

PHILLIPS CURVE IN AUSTRALIA AT DIFFERENT LEVELS OF GDP

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ABSTRACT

Australia is classified as a high-income country by the World Bank. In 2021, it had a Gross Domestic Product of 1.5 trillion dollars and a GDP per capita of 59,900 dollars.¹ Being a developed country, Australia has faced volatility in terms of its unemployment rates and inflation rates. However, despite such volatility, Australia has always had inflation on the lower side. It might sound like a utopian situation to many Indians, but in fact, it has had many worries in Australia. The Reserve Bank of Australia (RBA) set a target inflation band of 2-3% around the 1990s. In recent years, the inflation rate has undershot this target. Low inflation leads to demand subsiding, and risks the economy slipping into a recession, a problem being gravely faced by Japan.

Keywords: GDP, World Bank, RBA, Economy, Inflation.

Introduction

In this context, and Australia being a developed economy, it would be interesting to study does the primary and simple concept of the Phillips curve exist in the case of Australia. Not only this, but it would also be interesting to analyze whether the existence of this relationship, in any way, shape, or form, is affected by the level of GDP. As we will see in the next section, Australia got classified as a high-income country long ago, and even though its annual growth rate has not been consistently high for long periods of time, it still has managed to grow considerably.

Objectives

- To understand whether the simple wage Phillips Curve exists for Australia, at different levels of gross domestic product (GDP).
- To understand whether a country's level of the gross domestic product has an impact on the relationship between the unemployment rate and the rate of increase in money wages (inflation).

Research Methodology

Authors have considered Secondary Data, in terms of national-level unemployment rates and inflation rates for Australia, for the time period of 1960-2020. In order to analyze the relationship of the Phillips Curve at different levels of GDP, the authors have divided the total period of consideration (1964-2020) into three parts (1964-1980, 1981-2000, 2001-2020). Data for unemployment rates prior to 1964 was not available. The authors have manually plotted the Phillip Curves, and have used Microsoft Excel for the same. The slope of the Phillips Curve is derived linearly from the data. The relevant data points are collected from the websites of IMF, World Bank, and Macro Trends.

Australia's Economy

According to the latest classification released by the World Bank,² a country having a Gross National Income (GNI) per capita of more than 13,205 US dollars, would be classified as a high-income country.

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Table 1: World Bank Income Classifications

Group	GNI/Per Capita (USD)
Low Income	< 1,085
Low-Middle Income	1,086 - 4,255
Upper-Middle Income	4,256 - 13,205
High Income	> 13,205

According to this, Australia was classified as a Low-Middle income country from the 1960s, upgraded to an Upper-Middle income country in 1973, and finally, to a high-income country in 1988. Of course, the exact classifications have changed over time, and there are technicalities when it comes to adjusting for inflation, but the general point being made here is that Australia has been a High-Income country for a long time. Not only that but since 1988, Australia has grown a lot. In 1990, Australia's GNI per capita³ was 17,330 US dollars, and a GDP of 311 Billion dollars. Fast-forward to 2021, its GNI per capita is at an astonishing 56,760 US dollars, and its GDP is a whopping 1.5 trillion dollars.⁴

It is for this reason that, the authors have divided the period of consideration into 3 distinct parts. Even though Australia became a high-income country in 1988, it has undergone many changes since then.

Phillips Curve

Now that we have given the context of Australia's economy, let us talk about the Phillips Curve a little. In 1958, A.W. Phillips, then a professor at the London School of Economics, published a very exhaustive study on wage behavior in the United Kingdom. The findings were then reproduced in his article, and the concept of the 'Phillips Curve' was born. A formal definition:

*"Phillips Curve is an inverse relationship between the rate of unemployment and the rate of increase in money wages. The higher the rate of unemployment, the lower the rate of wage inflation."*⁵ In simpler words, there was essentially a trade-off between unemployment and inflation. Either the policymakers could target lower inflation, at the cost of high unemployment, or can target lower unemployment, at the cost of higher inflation.

Though the Phillips curve was extensively used by economists and policymakers after it was introduced, its usage and the practical application started to wear off. That is where this concept evolved, bringing in the role of inflation expectations, and making the concept more reliable.

However, slowly, this concept lost its usefulness, especially in developed countries. These days, there are a few papers that dive deep into the concept, and by changing the model to account for discrepancies, many economists have found the concept to still be relevant, in this day and age.

Literature Review

In August 2021,⁶ James Bishop and Emma Greenland conducted an exhaustive study into Australia's Phillips curve, to understand whether this 'curve' is actually a curve or a straight line. The main objective of their paper differs from our focal point because we merely looking if the Phillips Curve holds at all for Australia, at different levels of GDP. However, some important observations can be derived from the paper. Firstly, the paper concluded that at different levels of unemployment, the Phillips Curve behaves differently.

They concluded that the Phillips curve at unemployment rates of 7.5 percent and above is completely flat. It gets steeper when the unemployment rate drops to 5.5 percent or below and gets even steeper when the unemployment rate drops below 4 percent. The level of steepness at 4 percent is thrice more than that of the curve at 5.5 percent. This implies that, in Australia, the wage growth rate, or inflation, is not responsive when there is excess spare capacity in the economy. It gets more responsive as the employment rate starts to drop, and spare capacity starts getting utilized.

Another important point to note is that they did not consider aggregated national-level data. In fact, in order to capture more movement of the relationship between growth rates of wages and unemployment, they captured data from 290+ local labor markets.

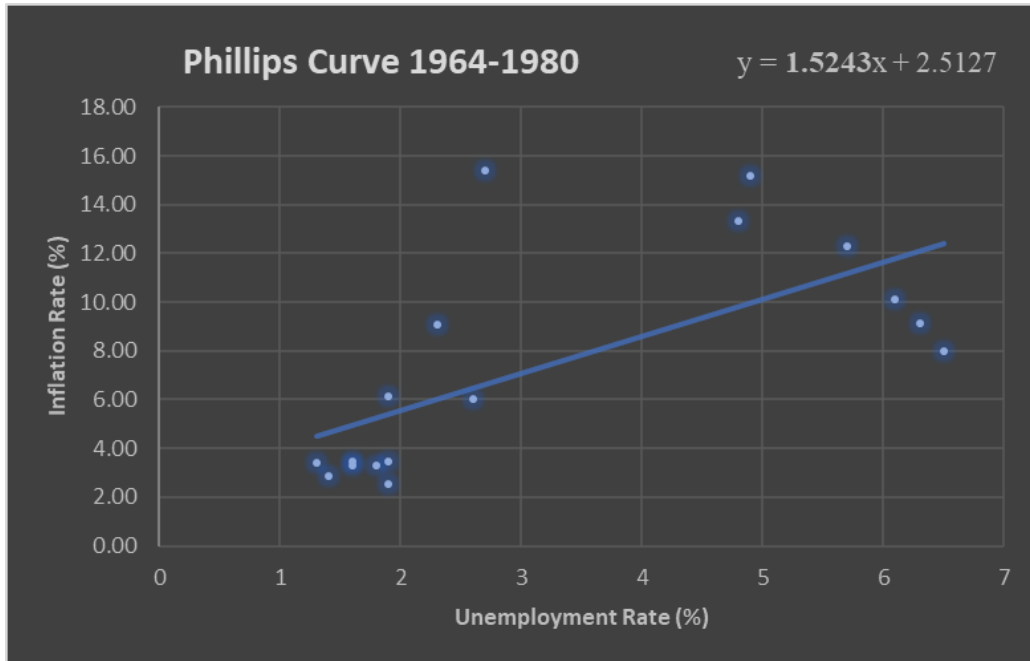
Bishop & Greenland also, first estimated a linear Wage-Phillips Curve model, with the local labor market data they had collected. They found that the Phillips Curve is negatively sloped, and the slope of the curve is -0.27.

This means that an increase of 1 percentage point in unemployment, will lead to a decrease of 0.27 percentage points in the annual growth of wages, on average.

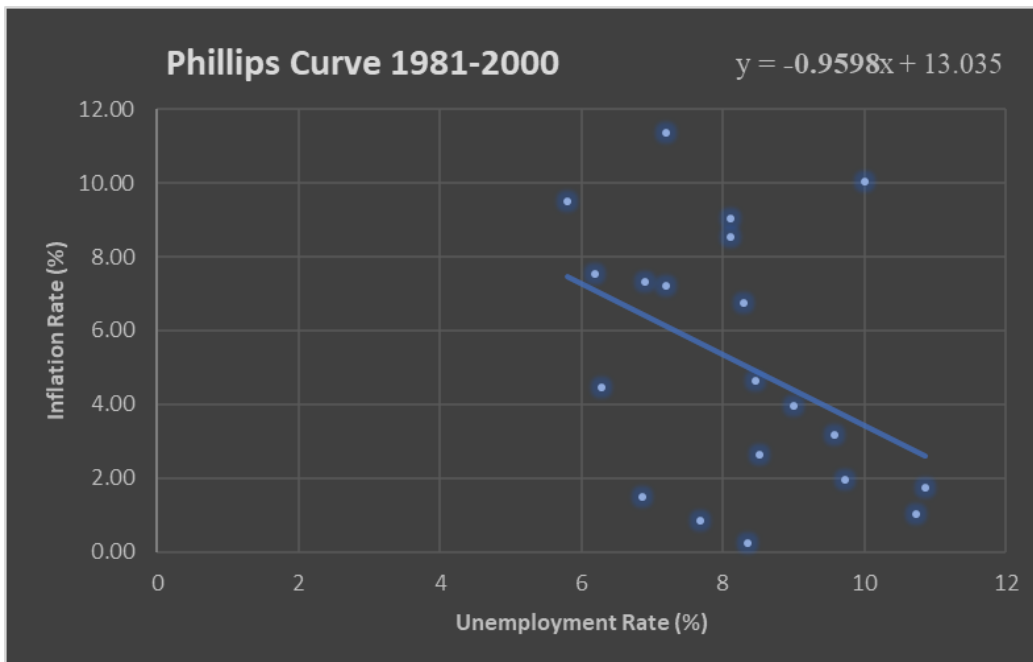
Data & Analysis

Now that we have all the context, let us look at the relevant data, and plot the Phillips curve accordingly. Please refer to tables 2 to 4 in the appendix to get the data that the authors used to plot the Phillip Curves.

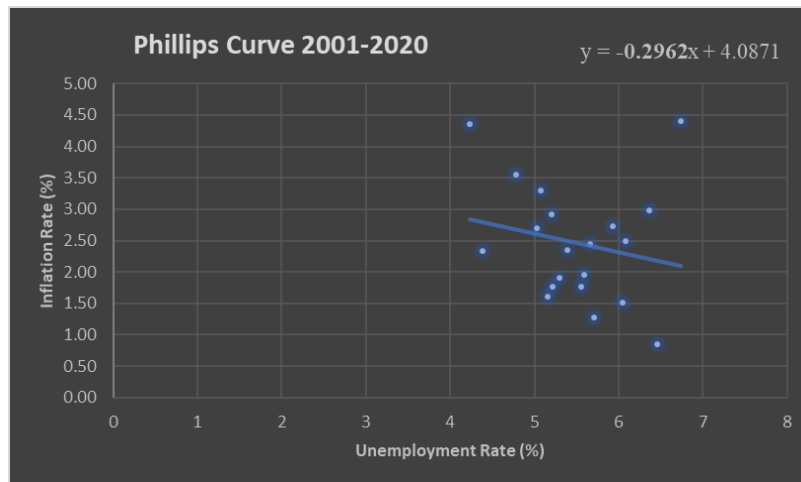
- **Years 1964-1980**

**Graph 1**

- **Years 1981-2000**

**Graph 2**

- **Years 2001-2020**



Graph 3

As we can see from the graphs, even though we have kept our definitions and datasets simple, we can see that the Phillips Curve exists for Australia for two periods, i.e., for the years 1981-2000, and the years 2001-2020. The relationship between the unemployment rate and the wage rate (inflation), is very much apparent for the years 1981-2000. The slope of the curve is -0.96, which implies that if the unemployment rate goes up by 1 percentage point, then the inflation rate will reduce by 0.96 percentage points, on average.

Similarly, for the years 2001-2020, the slope of the curve is -0.3. Though flatter than the one for 1981-2000, it still holds statistical significance, as for these years, if the unemployment rate goes up by 1 percentage point, then the inflation rate would reduce by 0.3 percentage points., on average. The striking graph, however, is for the years 1964-1980. Here, the relationship between the unemployment rate and the inflation rate has been completely reversed. The slope of the curve is 1.5, meaning that if the unemployment rate went up by 1 percentage point, the inflation rate would go up by 1.5 percentage points, on average. We can definitely conclude that Australia faces a trade-off between unemployment and inflation at an inconsistent rate.

Now, why is this the case? Of course, the reverse of the Phillips curve relation being observed in the first graph had its reasons. One of the reasons for this is attributable to the 1971-75 period when Australia faced serious stagflation. Up until this point, Australia was facing low inflation and low unemployment rates, and there were no demand or supply shocks, nor were there any sudden technological or economical innovations. This changed in the 1971-1975 period, when suddenly, due to demand and supply shocks, Australia started facing high unemployment and inflation rates, together. Various internal and external factors were causing this issue, and Australia's response, through public policy, was lackluster. Australia faced another round of recession in the 1980s. This time around, inflation went back down and did not come back up. Australia had achieved low inflation, but as a consequence, its unemployment rate had shot through the roof. This may explain the apparent positive relationship between unemployment rates and inflation rates, which Australia experienced from 1964 to 1980.⁷

After that, Australia did manage to bring down employment rates to a band of 4-6% on average.

The Global Financial Crisis (GFC) of 2008 did contribute to some spikes in unemployment rates, but Australia did not sustain much damage and was able to recover rather quickly. This was because Australian banks were not exposed much to the US banks. Additionally, right after the GFC, Australia indulged in expansionary fiscal policy, and with large resource exports to China, was able to cope with GFC quite well.⁸

Fast-forward to recent years, Australia's low inflation rates have now become a source of concern. There are a few reasons attributable to low inflation rates in Australia. The first one is Australia's wage-setting process. As RBA governor Philip Lowe quoted, "Wage-setting processes – including multi-year enterprise agreements and the annual minimum wage case – impart a degree of inertia into aggregate wage outcomes."

The second one is the strong cost-control mindset that businesses have. Most businesses are hesitant to structurally increase wages and would opt for retaining staff via bonuses or other monetary incentives. Third of all, many believe that inflation expectations play a major role in determining the actual inflation rates. In Australia, even inflation expectations are low.⁹

Limitations of the Study

National Aggregated Data was used, which led to a lot of biases in terms of not being able to capture the more volatile domestic labor market data, which can cause the relationship of the Phillips Curve to not be properly depicted. We are also considering a time frame of 20 years, in three parts (1964-1980, 1980-2000, 2000-2020), so short-run expectations will play little to no role in determining the Phillips Curve.

Long-run expectations also get affected by unemployment rates, also hindering the display of the Phillips Curve. Additionally, we have only considered the inflation rate and unemployment rate, which are very simple measurements. The role of inflation expectations, the NAIRU (Non-Accelerating Inflation Rate of Unemployment), or the output gap has not been calculated, so the practical application of this study is severely hampered.

Lastly, the authors were not able to find unemployment data for Australia for the years 1961, 1962, and 1963, which may have hampered the results.

Conclusions

As we saw, the relationship between the unemployment rate and the inflation rate for Australia has been inconsistent, over a period of time. That being said, we were able to observe how the Phillips curve does in fact exist, for the time periods of 1981-2000 and 2001-2020. Though if we use more modern concepts of the Phillips Curve, our conclusions might differ, and it may not even exist for many developed countries. But, developing countries can still draw insights from Australia's example, and understand the do's and don'ts when it comes to managing inflation and unemployment rates.

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Appendix

Table 2: Unemployment & Inflation Rates (1964-1980)^{10,11}

Year	Unemployment Rate	Inflation Rate
1964	1.4	2.87
1965	1.3	3.41
1966	1.6	3.29
1967	1.9	3.48
1968	1.9	2.52
1969	1.8	3.28
1970	1.6	3.44
1971	1.9	6.14
1972	2.6	6.02
1973	2.3	9.09
1974	2.7	15.42
1975	4.9	15.16
1976	4.8	13.32
1977	5.7	12.31
1978	6.5	8.00
1979	6.3	9.12
1980	6.1	10.14

Note: Unemployment Data was available only from 1964

Table 3: Unemployment & Inflation Rates (1981-2000)^{10,11}

Year	Unemployment Rate	Inflation Rate
1981	5.8	9.49
1982	7.2	11.35
1983	10	10.04
1984	9	3.96
1985	8.3	6.73
1986	8.1	9.05
1987	8.1	8.53
1988	7.2	7.22
1989	6.2	7.53
1990	6.9	7.33
1991	9.58	3.18
1992	10.73	1.01
1993	10.87	1.75
1994	9.72	1.97
1995	8.47	4.63
1996	8.51	2.62
1997	8.36	0.22
1998	7.68	0.86
1999	6.87	1.48
2000	6.28	4.46

Table 4: Unemployment & Inflation Rates (2001-2020)^{10,11}

Year	Unemployment Rate	Inflation Rate
2001	6.74	4.41
2002	6.37	2.98
2003	5.93	2.73
2004	5.39	2.34
2005	5.03	2.69
2006	4.78	3.56
2007	4.38	2.33
2008	4.23	4.35
2009	5.56	1.77
2010	5.21	2.92
2011	5.08	3.30
2012	5.22	1.76
2013	5.66	2.45
2014	6.08	2.49
2015	6.05	1.51
2016	5.71	1.28
2017	5.59	1.95
2018	5.3	1.91
2019	5.16	1.61
2020	6.46	0.85

