The Impact of the 2014 Platinum Mining Strike in South Africa: An Economy-Wide Analysis

Heinrich Bohlmann and Jan van Heerden (UP) with Peter Dixon and Maureen Rimmer (CoPS)

Published in Economic Modelling 51 (2015) 403-411

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

PSEF 2016

Introduction

- South Africa is the world's largest producer of PGMs, rivals gold as the country's top export revenue generator

- Labour strike at the major platinum mines started on 23 Jan 2014 and ended on 24 June 2014

- Dispute between AMCU (labour union) and Amplats, Implats and Lonmin

- According to a joint statement, employers lost R23bn in revenue and employees lost R10.7bn in earnings during the strike

- We use dynamic UPGEM to estimate the economy-wide impact of the strike over the period 2014-2020

- Main challenge (and contribution) of this paper was to design a realistic labour strike simulation within our CGE framework

Simulation Design: Basics

- Standard CoPS-style dynamic CGE methodology

- We run four 'policy' scenarios, each building on the previous, allowing us to carefully analyse the impact of the different components of the shock on the economy

- The first scenario (S1) contains the basic elements of the shock that occurred as a result of the strike and is common to all four scenarios

- The remaining scenarios (S2 to S4) builds on S1 by adding additional elements of the strike (wages, investment, ERoR in the industry)

- Platinum contributes around 20% of output in the metal ore mining industry group with the strike assumed to render K & L unproductive for six months – shocks are weighted accordingly (10%)
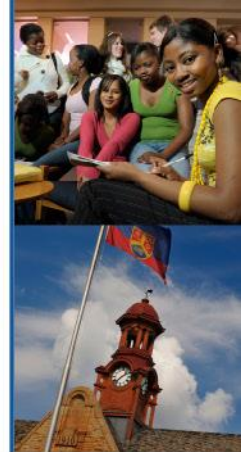
Simulation Design: Capital and Labour Shocks

For S1 we temporarily reduced industry-specific K and aggregate L

Why did we envisage the strike as a temporary loss of industry-specific K, instead of L?

- Reducing industry-specific K will endogenously lower industry-specific L, no need to make both idle

- Dormant K is equally important to the loss of production

- We want industry-specific L to be endogenous in our model to allow for catch-up production in the second half of the year (no catch-up possible if exogenous)

- Results show with K down 10% for the industry, L falls by around 7.5% and output by almost 9% in the strike year – this is realistic in our opinion

- Obvious alternatives do not work…

Simulation Design: ERoR Shocks
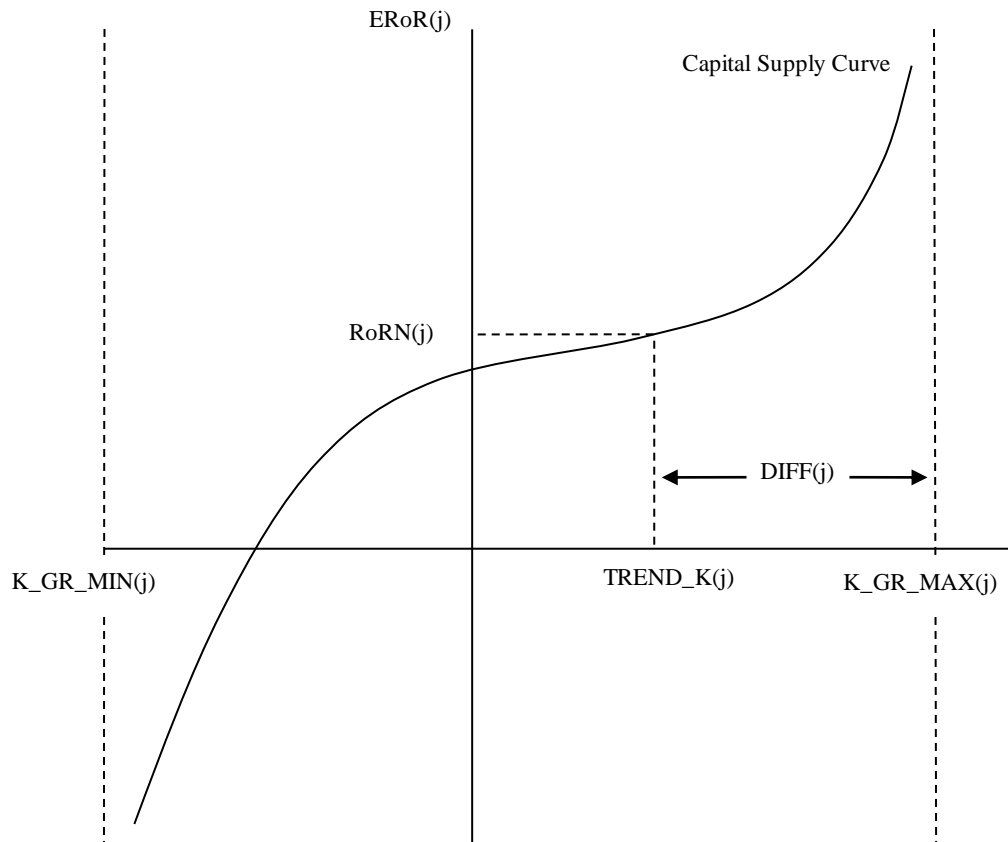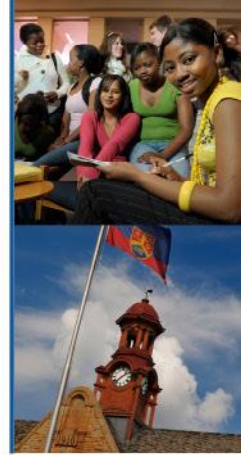
Simulation Design: Summary of S1

| S1: Direct Impact of the Strike Only		
2014	**2015**	**2016-2020**
✓ Hold weighted amount of capital in the platinum industry dormant for the duration of the strike ✓ Hold weighted amount of overall labour in the economy dormant for the duration of the strike, but rely on model to reduce labour at industry level by an appropriate amount ✓ Keep investment in the platinum industry on its baseline path by allowing the capital supply curve to shift until the new ERoR just results in normal capital growth	✓ Reinstate the K and L held dormant in 2014 ✓ Fully return the capital supply curve / ERoR schedule in the platinum industry to its baseline path	✓ No further exogenous shocks, endogenous variables react to shocks in the first two periods

Simulation Design: Summary of S2

S2: Direct Impact of the Strike + Wage Settlement		
2014	**2015**	**2016-2020**
✓ Same shocks as in S1 ✓ Increase wages in platinum industry by settlement amount (f1lab_o)	✓ Same shocks as in S1	✓ No further exogenous shocks, endogenous variables react to shocks in the first two periods
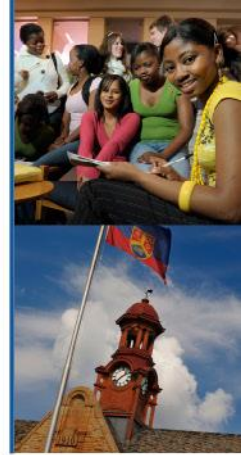
Simulation Design: Summary of S3 & S4

S3: Strike + Wage Settlement + Temporary Harm to Investor Confidence

2014	2015	2016-2020
✓ Same shocks as in S2 ✓ Reduce investment in platinum industry by weighted amount	✓ Same shocks as in S2, but only move the capital supply curve / ERoR schedule back halfway to its baseline path	✓ Fully return the ERoR schedule to its baseline path in 2016 ✓ No further exogenous shocks

S4: Strike + Wage Settlement + Permanent Harm to Investor Confidence

2014	2015	2016-2020
✓ Same shocks as in S3	✓ Same shocks as in S3	✓ Move the ERoR schedule another 50% closer to its baseline path in 2016, but leave it there permanently below the baseline ✓ No further exogenous shocks

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Simulation Results: GDP, Consumption, Investment

% Deviation from Baseline	2014	2015	2016	2017	2018	2019	2020
Real GDP (Policy S1)	-0.73	0.04	-0.09	-0.05	-0.04	-0.03	-0.01
Real GDP (Policy S2)	-0.72	0.04	-0.08	-0.04	-0.03	-0.02	-0.01
Real GDP (Policy S3)	-0.78	-0.02	-0.09	-0.14	-0.11	-0.08	-0.05
Real GDP (Policy S4)	-0.78	-0.02	-0.18	-0.15	-0.18	-0.19	-0.20

% Deviation from Baseline	2014	2015	2016	2017	2018	2019	2020
Consumption (Policy S1)	-0.67	0.41	-0.10	-0.02	-0.03	-0.02	-0.01
Consumption (Policy S2)	-0.63	0.38	-0.07	0.00	0.00	0.01	0.02
Consumption (Policy S3)	-0.86	0.27	0.26	-0.03	0.01	0.01	0.02
Consumption (Policy S4)	-0.86	0.27	0.08	-0.02	-0.01	0.00	0.01

% Deviation from Baseline	2014	2015	2016	2017	2018	2019	2020
Investment (Policy S1)	-1.11	-0.22	0.05	0.06	0.09	0.10	0.11
Investment (Policy S2)	-1.00	-0.21	0.03	0.04	0.07	0.09	0.11
Investment (Policy S3)	-1.75	-1.16	-0.13	0.11	0.16	0.20	0.22
Investment (Policy S4)	-1.75	-0.69	-0.70	-0.69	-0.58	-0.48	-0.39

Simulation Results: Metal Ores Industry S1 & S4

% Deviation from Baseline	2014	2015	2016	2017	2018	2019	2020
Real GDP (Policy S1)	-0.73	0.04	-0.09	-0.05	-0.04	-0.03	-0.01
Real GDP (Policy S2)	-0.72	0.04	-0.08	-0.04	-0.03	-0.02	-0.01
Real GDP (Policy S3)	-0.78	-0.02	-0.09	-0.14	-0.11	-0.08	-0.05
Real GDP (Policy S4)	-0.78	-0.02	-0.18	-0.15	-0.18	-0.19	-0.20

% Deviation (Policy S1)	2014	2015	2016	2017	2018	2019	2020
Output (MetalOres)	-8.49	-0.03	-0.16	-0.12	-0.10	-0.07	-0.04
Prices (MetalOres)	5.64	-0.13	-0.01	-0.01	-0.02	-0.03	-0.04
Capital (MetalOres)	-10.00	0.00	-0.25	-0.21	-0.19	-0.17	-0.14
Labour (MetalOres)	-7.01	-0.17	-0.13	-0.10	-0.07	-0.05	-0.02

% Deviation (Policy S4)	2014	2015	2016	2017	2018	2019	2020
Output (MetalOres)	-8.69	-0.86	-1.82	-2.09	-2.24	-2.33	-2.37
Prices (MetalOres)	5.81	0.42	1.04	1.22	1.32	1.38	1.42
Capital (MetalOres)	-10.00	-0.72	-1.94	-2.31	-2.53	-2.69	-2.78
Labour (MetalOres)	-7.62	-1.33	-2.10	-2.29	-2.41	-2.48	-2.51
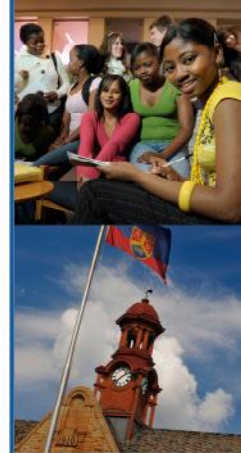
Simulation Results: Summary

- Given the nature of the S1 to S4 simulation design, we expect the impacts on the economy to become progressively worse under each successive scenario, relative to the baseline, so no surprises there

- Platinum industry output falls between 8.4% and 8.8% in 2014

- K falls by 10% but L only by 7.5% - why?

- P rises, increases MPL, mines are worked harder post-strike

- GDP falls by almost 0.8% in 2014 – worth around R23bn

- By 2020, PGMs down only 0.04% in S1, but down 2.3% in S4

- Most industries lose, biggest losers outside of metal ore mining are the construction and iron & steel industries

- Role of investment is obviously critical to growth

- Should higher wage settlements expand across the entire mining sector, the impact on the sector will be more severe

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
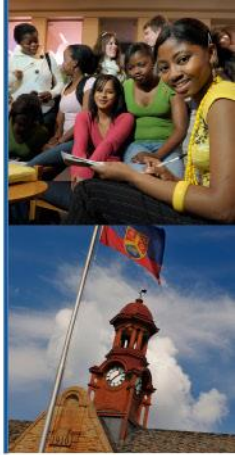Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Conclusion: Modelling

- Modelling an industry-specific labour strike can actually be thought of, and modelled, as a capital strike!

- The impact of the strike on industry-specific investment expenditure can be accommodated through an endogenous shift in the capital supply curve / ERoR schedule

- There are some things we still want to improve on, such as the details of foreign capital ownership and specification of multiple households

Conclusion: General

- The impact of a loss in investor confidence is large

- At a national level we have already seen credit rating downgrades due to poor growth and increasing debt

- At an industry level the big mines have started selling or restructuring some of their assets – retrenchments, increased mechanisation of mines, more strikes…

- Overall, workers are not getting a good deal when they strike, unions are not really helping, labour market problems are deep-rooted with no quick fix to the low productivity & high unemployment problem

Thank you

Comments and questions are welcome

Appendix: Simulation Results for 2015

- Recovery in 2015 seems very strong, especially consumption and employment – what is the good news?

- As it turns out, there is no good news or welfare gain

- C increases above base in 2015, but I falls below base

- Despite I in the platinum industry kept on the baseline, total I falls by more than GDP in 2015

- Construction goods form the bulk of I expenditure

- I in the construction industry falls significantly in 2014 and therefore starts 2015 with a low level of capital, relative to the baseline

- From 2015 onwards, I is necessary to rebuild, but with construction 'scarce' combined with high demand in 2015, prices jump above base (high K intensity, low primary factor substitution causes inelastic supply)

- As a result, the investment price index rises by more than CPI in 2015

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

Appendix: Simulation Results for 2015 (continued)

- Assumed to spend fixed proportion of nominal income on consumption and save the rest

- To determine real values of C and S, nominal values are divided by respective price indices – real value of S falls relative to real value of C

- What looks like a welfare gain when C is increasing in 2015 is actually bad news for South Africa – we are delving into our savings to buy consumption goods

- From 2016 onwards, all scenarios except S4 show a gradual recovery back towards the baseline (S4 includes permanent shift in ERoR)