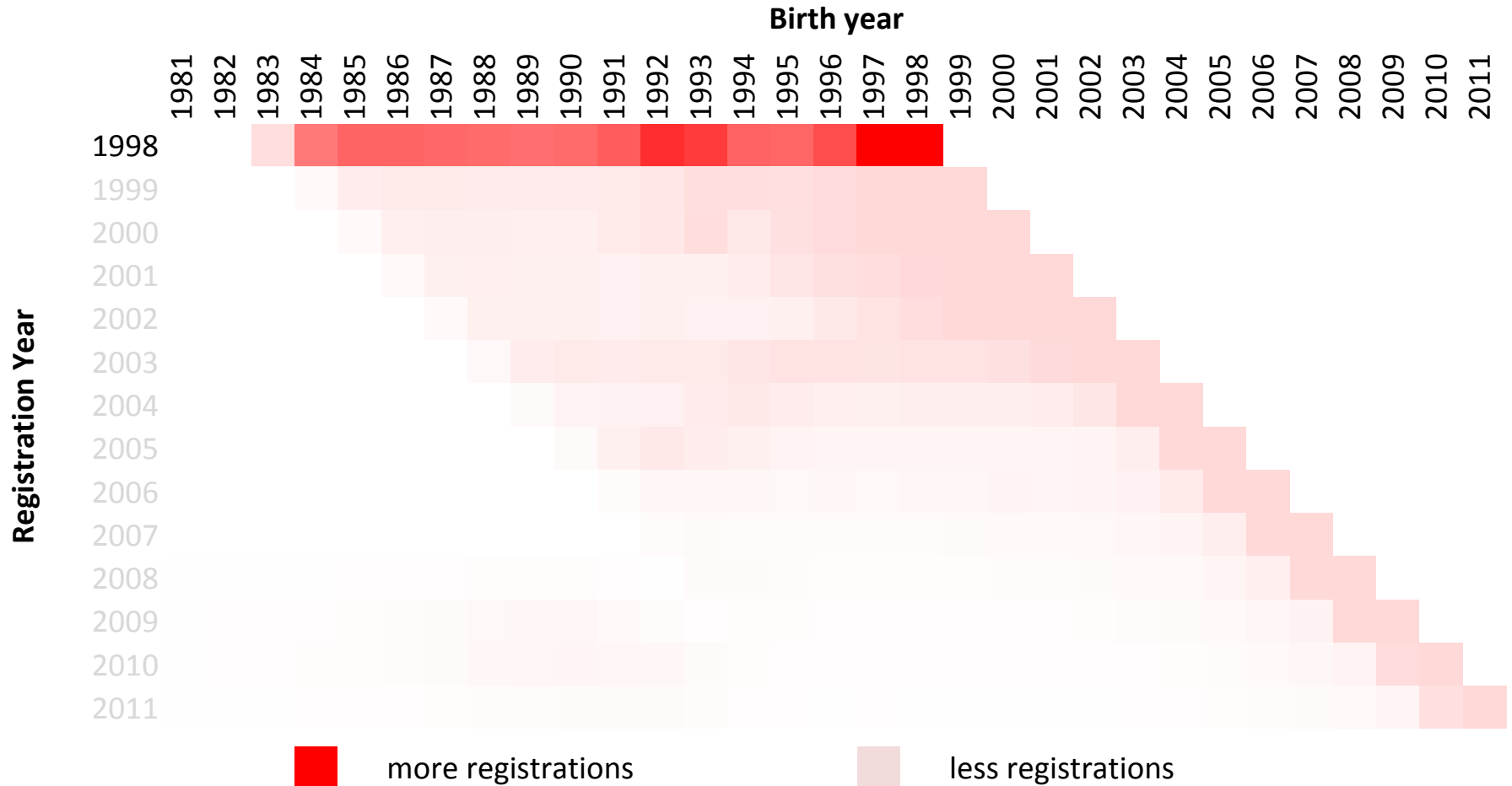
# Flawless Data Does Not Exist

	1996	2001	2011
People (m)	40.58	44.82	51.77
Undercount (%)	10.7%	17.6%	14.6%
Actual counted (m)	36.25	35.11	42.08

**49.8m – 53.7m**

True Population Range

# Flawless Data Does Not Exist





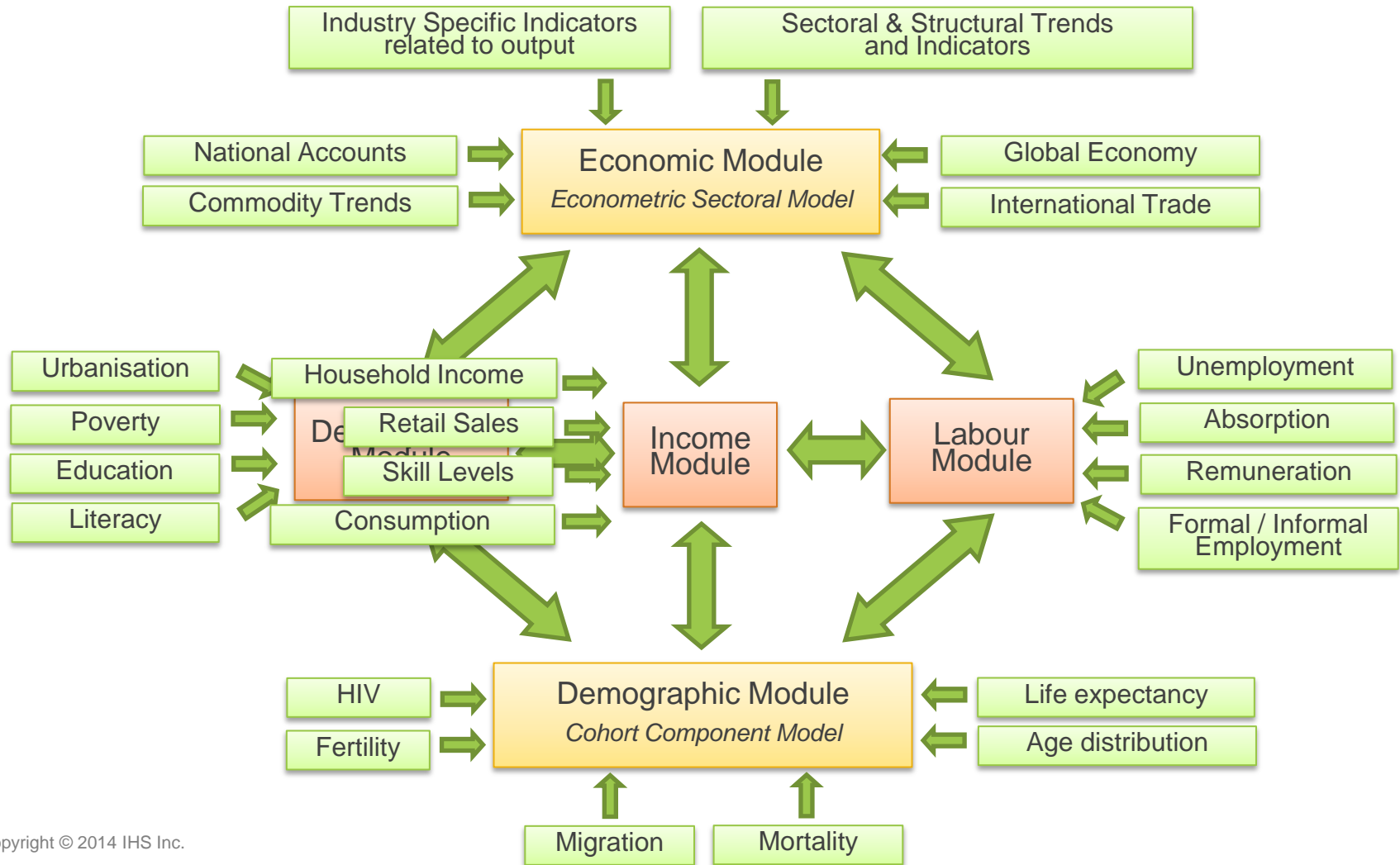
Approaching these problems  
using a single dataset does not  
work.



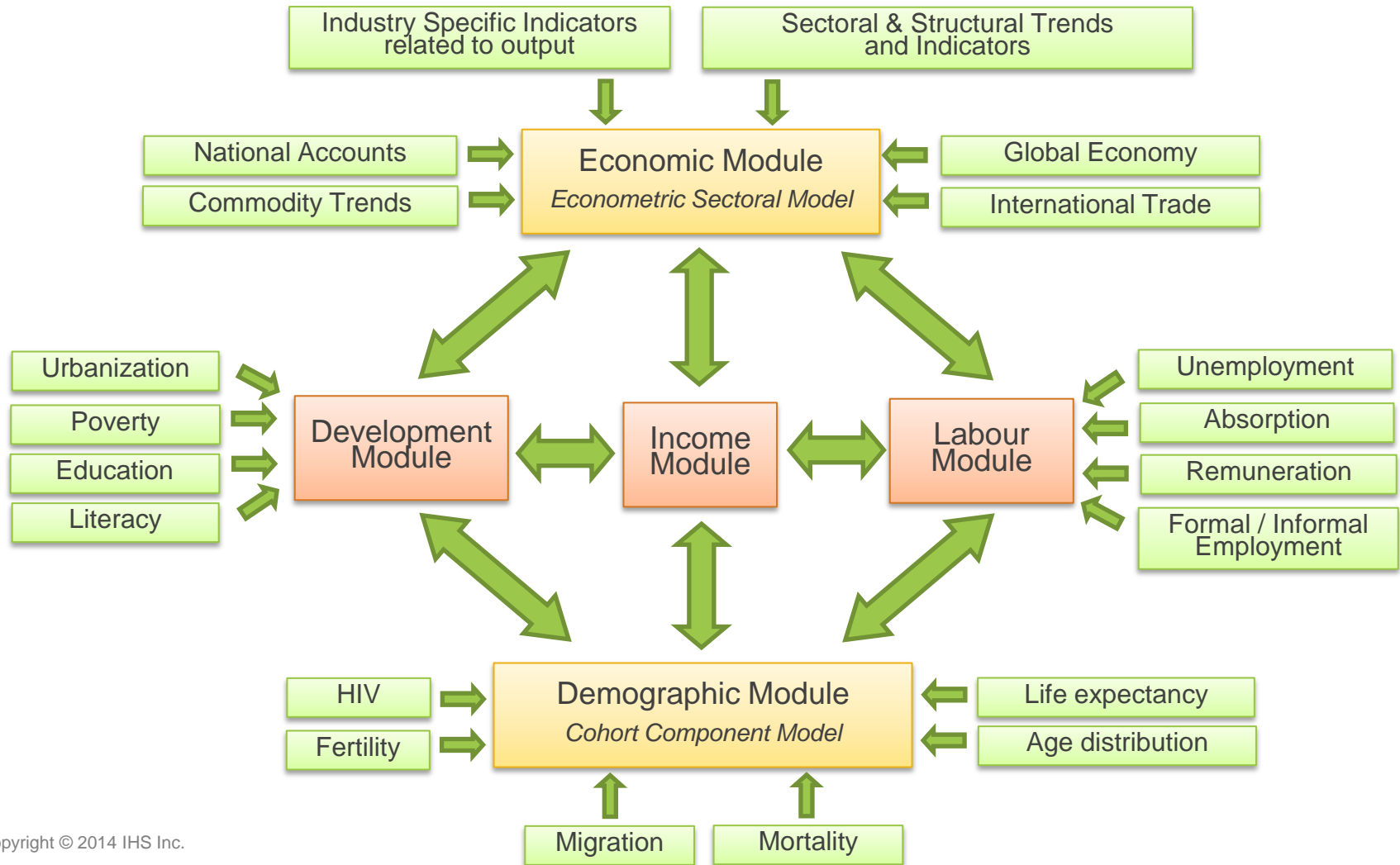
# IHS Spatial Model Method Overview

Approaching these problems  
individually does not work.

# IHS Spatial Model Method Overview

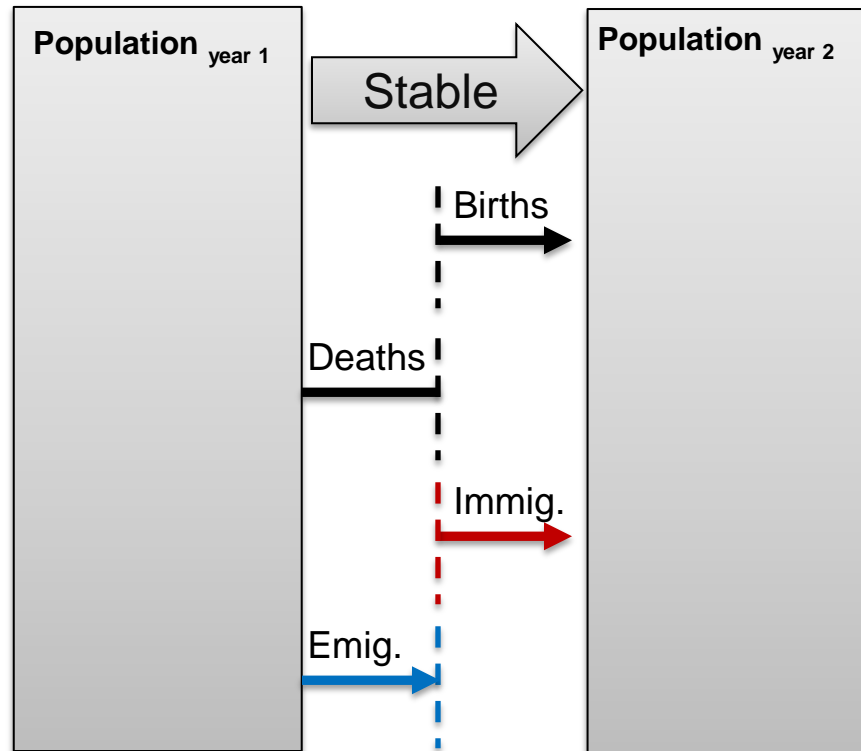


# IHS Spatial Model Method Overview



# 1. Flesh out Models Using Available Data

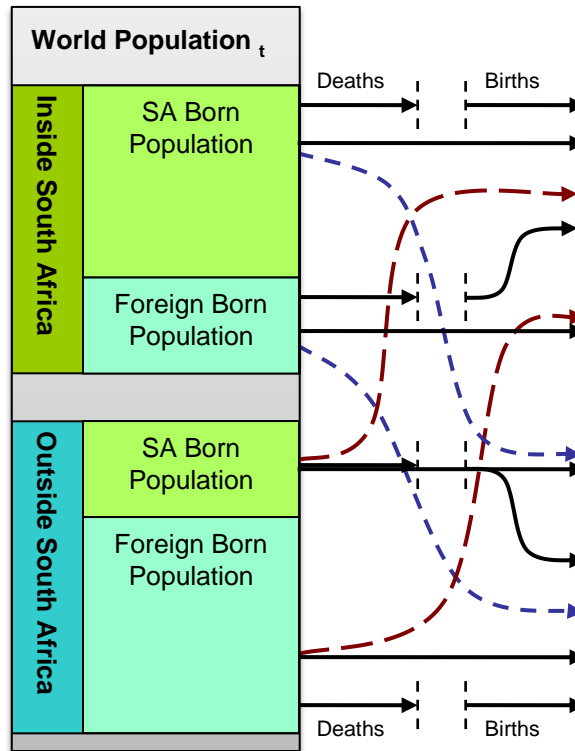
## Basic Outline





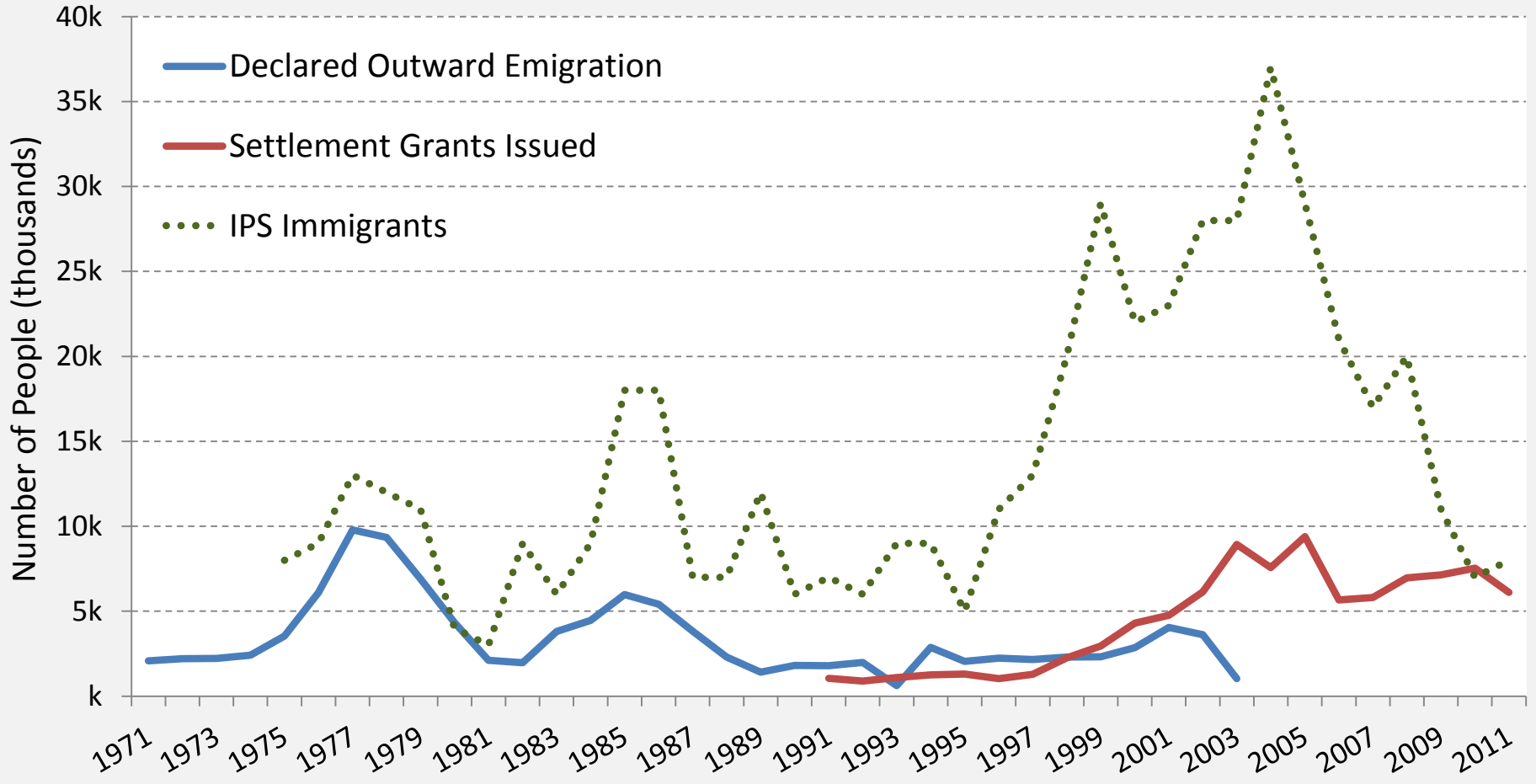
# 1. Flesh out Models Using Available Data

## Putting Flesh on the bones



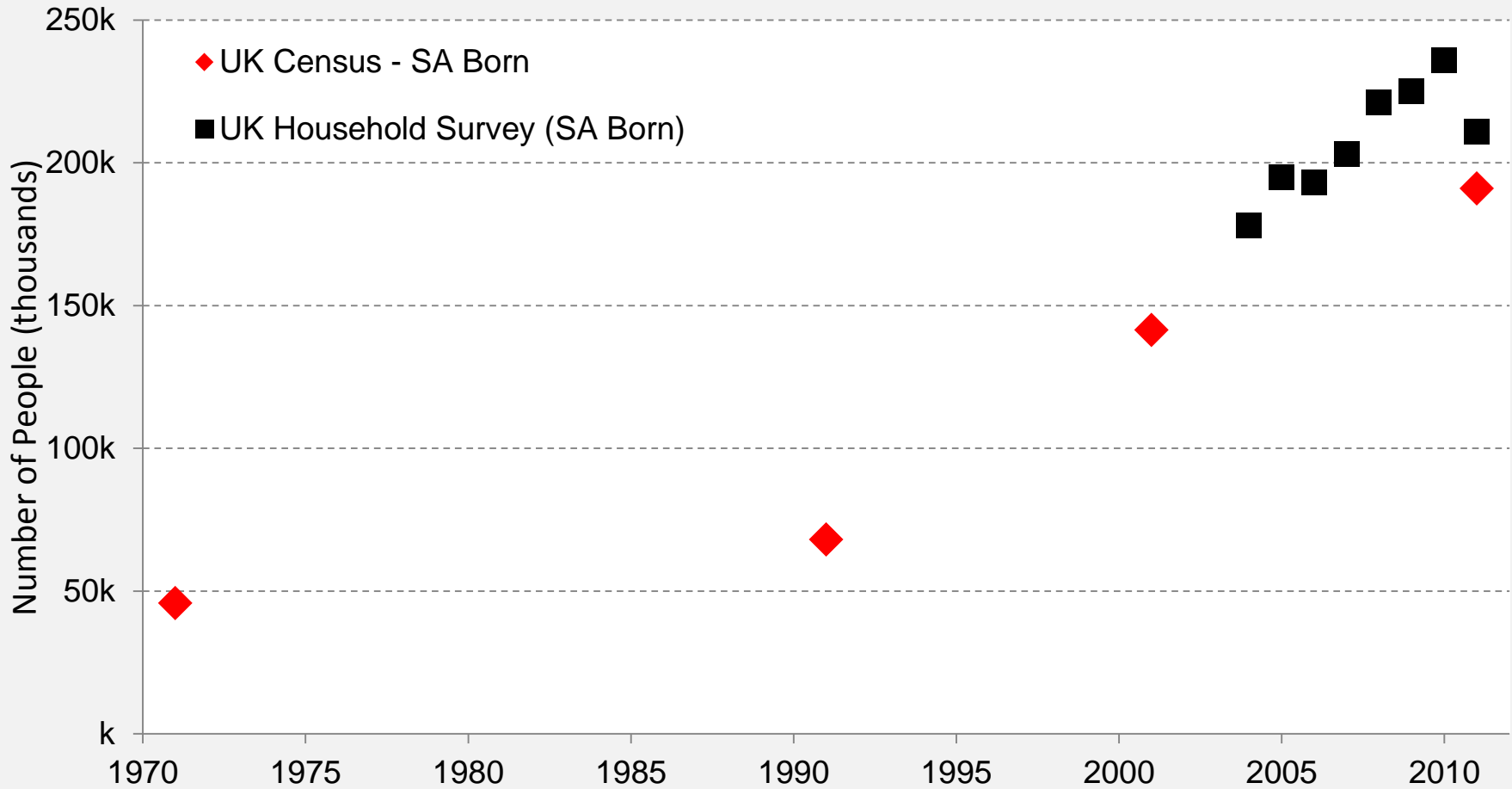
## 2. Focus on Dataset Strengths

Flows from South Africa to the United Kingdom (various sources)



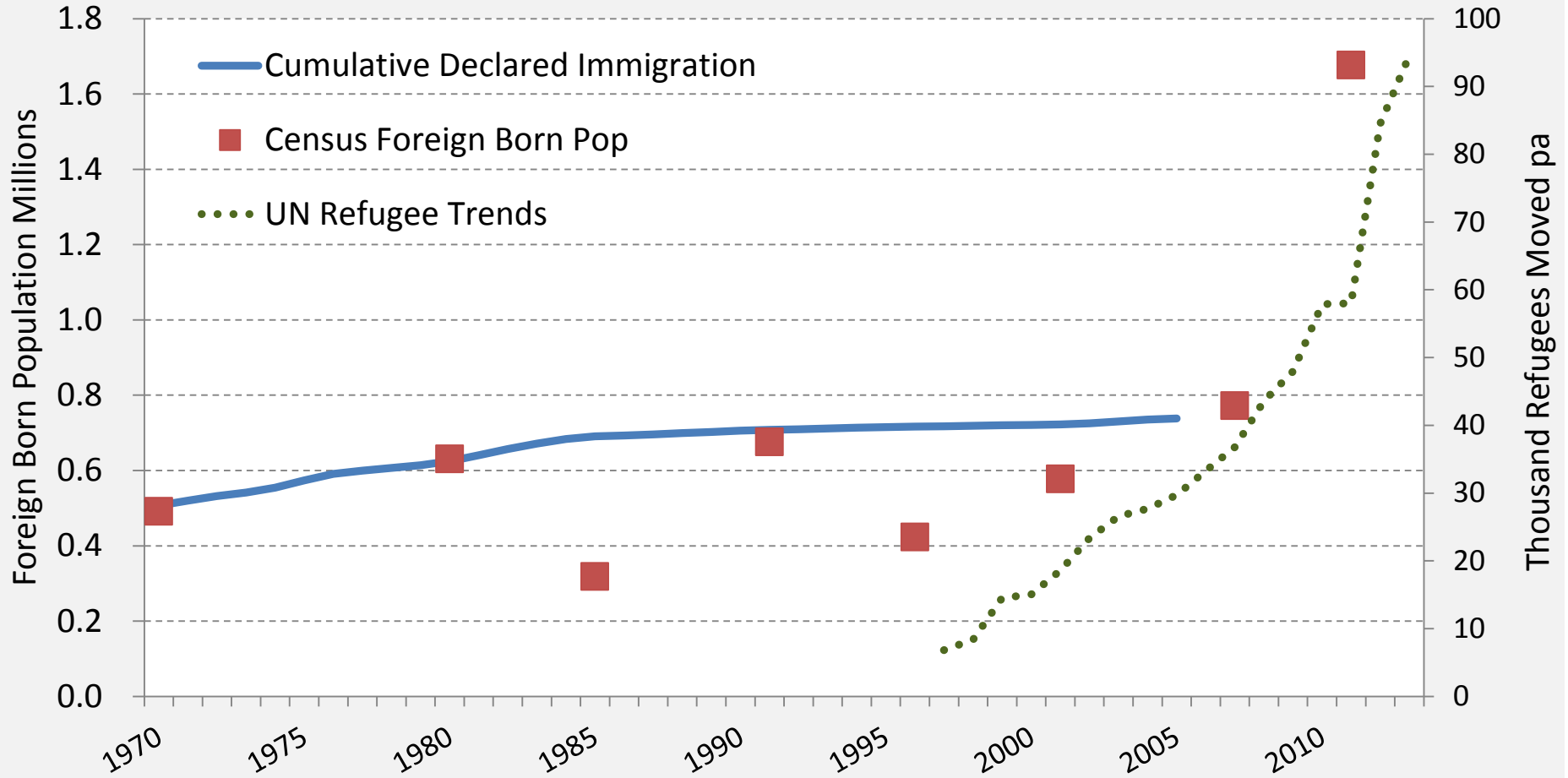
## 2. Focus on Dataset Strengths

People Born in South Africa, Living in the UK (various sources)

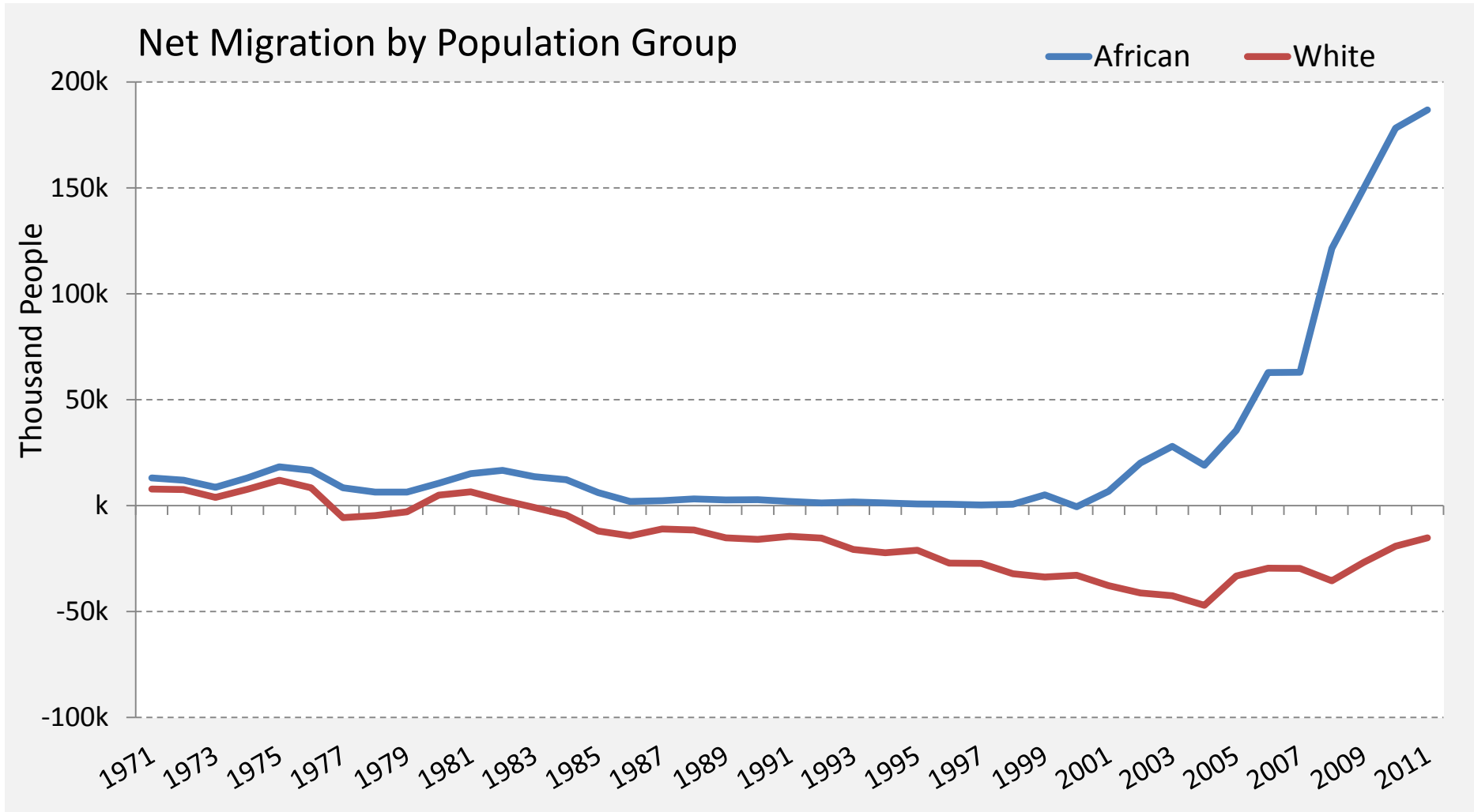


## 2. Focus on Dataset Strengths

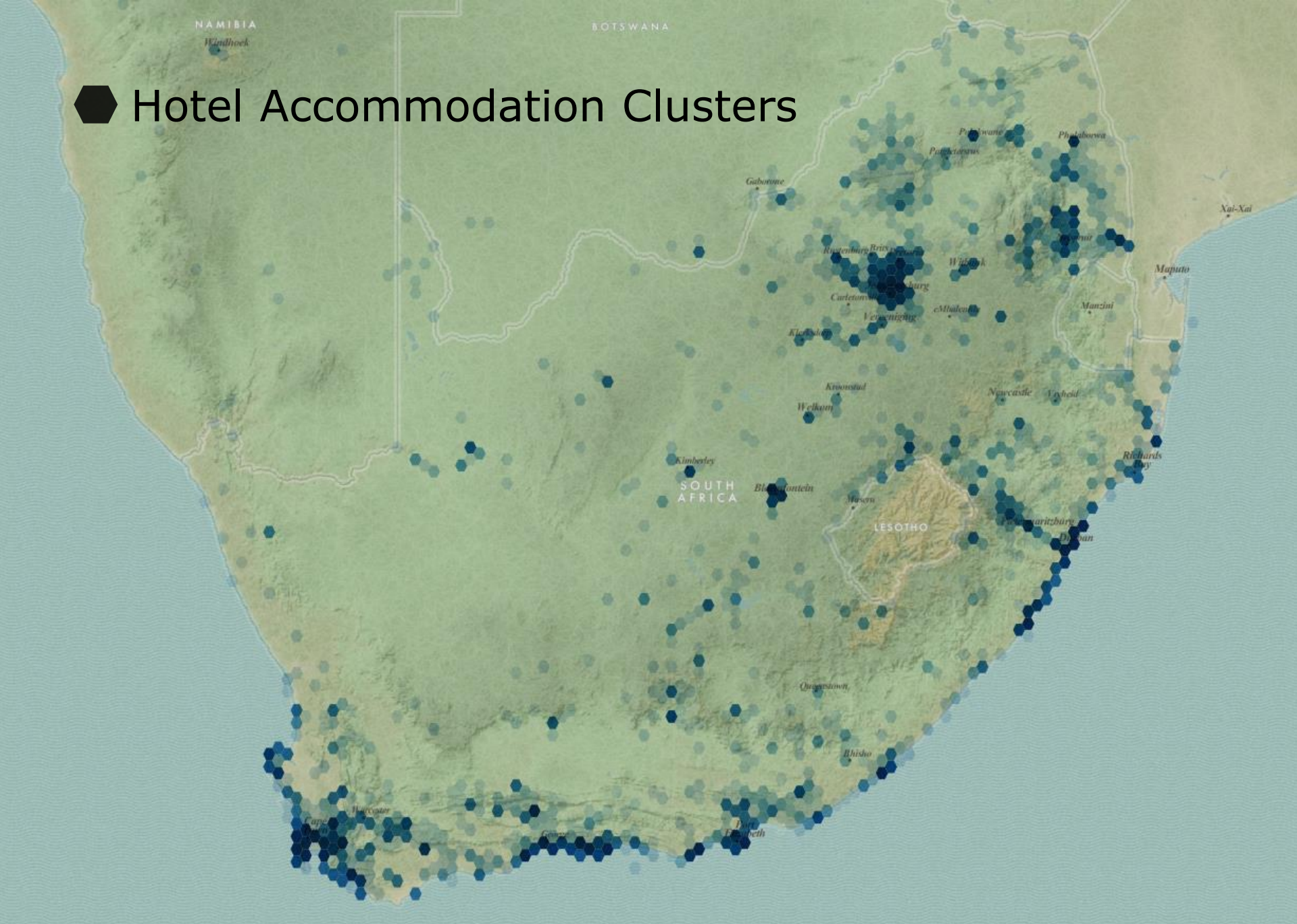
### Foreign Born African Population in South Africa



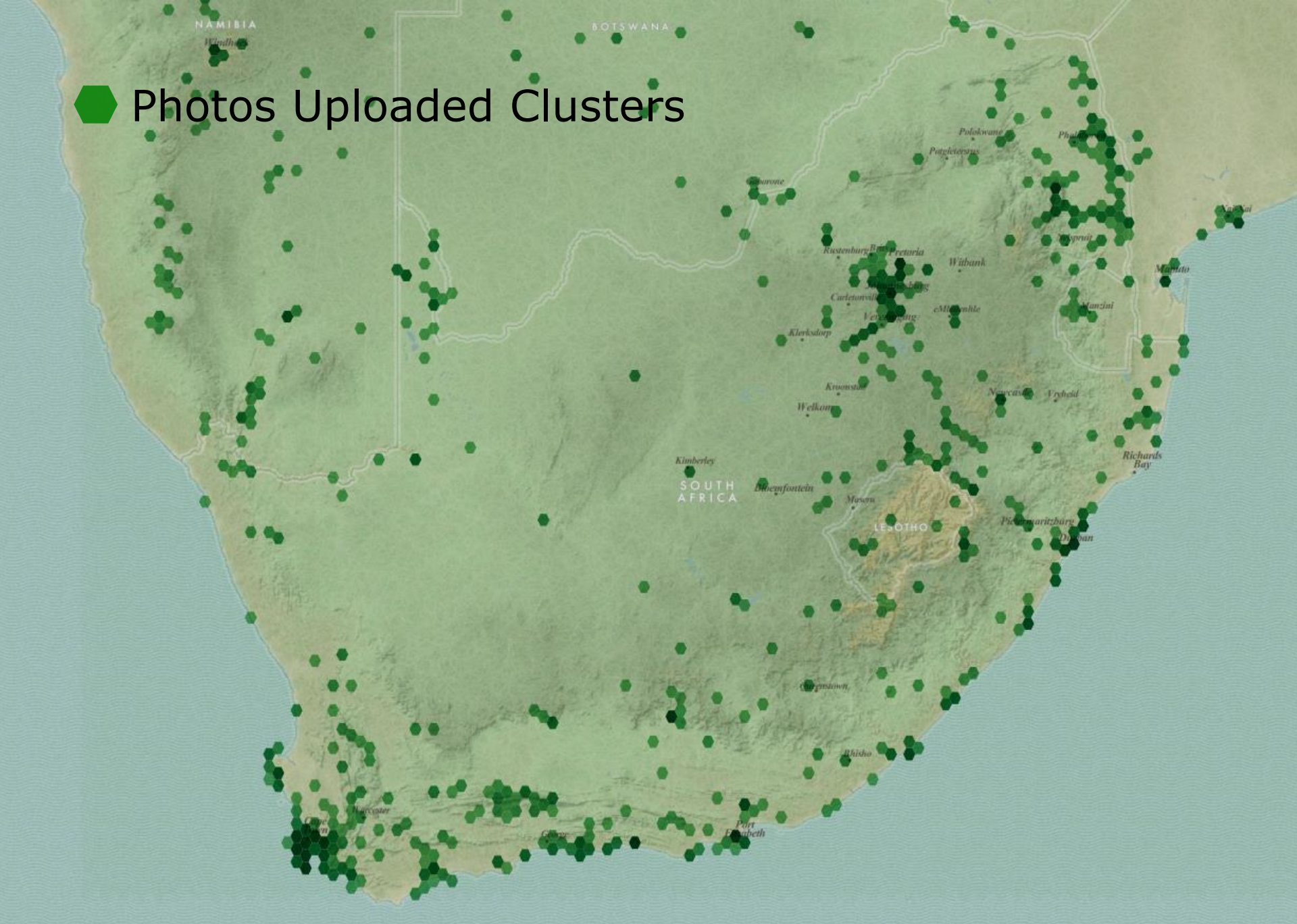
# 3. Combine Datasets Sensibly



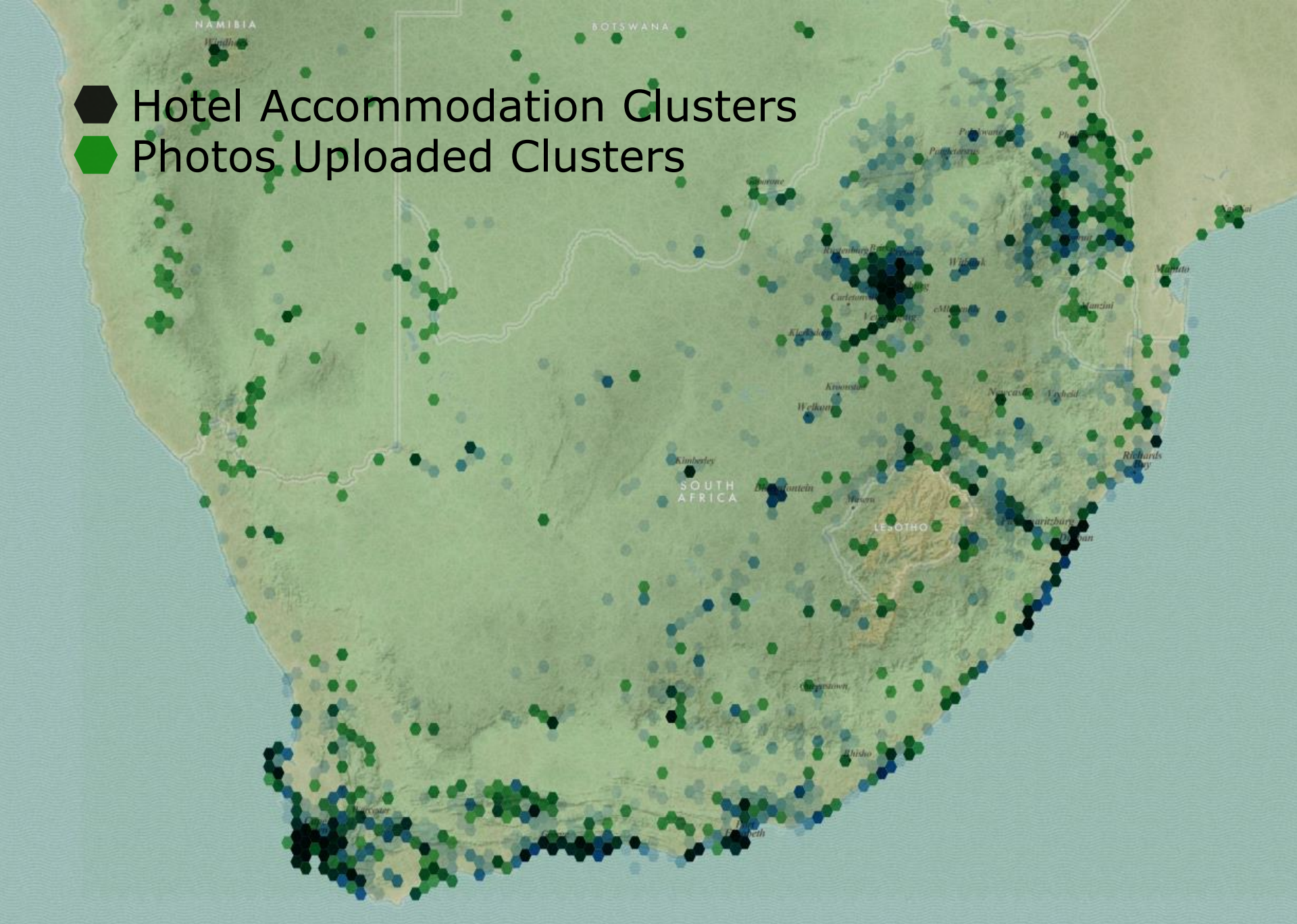
# Hotel Accommodation Clusters



# Photos Uploaded Clusters



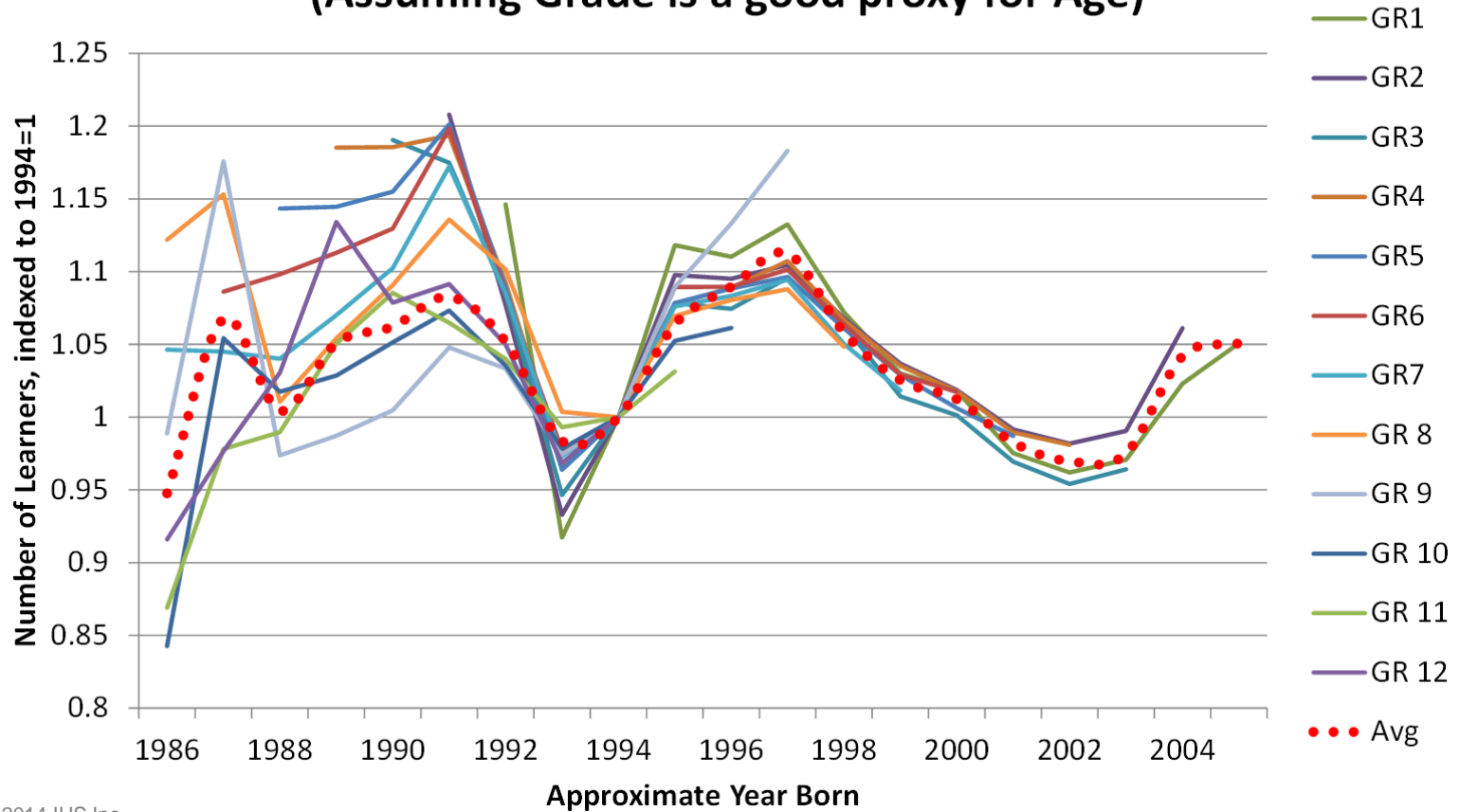
● Hotel Accommodation Clusters  
● Photos Uploaded Clusters





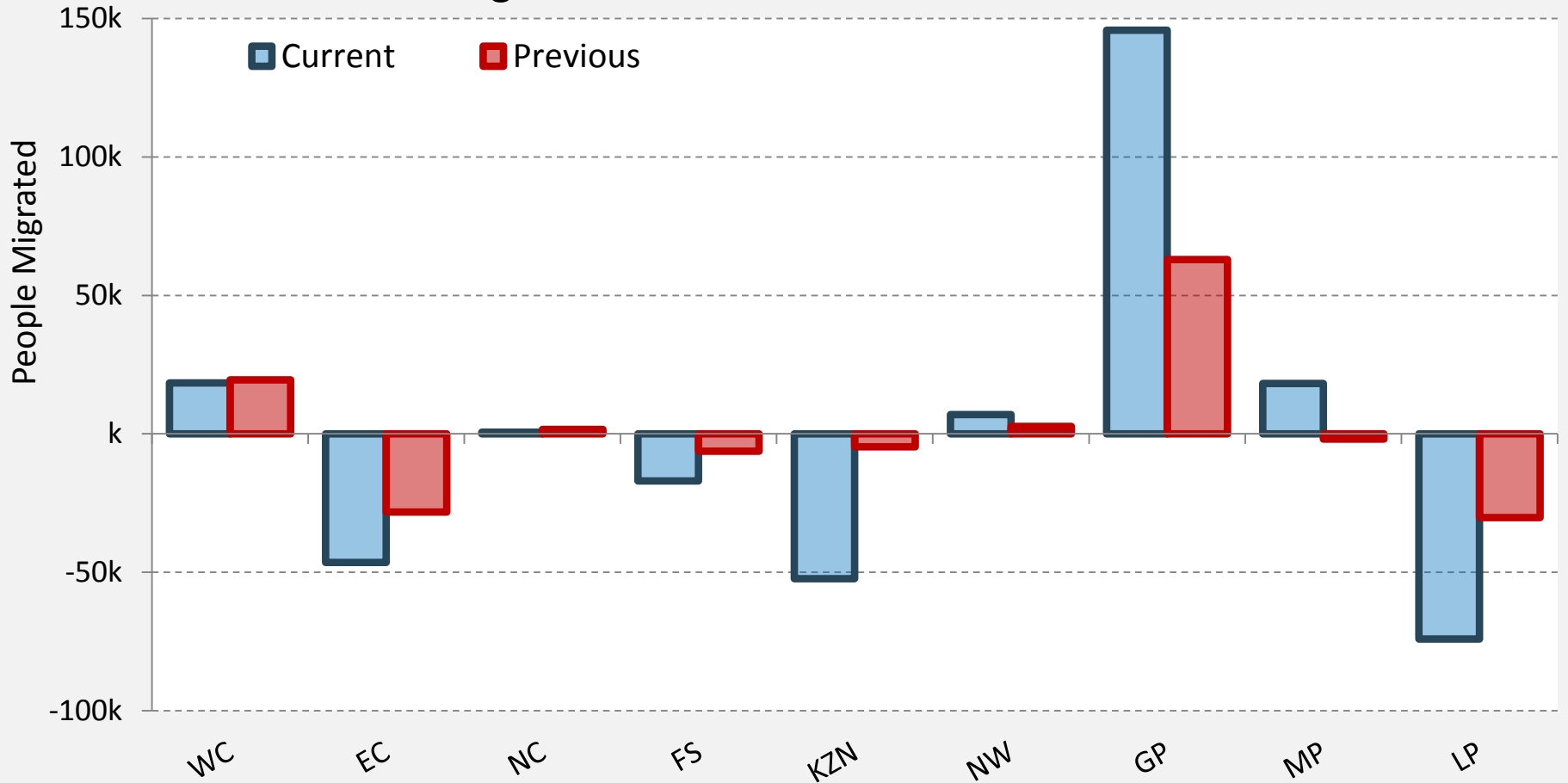
# 4. Make Assumptions Carefully

## Number of Learners per Grade (1999-2012) (Assuming Grade is a good proxy for Age)

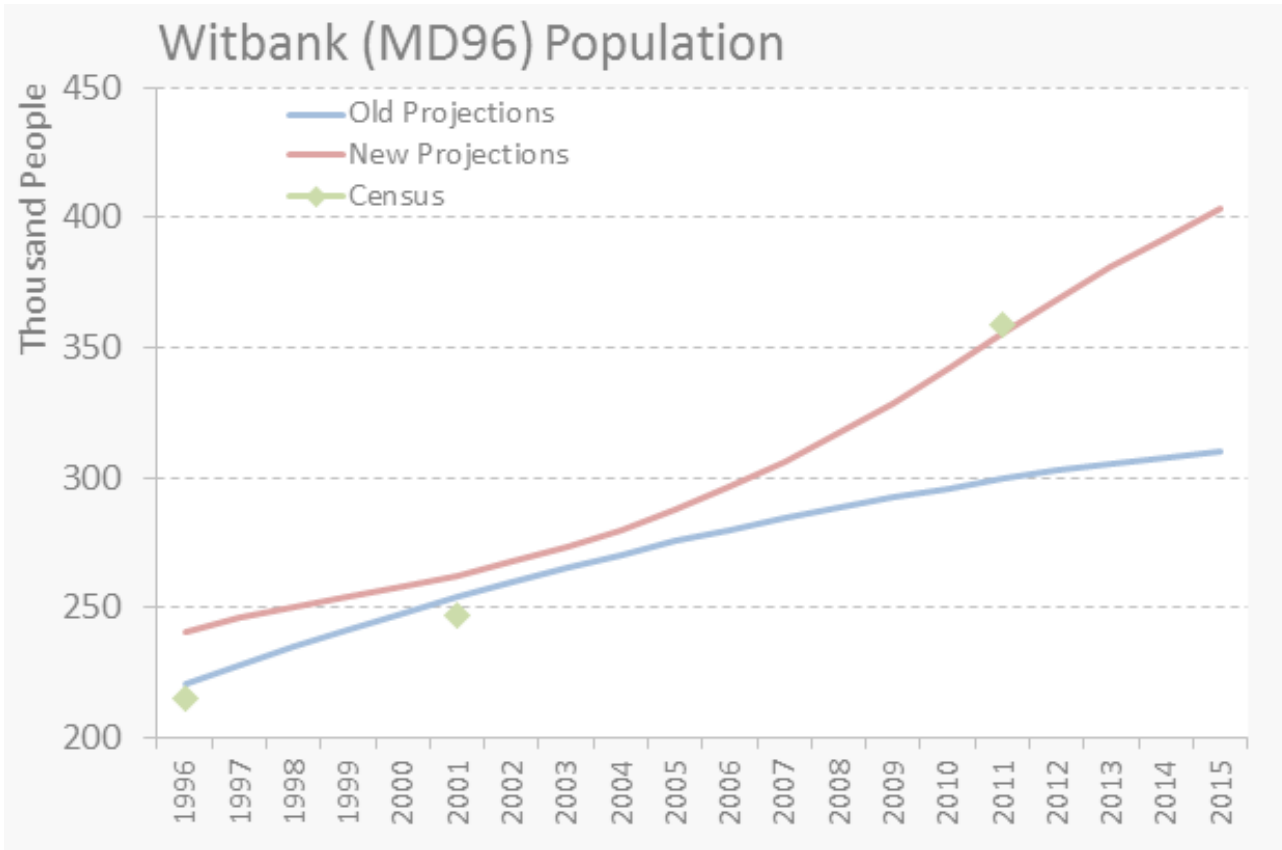


# 5. Revise if Necessary

### Net Provincial Migration



# 5. Revise if Necessary



# 300k

IHS Witbank MD96  
Population Estimate

# 350k

Census 2011  
Witbank MD96 Estimate

# 6. Sanity Checks!

2009



# 6. Sanity Checks!

2013



Bankenveld



The Future?

# Every Point on the Planet Real Time GIS Data Global Link Model



MAY 2014

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# IHS UPDATE

Plan with confidence using a comprehensive, consistent view of the factors that drive your markets.

## IHS – A leading information provider

We are more than 8,000 people, in 30+ countries, speaking 50 languages – all working each day to:

- Serve businesses and all levels of governments worldwide
  - Ranging from 80% of Global Fortune 500 to small businesses
  - Customers in 167 countries
- Provide comprehensive content, software and expert analysis and forecasts

*Helping our customers drive critical processes and make high-impact decisions with speed and confidence*





# IHS teams help advance decisions across a range of industries

## Capabilities

Energy & Power



Design & Supply Chain



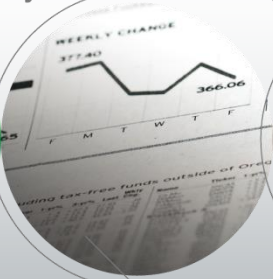
Defense, Risk & Security



EHS & Sustainability



Country & Industry Forecasting



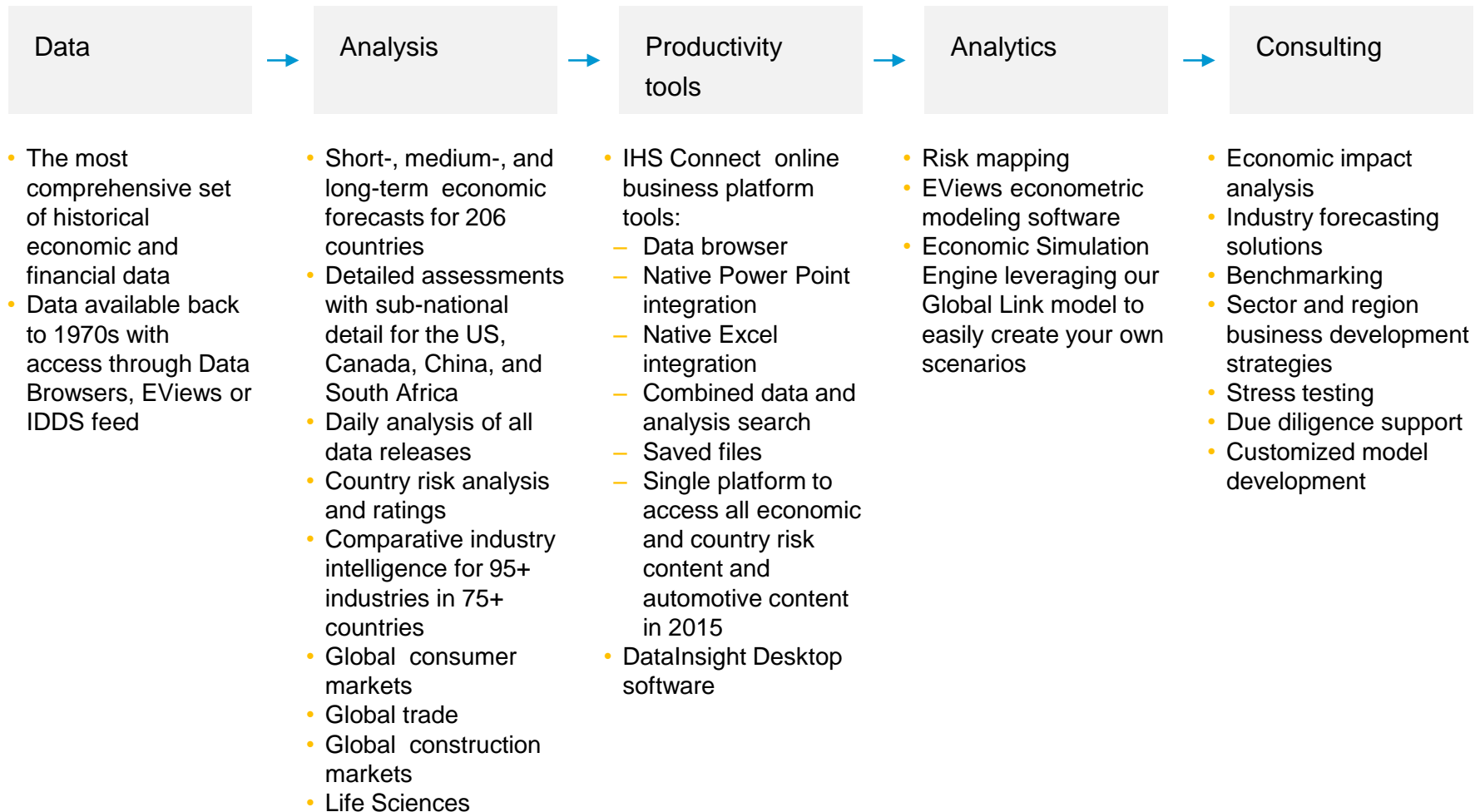
Commodities, Pricing & Cost



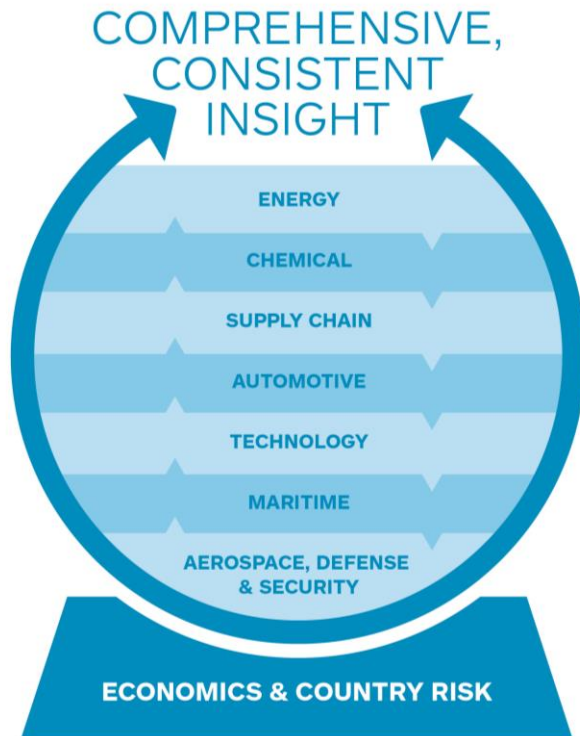
## Offerings

- Specialized Information Databases
- Software Information Systems & Intelligence Networks
- Publications & Reports
- Summits & Conferences
- Advisory Services & Research
- Consulting

# Solutions that address all facets of your workflow



# A comprehensive, consistent view of factors that drive your markets



IHS Economics & Country Risk forecasts are the foundational inputs across all IHS industry practices

The result is alignment and consistency throughout all of our macro and industry forecasts

You get a complete global perspective of the economic drivers and risks that impact your industry and ultimately your business

**You make informed decisions that are based on a consistent set of assumptions**



**A cutting-edge economic  
model that links global  
interdependent markets**

# Global Link Model: Encompasses 95% of global GDP

**68** country models...

## North America:

Canada, Mexico, US

## Latin America:

Argentina, Brazil,  
Chile, Colombia,  
Peru, Venezuela

## Europe:

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Russia, Turkey, UK

## Africa:

Algeria, Angola,  
Egypt, Morocco,  
Nigeria, South  
Africa, Tunisia

## Middle East:

Iran, Israel,  
Kuwait, Qatar,  
Saudi Arabia, UAE

## Asia-Oceania:

Australia, China, Hong Kong, India,  
Indonesia, Japan, Malaysia, New  
Zealand, Philippines, Singapore,  
South Korea, Taiwan, Thailand,  
Vietnam

# Global Link Model: Incorporates key economic drivers

...linked with each other and with global drivers of change

## CAPITAL FLOWS

*FDI allocation*  
*foreign reserve allocation*  
*new credits & debt*  
*financing*

**North America:**  
 Canada, Mexico, US

## Europe:

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Russia, Turkey, UK

## COMMODITIES

### Agricultural:

*Wheat, rice, corn, cotton, soybeans, cocoa, coffee, sugar, vegetable oils*

### Non-Agricultural:

*Aluminium, copper, nickel, tin, zinc, iron ore, gold*

## Africa:

Algeria, Angola, Egypt, Morocco, Nigeria, South Africa, Tunisia

## Middle East:

Iran, Israel, Kuwait, Qatar, Saudi Arabia, UAE

## TRADE FLOWS

*Agricultural commodities*  
*non-agricultural commodities,*  
*manufactured products,*  
*energy*

## Latin America:

Argentina, Brazil, Chile, Colombia, Peru, Venezuela

## ENERGY PRICES

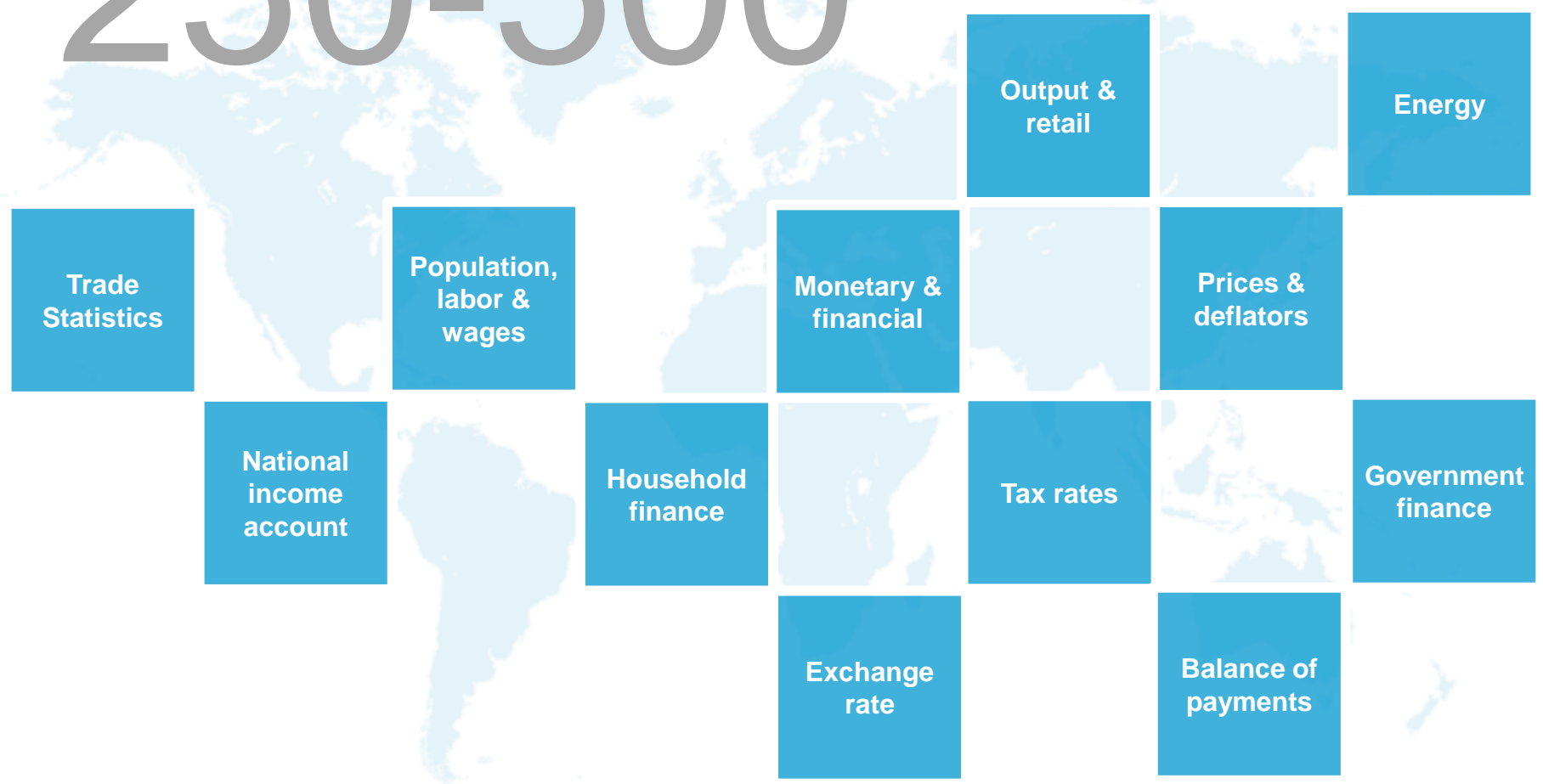
*Oil prices, gas prices, coal prices, electricity prices*

## Asia-Oceania:

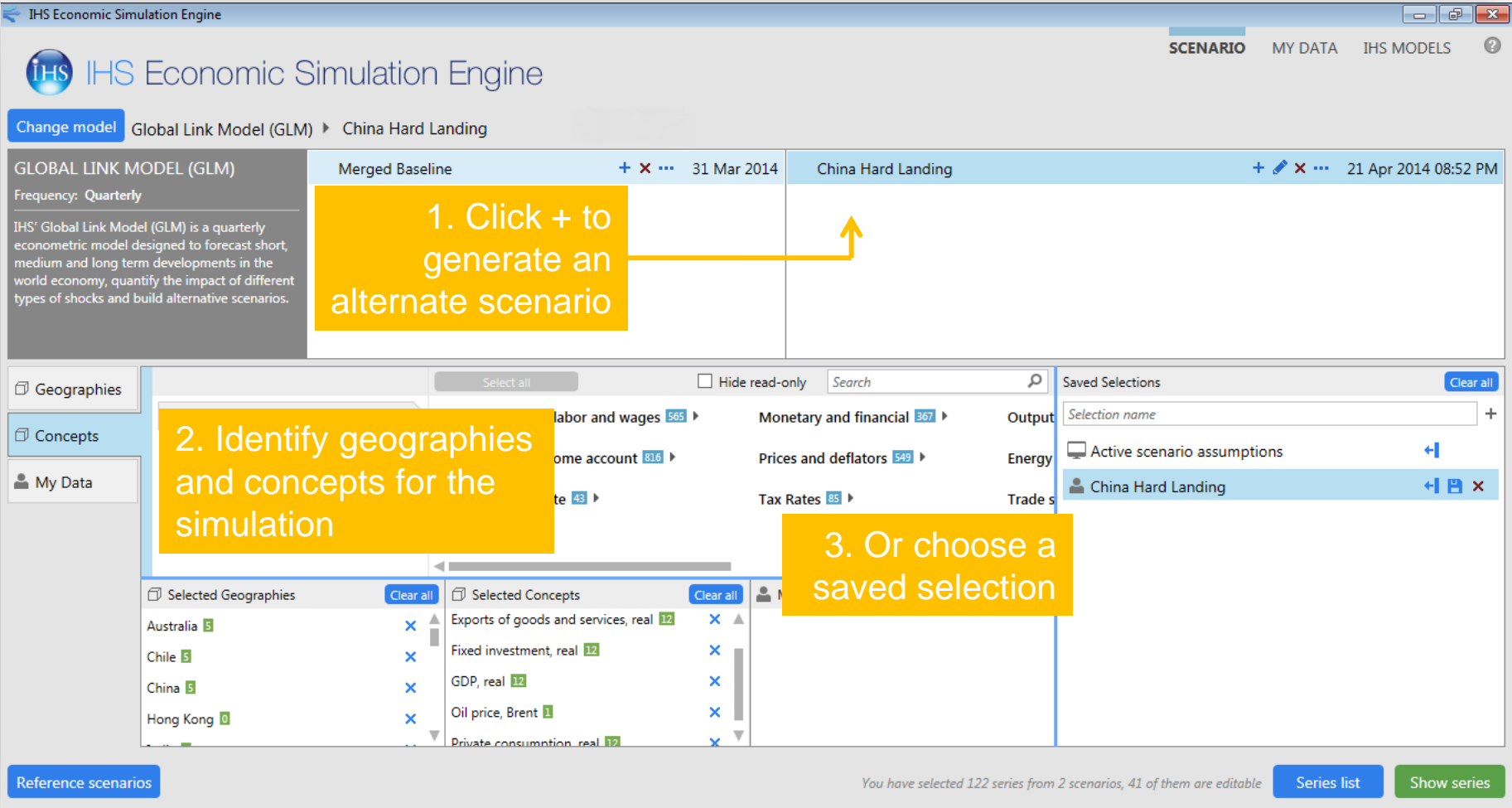
Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Philippines, Singapore, South Korea, Taiwan, Thailand, Vietnam

# Global Link Model: Leverages comprehensive data

250-500 time series per country



# Set up your scenario



The screenshot displays the IHS Economic Simulation Engine interface. At the top, the title bar reads "IHS Economic Simulation Engine". Below it, the main header shows "IHS Economic Simulation Engine" with a logo on the left and navigation tabs for "SCENARIO", "MY DATA", and "IHS MODELS" on the right. A "Change model" button is set to "Global Link Model (GLM) > China Hard Landing".

The main workspace is divided into two panels. The left panel, titled "GLOBAL LINK MODEL (GLM)", includes a "Frequency: Quarterly" dropdown and a descriptive text: "IHS' Global Link Model (GLM) is a quarterly econometric model designed to forecast short, medium and long term developments in the world economy, quantify the impact of different types of shocks and build alternative scenarios." The right panel shows two scenarios: "Merged Baseline" (dated 31 Mar 2014) and "China Hard Landing" (dated 21 Apr 2014 08:52 PM). A yellow callout box with the text "1. Click + to generate an alternate scenario" has an arrow pointing to the plus icon next to the "China Hard Landing" scenario.

Below the scenario panels is a central area for selecting geographies and concepts. On the left, a sidebar lists "Geographies" (Australia, Chile, China, Hong Kong) and "Concepts" (Labor and wages, Home account, etc.). A yellow callout box with the text "2. Identify geographies and concepts for the simulation" points to this area. In the center, there are lists for "Selected Geographies" (Australia, Chile, China, Hong Kong) and "Selected Concepts" (Exports of goods and services, Fixed investment, GDP, Oil price, Private consumption). A yellow callout box with the text "3. Or choose a saved selection" points to the "Saved Selections" panel on the right, which lists "Active scenario assumptions" and "China Hard Landing".

At the bottom of the interface, a status bar indicates "You have selected 122 series from 2 scenarios, 41 of them are editable". There are buttons for "Reference scenarios", "Series list", and "Show series".



# Change scenario assumptions

IHS Economic Simulation Engine

SCENARIO MY DATA IHS MODELS

Selection Global Link Model (GLM) China Hard Landing

Export

Geographies Concepts

Show original values Show annual values Show add-factors Transformations

Geographies	Concepts	Scenario	Charts	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4
China	Exports of goods and services, real	China Hard Landing		3.97	3.70	3.70	3.70	3.70	3.10	3.10	3.10	3.10	4.60	4.60	4.60	4.60
China	Exports of goods and services, real	Merged Baseline		3.97	4.64	5.01	5.29	5.66	5.92	6.39	6.88	7.26	7.28	7.43	7.48	7.48
	Fixed investment, real	China Hard Landing		6.69	5.10	5.10	5.10								3.30	3.30
	Fixed investment, real	Merged Baseline		6.69	6.77	6.90	7.09								7.88	7.88

2. Or edit the cells using free text or mathematical transformations

Chart

Dependencies

1. Drag and drop the interactive graphical display to generate assumptions

China, Exports of goods and services, real, PCHY

- China Hard Landing
- Merged Baseline

3. And solve the model

Reference scenarios

Solve model

# Understand the impact

IHS Economic Simulation Engine

SCENARIO MY DATA IHS MODELS ?

Selection Global Link Model (GLM) ▶ China Hard Landing Export

Concepts Geographies  Show original values  Show annual values

Concepts	Geographies	Scenario	Charts	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1	2017Q2	
GDP, real	Malaysia	China Hard Landing		3.22	4.32	4.87	5.31	5.22	5.33	5.75	6.15	5.43	5.56	5.37	5.64	5.56	5.37	5.64	5.56
GDP, real	Malaysia	Merged Baseline		3.22	4.47	4.51	5.02	4.81	5.08	5.60	6.15	5.43	5.56	5.37	5.64	5.56	5.37	5.64	5.56
	Russia	China Hard Landing		1.76	2.09	2.40	2.77	2.65	3.56	3.57	3.73	3.90	3.78	3.79	3.83	3.73	3.79	3.83	3.73
	Russia	Merged Baseline		1.76	2.09	2.39	2.80	2.68	3.61	3.59	3.74	3.88	3.79	3.73	3.77	3.73	3.79	3.83	3.73

2. And export to Excel or PowerPoint

Chart

Dependencies

1. Evaluate the impact in the graphical display

Malaysia, GDP, real, PCHY

- China Hard Landing
- Merged Baseline

Reference scenarios Solve model

# EViews & Data package

# The EconoStat Service Cont.

## Examples of South African Databanks: (215k series)

Abstract of Agricultural Statistics - Department of Agriculture, Forestry, and Fisheries

Detailed trade statistics - SARS Customs and Excise

Mineral production and sales – Department of Mineral Resources

Monthly vehicle sales - NAAMSA Flash Results

Preliminary trade statistics - SARS Customs and Excise

Price and Index Pages - Steel and Engineering Industries Federation of South Africa (SEIFSA)

Property indices - ABSA, FNB, Standard Bank, Lightstone

South African Reserve Bank general macroeconomic indicators  
- Quarterly Bulletin, Banks Supervision, NFA

Statement of the National Revenue, Expenditure and Borrowing  
- National Treasury

Statistical releases from StatsSA

Miscellaneous financial and other economic indicators

## Examples of International Databanks: (1.4m series)

Developed economies and emerging markets data

Foreign exchange data

International financial statistics and World economic outlook – IMF

OECD main economic indicators

World Bank economic and development indicators

African Primary Resources

# The EconoStat Service

EconoStat is a Web-based data navigation and analysis application that provides subscribers with the most up-to-date, easy access to historical economic and socioeconomic time-series data, database contains local and international databanks

Various output options:

- Excel
- EViews
- Other

Current Clients include:

- SA banks
- SA corporates
- SA Government

# ReX Publisher



# From data to analysis and reports

## 3 Page infographic reports



## 90 Page Statistical Overview

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# Public Sector Economist Website




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## Welcome

### Welcome to the Public Sector Economist Forum

The Forum was founded in 2009 and was born out of a realization that there were severe limitations on the organization functioning, effectiveness and overall contribution of public sector economist employed at sub-national level, further compounded by what often appears to be lack the understanding of unique dynamics at sub-national government levels by policy makers. PSEF therefore exists to enhance the role of public sector economist at provincial economic level and metropolitan municipalities in policy development, analysis and implementation through:

- Creating a platform for economic discussions;
- Sharing of information and best practices;
- Collaborative research;
- Expanding and enhancing access to training opportunities;
- Relevant and province-specific research; and
- Creating linkages between the different spheres of government.

### Vision

To support Provincial Government in its drive to accelerate Socio Economic Development and improve service delivery through sound and relevant economic research.

### Mission

To act as a voice that raises the visibility and relevance of Provincial Government Economists.

### Announcements

6th Annual PSEF Congress: Call for Papers

### User login

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Password \*

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