



PHILO CAPITAL ADVISERS

FOLLOW THE LEADER

DOES THE AUSTRALIAN STOCK MARKET
PLAY “FOLLOW THE LEADER” TO THE US?

IF SO, HOW AND WHY?



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PHILO VANTAGE POINT

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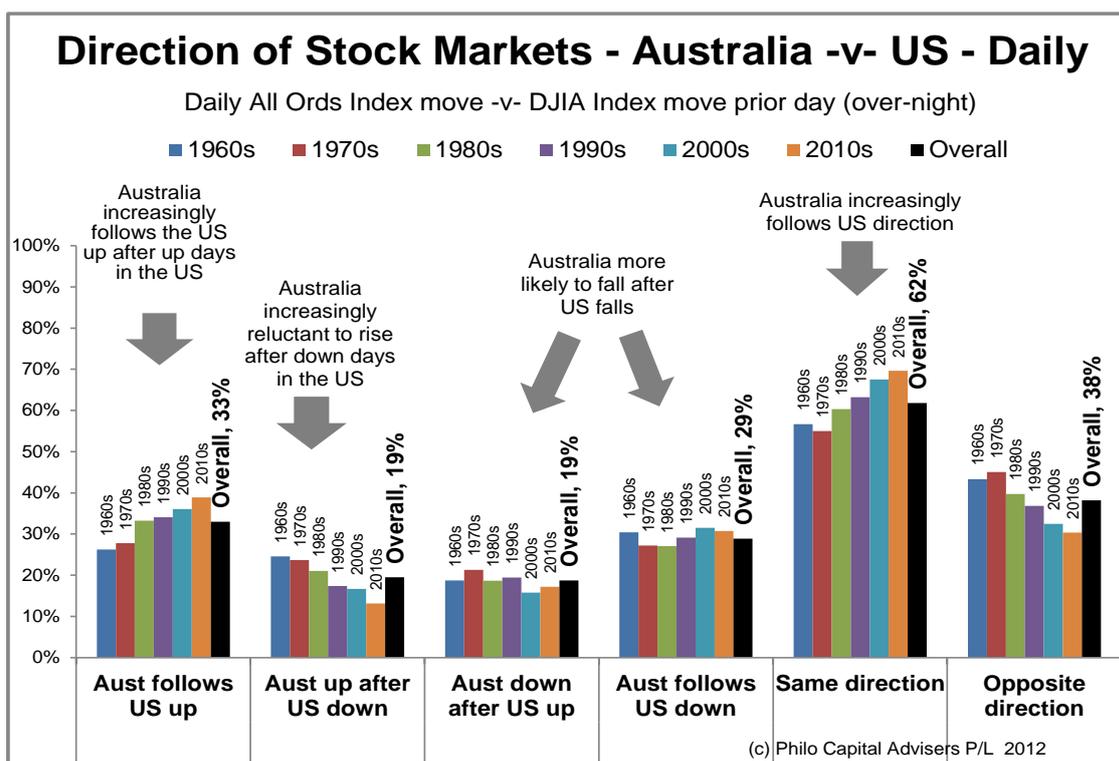
Introduction

When discussing the prospects for Australian shares, probably the most frequently used phrase by investors, commentators and the financial press in Australia has been “let’s see what the US did last night”. It is as if Australian investors are always looking for guidance from the US, but does the Australian market actually follow the US market? If so, how and why?

This paper explores the links between the Australian and US stock markets in respect of daily, weekly, monthly, quarterly and yearly movements, and makes some observations about trends and possible causes.

Daily stock market movements

The Australian stock market follows the direction of the US market overnight on 70% of all trading days and goes the opposite direction on only 30% of trading days. This wasn’t always the case. The direction of the Australian market only followed the direction of the US market overnight around 55% of the time in the 1960s and 1970s, but has risen steadily to 70% of the time in the 2010s.



The increase in this “follow the leader” effect on daily market movements has been due mainly to an increasing tendency for the Australian market to rise after the US market has risen overnight (left set of bars in the above chart). Australia hasn’t changed its tendency to follow the US down (4th set of bars), but has decreased its willingness to rise after falls overnight in the US (2nd set of bars). So, bullishness in the US market has become increasingly contagious in influencing the next day’s trade in Australia over the past 5 decades, but bearishness in the US market has not become any more contagious over time.

This increase in the “follow the US” effect over recent decades (due to increasingly contagious bullishness) has been driven by several factors, including:

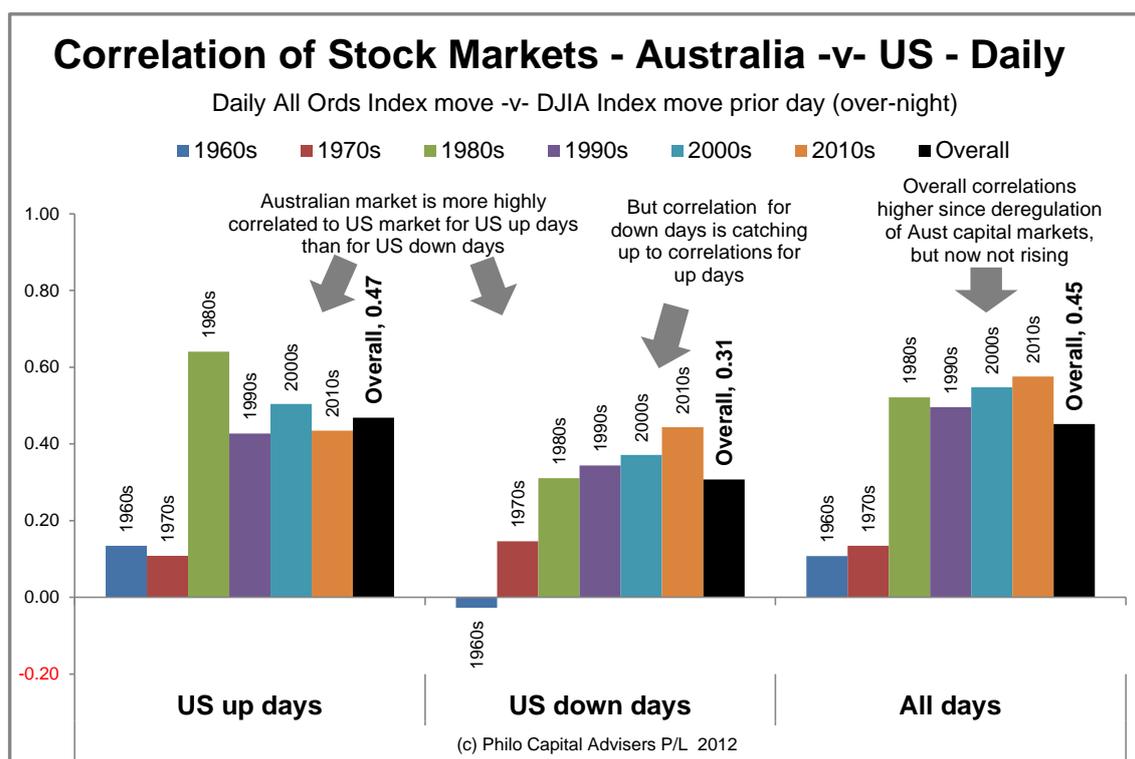
- Increasing globalisation of Australian listed companies – with revenues and profits of Australian companies increasingly reliant on foreign markets (thus daily news and events are increasingly likely to affect local and global company performance)
- Increasing foreign ownership of Australian listed companies – with 40% of shares listed in Australia being owned by foreigners (although foreigners have always been a major source of capital for Australian businesses since the first settlement here)
- Increasing speed of communications and increasing globalisation of capital markets – trillions of dollars of hot money can now be switched between any number of markets within seconds and minutes.
- Increasing globalisation of investment banking, stockbroking and funds management industries

The Australian stock market is now just one small part of a seamless 24-hour global market in which money spins from market to market as one market closes and the next opens. News in one part of the world is transmitted instantly to buy & sell orders around the world. The US market is not only the largest stock market in the world (by market value and volume), but it is also the last major market to close before Australia opens, making the “follow the leader” effect inevitable.

Although there is a clear pattern of the Australian market following the US market, it is extremely difficult to make money from this consistent pattern because the moves in the US market are priced into the overnight futures prices of the Australian stocks and indexes in real time as they occur, and are already built into the opening prices when the market opens in Australia. Not even the bleary-eyed night traders at the big banks make money from this “follow the leader pattern”.

Correlations of daily movements

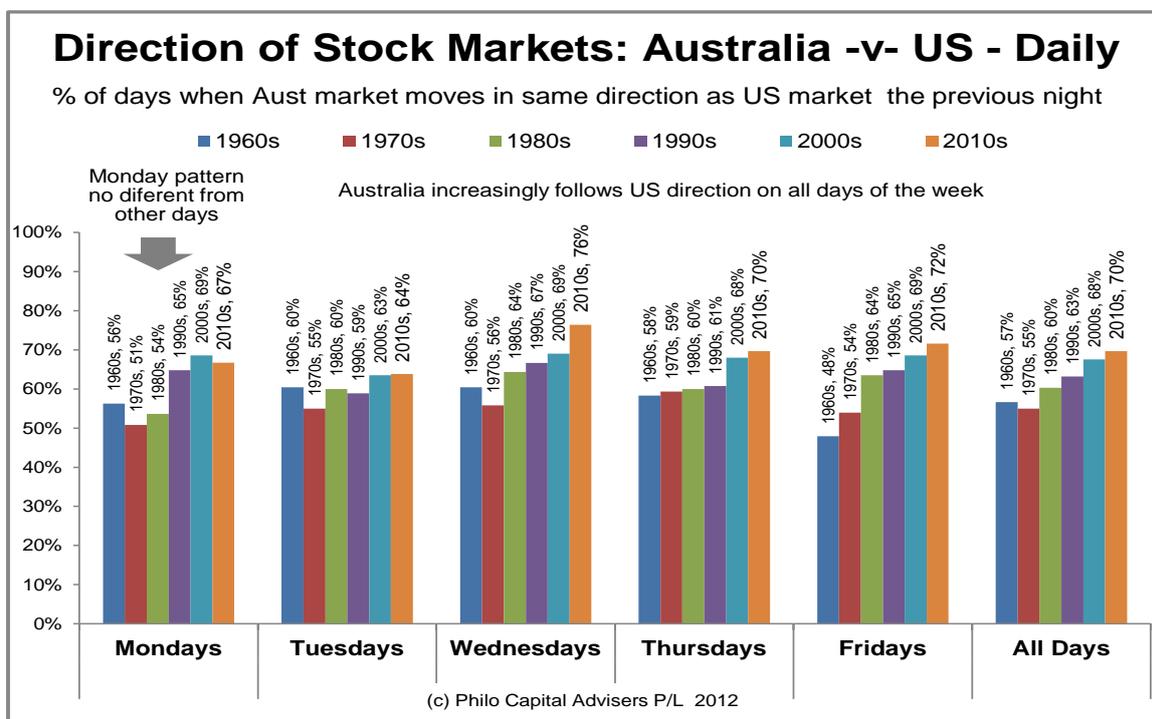
The mathematical correlations between daily moves on the Australian market versus the US market the previous day/night have been reasonably strong since deregulation of the Australian capital markets in the early 1980s:



We can see from this chart that, contrary to popular belief, the Australian market is more sensitive to rises on the US market the night before than to falls, as the correlations on up days in the US (1st set of bars) are higher than correlations on down days (middle set). These differences in correlation coefficients are statistically significant. This confirms our earlier observation that the Australian market has been more likely to catch contagious bullishness from the US market overnight than catch contagious bearishness from the US.

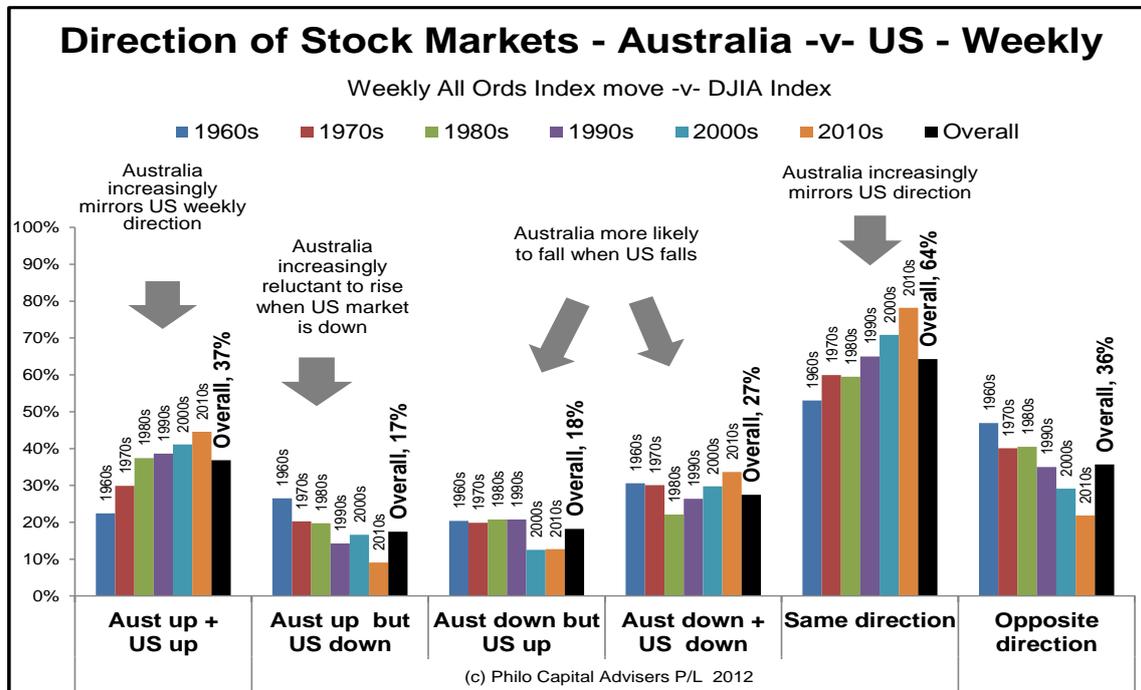
Different days of the week

This follow-the-leader pattern has been consistent on every day of the week. Even on Mondays, when Australian investors have had the weekend to think for themselves and form their own views about the prospects for Australian companies, the tendency to follow Friday's move in the US has been just as strong as on other trading days:



Weekly stock market movements

The pattern of weekly rises and falls in the Australian and US stock market indexes has been similar to the patterns of daily movements:

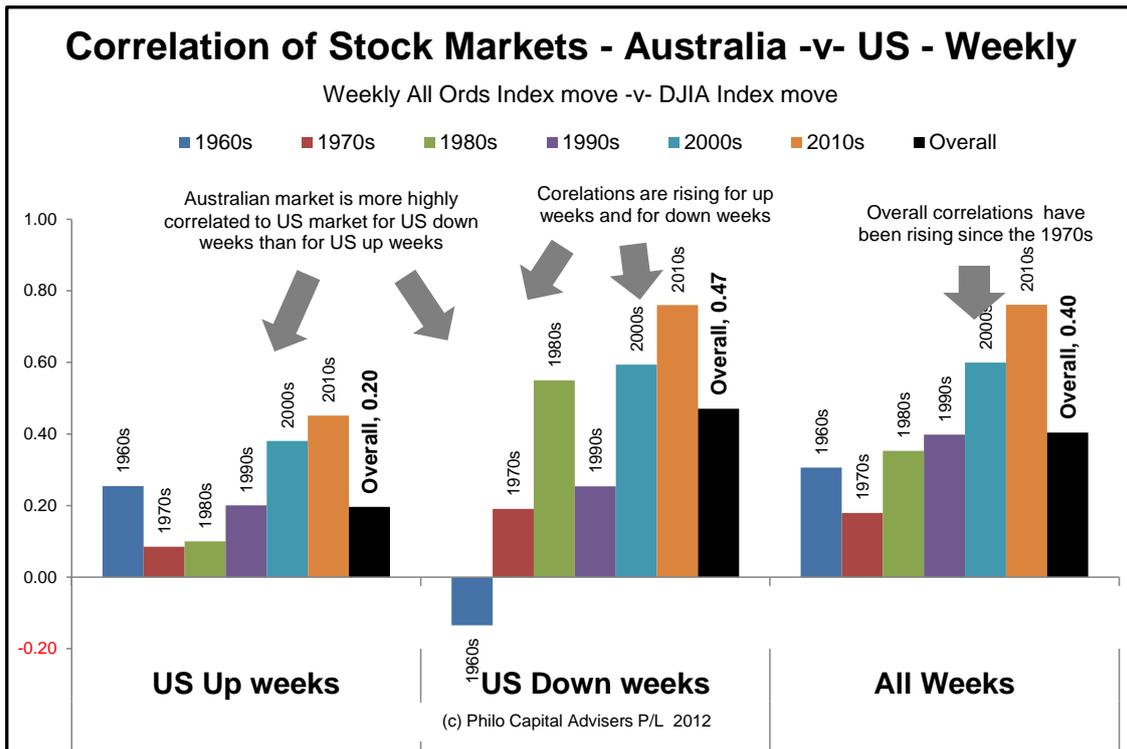


The weekly direction of the Australian market increasingly reflects the weekly direction of the US market. The weekly direction of the Australian market and the US market were the same (ie both up or both down together) 53% of the time in the 1960s but has been rising steadily to be 78% of the time in the 2010s.

The ability of the Australian market to achieve positive weeks in the face of negative weeks in the US has declined from 27% of the time in the 1960s to only 9% of the time in the 2010s.

Although the patterns of weekly stock market directions are similar to the patterns of daily directions, the mathematical correlations of weekly returns have been quite different from the correlations of daily returns.

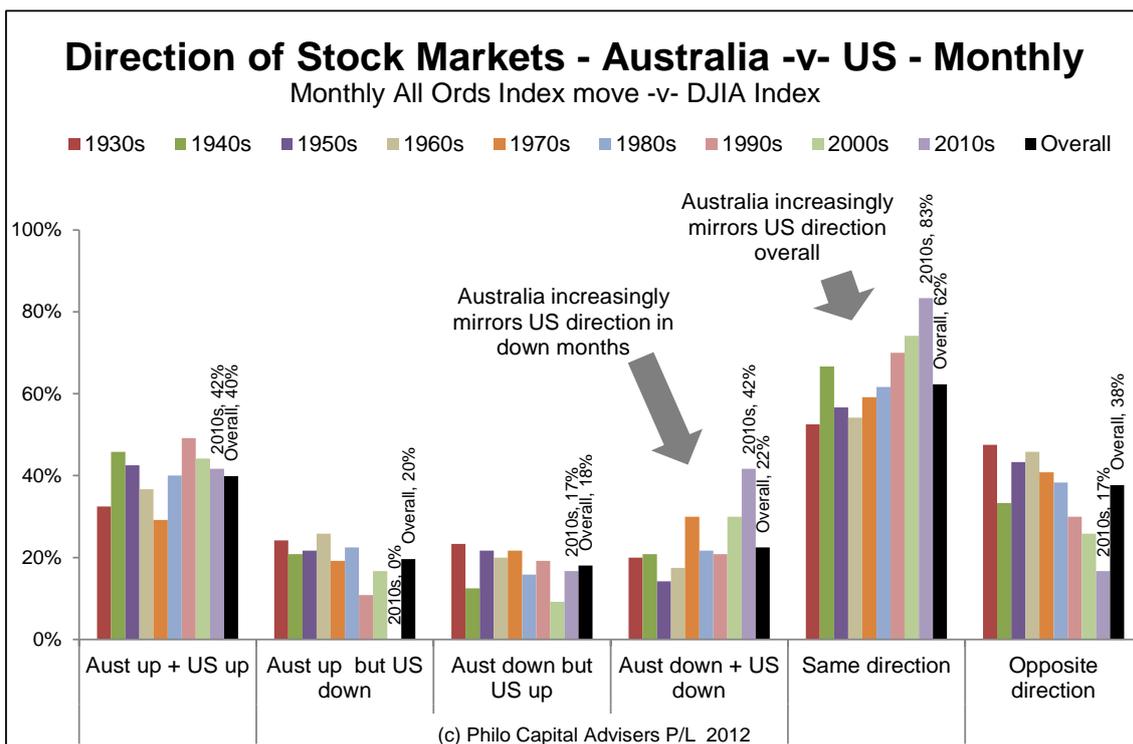
The Australian market follows the US market more closely in down weeks than in up weeks (which is the reverse of the daily return pattern), and the correlations of moves in down weeks and in up weeks have both been rising steadily since the 1970s.



Monthly stock market moves

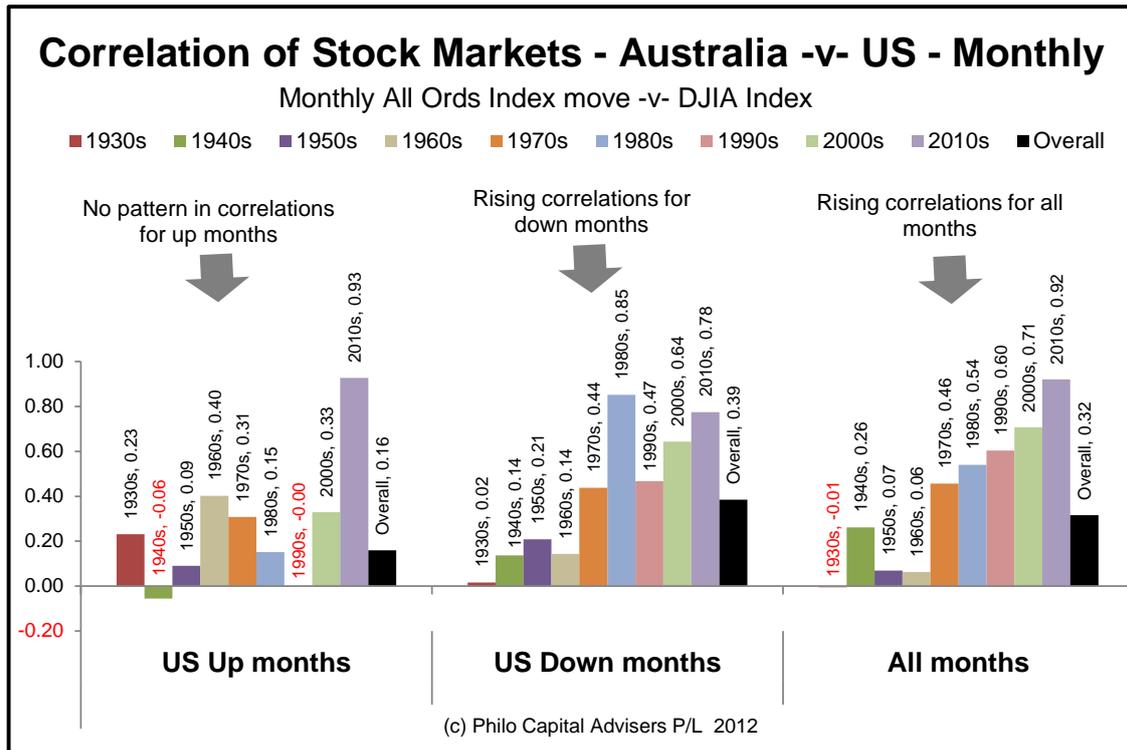
Whereas the patterns of daily and weekly stock market moves are very much influenced by short term reactions to the ongoing torrent of news (and noise) in the markets, monthly, quarterly and yearly stock market returns should in theory be more influenced by company specific factors that affect the outlooks for expected earnings and dividends, which ought to be less volatile and transient than the daily or weekly stock market gyrations.

Monthly movements starting from the 1930s:



Here we see that Australia has followed the US up in around 40% of months consistently; it has followed the US down around 20% of months consistently, and has gone down while the US went up in around 20% of all months. Overall, Australia has shown an increasing tendency to mirror the direction of the US market in respect of monthly moves, going in the same direction around 53% of months in the 1930s, but rising to 75% to 80% of months in the 2000s and 2010s, primarily because Australia has increased its tendency to follow the US market down for monthly moves.

We see this also in the correlations of monthly returns:

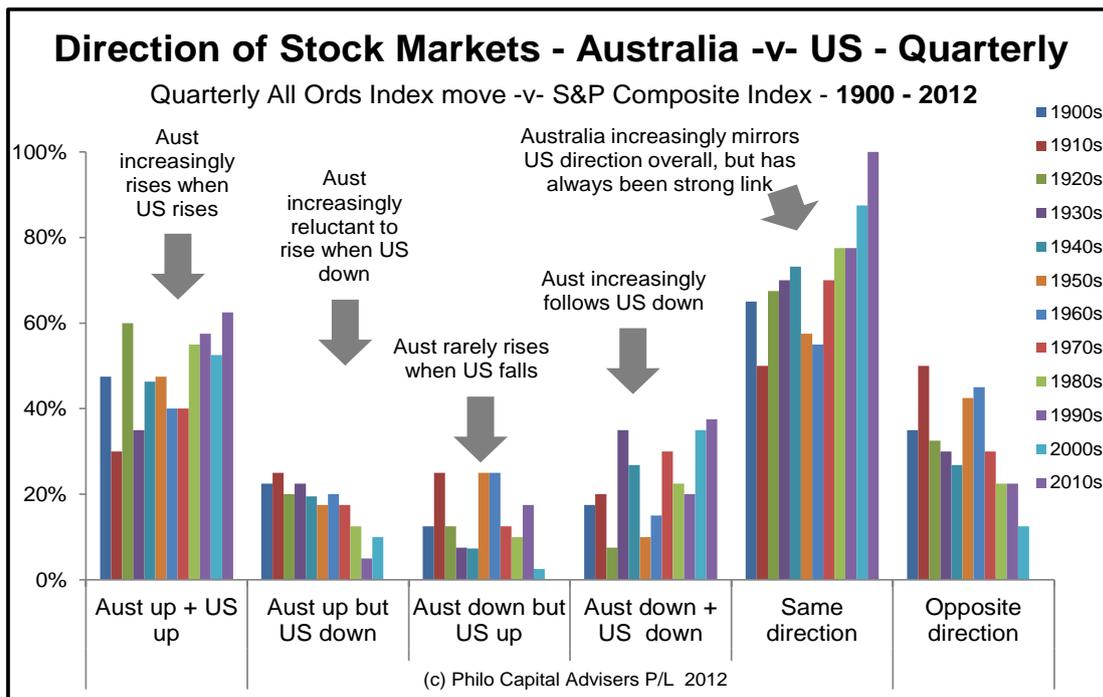


Here we see a similar pattern as the weekly moves – ie with steadily rising correlations between monthly movements on the US and Australian markets, due primarily to rising correlations in the negative months. Bad news transmits more powerfully than good news for monthly returns.

Quarterly stock market moves

One would expect that quarterly moves would be more driven by quarterly announcements of company results than by short term economic and market “noise”. Although US companies report quarterly compared to semi-annually for Australian companies, more and more Australian companies report key data on a quarterly basis, either because they have shares listed in other markets that require it, or because it is demanded by an increasingly global shareholder base.

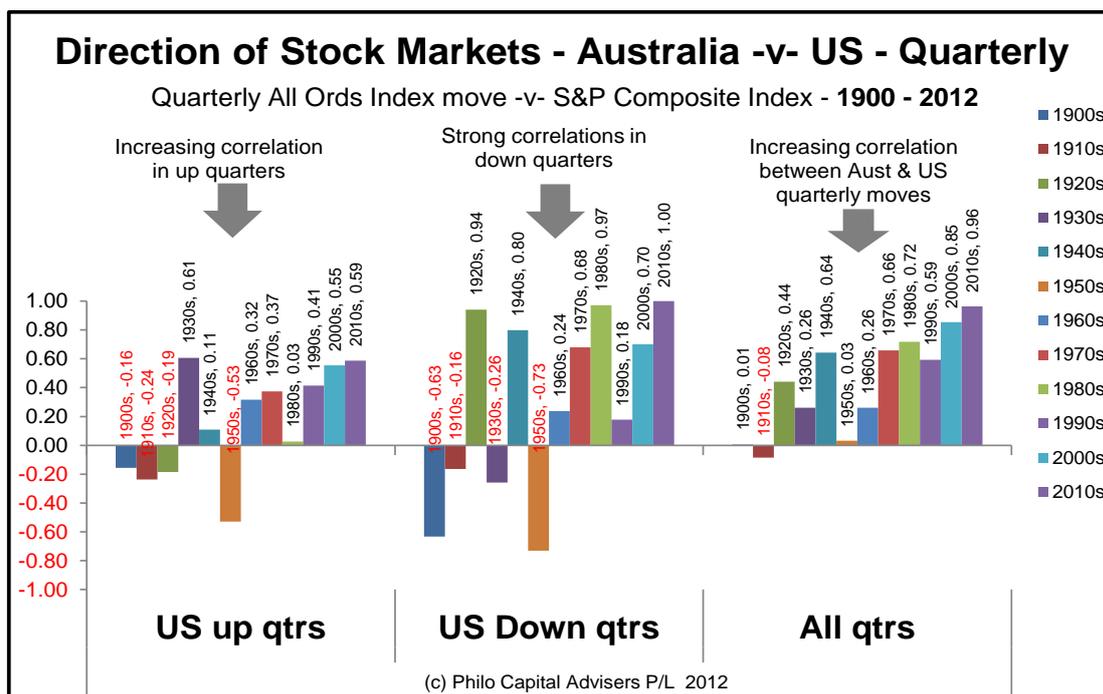
When comparing quarterly moves in the US and Australian broad market indexes over the past century we see firstly that the relationship between the US and Australian markets is stronger than for daily, weekly and monthly moves, and secondly that the link has become much stronger both on the downside (negative quarters) and on the upside (positive quarters).



For quarterly movements, the Australian market increasingly rises when the US rises (first set of bars), but the link has always been strong and has been consistently above 40% of quarters (apart from the 1910s and 1930s when it was a little lower). The Australian market is also increasingly reluctant to rise when the US is falling (2nd set of bars). Conversely, Australia has shown an increasing tendency to fall when the US market is falling (4th set of bars).

For quarterly movements, the Australian market now follows the US direction nearly all of the time (5th set of bars). The Australian market went the same direction as the US market 78% of quarters in the 1980s and 1990s, 88% of quarters in the 2000s, and 100% of quarters thus far in the 2010s. This tendency has always been strong, and has been around 60% or higher even in the first half of the 20th century.

The chart of correlations of quarterly returns shows similar patterns:



Correlations between the Australian and US market in respect of quarterly returns have been increasing steadily over the past century. There was no correlation at all in the 1900s and 1910s (nor in the 1950s), but was moderate in the 1920s, 1930s and 1940s, which were decades that were dominated by global macro events – the 1920s boom and crash, the 1930s global depression and the Second World War in the 1940s.

Correlations disappeared in the 1950s and were low in the 1960s when economies were driven largely by domestic factors – re-building domestic industries after the war effort, construction of housing and infrastructure with the baby-boom, rapid expansion of the domestic consumer finance industry, development of domestic manufacturing industries to meet the needs of rapidly rising domestic consumption, development of social safety nets and the expansion of government departments, and all stabilised by fixed exchanged rates and tight capital controls.

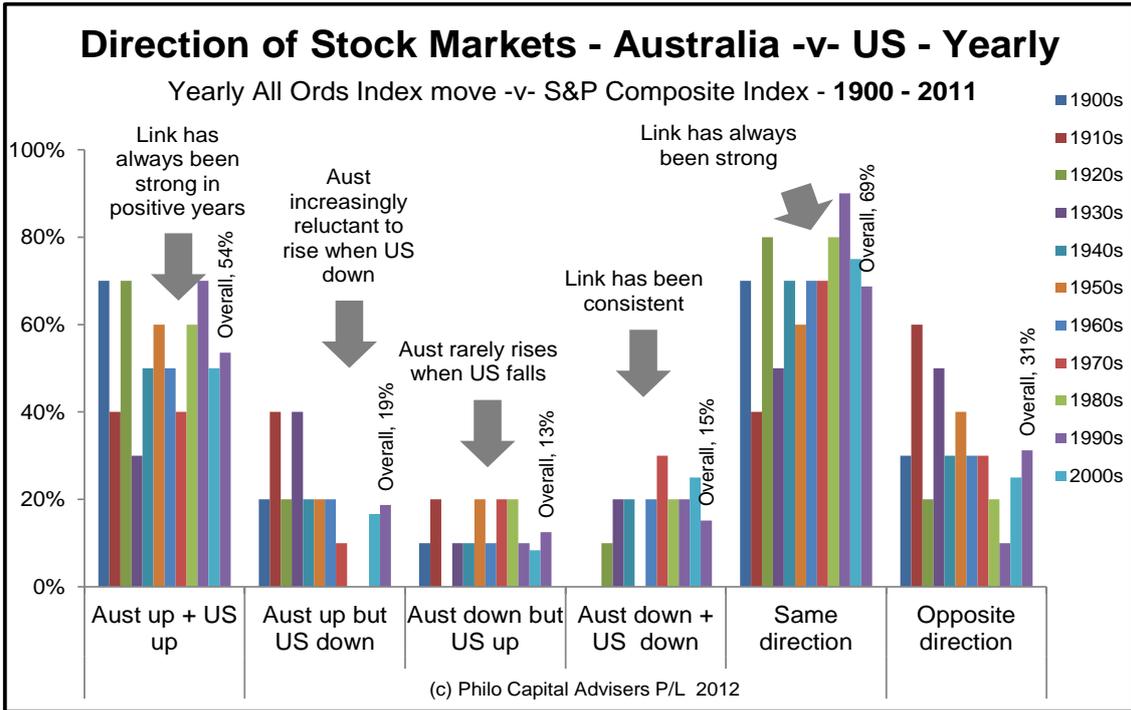
Correlations re-emerged and rose to high levels again in the 1970s, 1980s 1990s, 2000s and 2010s as post-war protection barriers were removed and global macro themes re-emerged to dominate domestic events.

- In the 1970s we had the global inflation crisis, the collapse of the gold standard, the middle east crises and oil price spikes, and political crisis in many countries (including the US and Australia (including to the impeachment/resignation of Nixon and the sacking of Whitlam).
- In the 1980s we saw global trends of disinflation, deregulation of markets, privatisation of industries, removal of capital controls, and the global entrepreneurial boom.
- In the 1990s we had the collapse of the 1980s boom into the global recession in the early 1990s, the collapse of the Japanese property market and banking systems, and then the global dot-com boom.
- In the 2000s the dot com boom turned into the global tech wreck recession and the global credit boom of the mid-late 2000s, which collapsed into the global recession.
- And now in the early 2010s we have the global impacts of the sovereign debt crisis and the slowdown in China.

Investor reactions to these global factors led to a return to high correlations between markets.

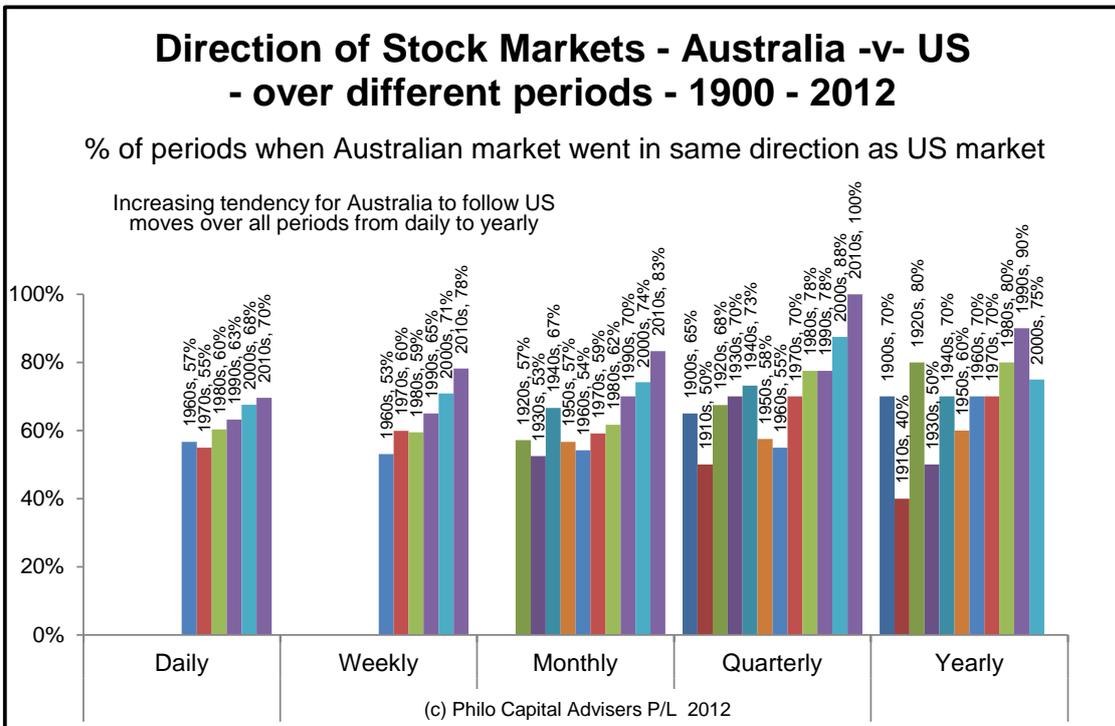
Yearly stock market returns

When we look at annual returns, the Australian and US stock markets have gone in the same direction in more than 2/3 of all years, and this has been fairly consistent for a century. Since 1900 both markets have risen together in 55% of years and both markets have fallen together in 15% of years, but they have gone in different directions in only 30% of years.

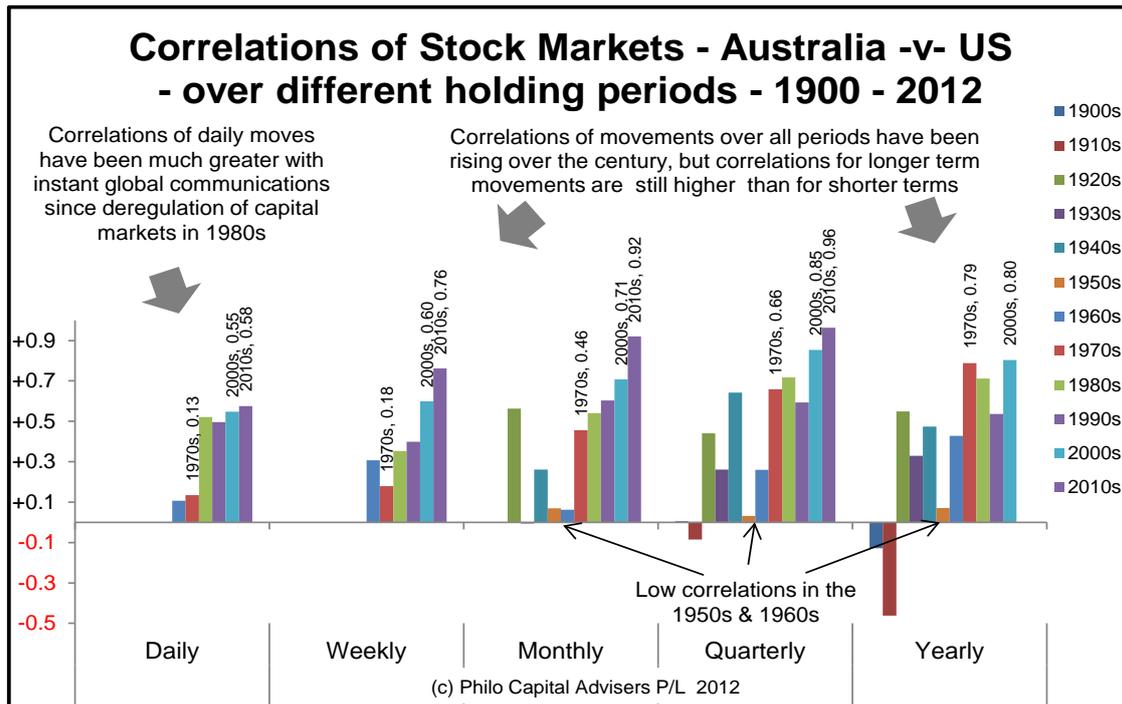


Different periods compared

When we compare the movements on the Australian and US markets over different holding periods we see an increasing tendency for the Australian market to mirror the direction of the US market over all periods from daily movements to yearly movements:



The next chart shows the correlations between movements on the Australian market and movements on the US market over different periods, and we observe a similar trend:



Apart from the increasingly strong links between movements in the two markets over time, we can see that the links between the two markets in respect of daily and weekly movements remain weaker than the link between the markets in respect of longer terms – quarterly, and yearly.

There was no link between the two markets in respect of daily and weekly movements before the 1980s because news, information and money could not flow quickly around the world before the advent of instant global communications, global trading and integrated global banking systems and capital markets. In the early part of the 20th century, news traveled by ship and took months to arrive, then even with the advent of international telephone and telegraph links in the early decades, capital controls and restrictions on global banking and trading restricted the free flow of money between markets. Only in the 1980s did instant global communications and deregulation of capital markets allow virtually instant trading between global markets, and allow movements in the US market to transmit to movements in the Australian market the next day.

The first of the last two charts shows that the broad direction of daily moves has been similar in the 1960s & 1970s as it has been since the 1980s, but the 2nd of charts shows that the extent of movements (measured by correlations) was effectively nil in the 1960s & 1970s but very significant since the 1980s. Before the 1980s the broad direction of moves in both markets followed similar patterns, but since the 1980s the weight of money from global trading has driven short term moves only when it became physically possible to shift billions of dollars between markets with new technologies in deregulated capital markets since the 1980s.

However, despite there now being a strong link between the US and Australian markets in respect of daily and weekly movements since the 1980s, these links are still not as strong as the links in respect of longer term movements – monthly, quarterly and yearly. This means that, despite the daily news affecting global markets virtually instantly and causing daily volatility on a global basis, the links between the Australian and US markets in respect of monthly, quarterly and yearly movements are still stronger than the short term links and always have been.

These movements over monthly, quarterly and yearly periods are driven more by economic and company fundamentals and rather than by short term reactions to daily news and events, which drive the links in respect of daily and weekly movements.

Long term returns

Despite very little in the way of direct trade or investment links between Australia and the US at any time in our joint histories (apart from very brief periods during the latter part of the Second World War and during the Korean War), returns from the Australian and US stock markets have followed very similar paths over time.

In both Australia and the US, the economies and societies are based on the rule of law, enforcement of private property rights, separation of powers between the legislature, executive and judiciary, strong government control over the military, and strong public institutions – all of which are features largely inherited from Britain as the ex-colonial master to both countries.

Both economies began as agricultural societies, saw the rapid growth of manufacturing starting in the late 19th century and early 20th then accelerating in the middle of the 20th century, and both are now dominated by service industries. Both are relatively closed economies with relatively low reliance on external trade (despite our recent mining “boom” here).

In both Australia and the US, governments have come to be very significant parts of the overall economies over the past century. In Australia it has been focused on safety nets, protection of industries and state control of significant parts of the economy, whereas the US generally has had less protection, fewer safety nets and less government interference in industries and markets, with the difference being made up by much greater military spending in the US.

Both economies have experienced economic growth rates averaging a little over 3% per year in real terms since 1900, but the sources of growth have been quite different. Most of the growth in Australia’s total economy has been from population growth - ie just more people producing goods & services here, whereas most of the growth in the US economy has been from productivity growth - people producing and earning more *per person*, which leads to higher living standards. (Australia’s population growth has averaged 1.6% pa since 1900, compared to 1.3% pa for the US, while GDP per capita growth has averaged 1.9% pa in the US compared to 1.7% pa for Australia).

Australia has also had higher inflation rates than the US for a variety of structural reasons - consumer price inflation has averaged 4.0% pa since 1900 in Australia compared to 3.0% for the US. Both countries went through very similar global inflation and disinflation cycles that affected all developed economies in the 20th century: – rising inflation between 1900 and 1920-21, falling inflation through to 1945-6, then rising inflation up till 1980, and then falling inflation since the early 1980s (although Australia only tackled inflation in earnest from the early 1990s).

There have been two critical differences between the Australian and US stock markets – industry mix and foreign ownership. The Australian market has always been dominated by mining and banking stocks. In contrast, the US market has been dominated by industrials, supplemented by infrastructure (eg railways) and insurance stocks, with large national banks being only a relatively recent phenomenon.

US banking regulations prevented the development of large interstate banks until the 1980s & 1990s, and mining has never constituted a large part of the US economy or US exports (even during the 1850s Californian gold rush).

Despite the re-emergence of Asia in recent decades, the US still leads the world in technology and innovation. Much of the low value manufacturing is now done in cheap labour countries but US companies dominate the high value added parts of the value chain (including innovation, creativity, design, project management, finance, marketing, advertising, logistics management, etc).

As a result the US stock market is peppered with global brand name companies in numerous industries – including Apple, Microsoft, IBM, Google, Oracle, Intel, Cisco, Hewlett-Packard, Amazon, Honeywell, Texas Instruments, eBay, Dell, Exxon, Chevron, American Express, Visa, General Electric, 3M, Caterpillar, Ford, Boeing, DuPont, General Dynamics, Lockheed, Xerox, Johnson & Johnson, Pfizer, Merck, Bristol-Myers, Eli Lilly, Proctor & Gamble, Coca-Cola, Philip Morris, Altria (Marlboro cigarettes), McDonalds, Yum Brands (Taco Bell, KFC, Pizza Hut), PepsiCo, Kraft Foods, Nike, Colgate Palmolive, Kimberly-Clarke, Starbucks, Kellogg, Wal-Mart, Costco, Wal Disney, Time Warner, and dozens of other household name companies that dominate their respective sectors of global markets.

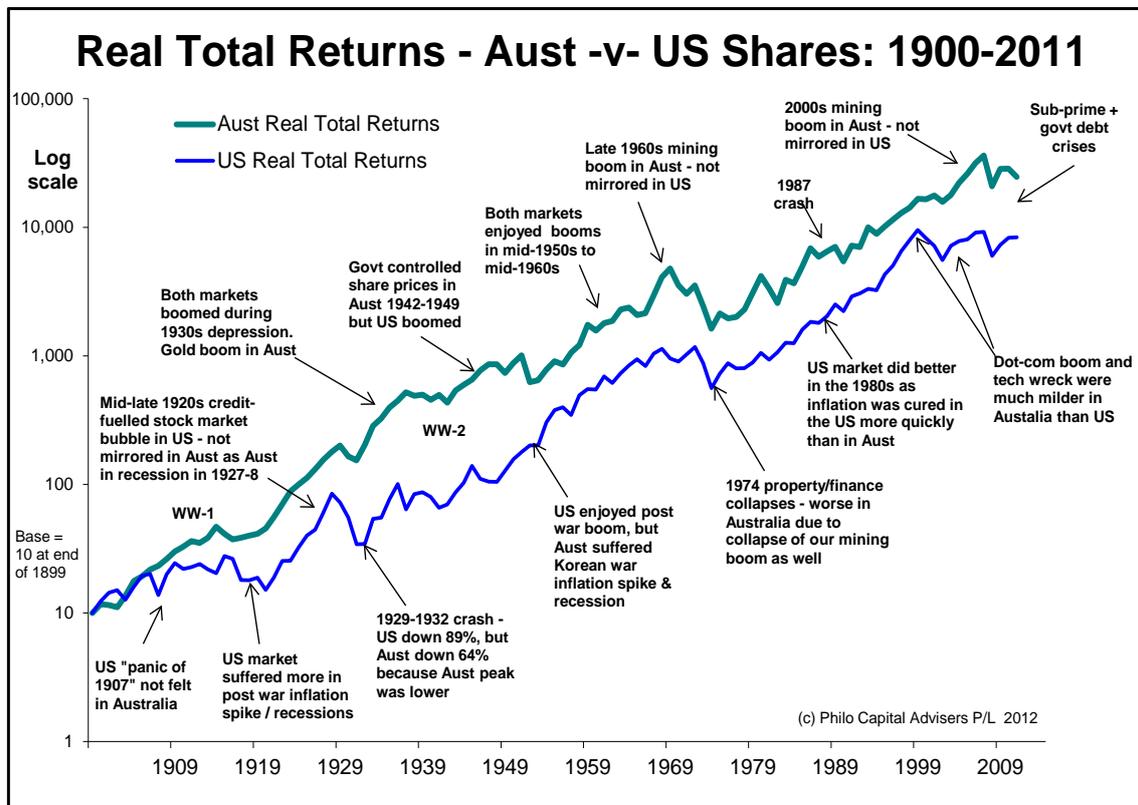
Australia has four giant coseted, protected banks, and it also has hundreds of rock diggers that have a good run in mining booms about every 30 years or so. Australia did build a few industrial companies behind protection barriers erected after the First World War, but virtually all have now been sold off, closed or survive only with government protection. Unlike in the US, virtually every industry in Australia, across the primary, secondary and tertiary sectors is dominated by oligopolies and this industry structure limits competition, stifles innovation, hampers productivity growth and entrenches inflation.

The second key difference is in the ownership of shares. Australia is a much younger nation, built by foreigners, funded with foreign capital, and has had 300 years less time than the US to develop local savings pools large enough to finance investment in companies and infrastructure. The Australian stock market has always been heavily reliant on foreign capital (primarily from the UK for most of its history, but more recently from American, European and Asian investors).

These two key differences (domination by a couple of industries and heavy reliance on foreign capital) have made the Australian market very sensitive to developments in global capital markets, both on the upside and the downside. On the upside, the Australian stock market has always been viewed as a high risk, commodities-based “emerging market” that is fuelled by “hot money” that creates wild speculative booms followed by devastating crashes when the hot money races for the exits.

Hot money pulled out of the Australian market by British investors in the early 1890s turned what was a domestic property downturn into a deep depression and severe stock market collapse and full-scale banking collapse in Australia in the 1890s. Similarly, rapid closure of the London market to Australian borrowers (on that occasion it was excessive government debt that was the problem), turned the late 1920s domestic recession into the deep 1930s depression, severe stock market collapse and banking crisis here. Likewise, the rapid withdrawal of foreign capital in 2008 helped turn what was a mild slow-down here into a severe stock market collapse as bad the US and other countries more directly affected, despite Australia having neither a property collapse nor a government debt crisis domestically.

The following chart shows total returns (ie including re-invested dividends) and real terms (ie after domestic CPI inflation) since 1900.



We can see that the paths of both stock markets have followed the twists and turns in all of the major global events and crises. Some booms were more pronounced in the US than in Australia (eg the 1920s automobile/radio/telephone boom, the Second World War boom, the 1950s boom, and the 1990s dot-com boom), while others were more pronounced in Australia (eg the 1930s gold mining boom, the late 1960s mining boom, and the 2000s mining boom).

Notice that all of Australia's booms have been mining booms, and that each collapsed spectacularly after a few short years when supply over-took demand, causing prices to plummet and hundreds of hastily thrown together mining floats to collapse and disappear.

Each of these booms in Australia and the US was followed by busts that were in proportion to the size of the preceding boom. Where a boom was bigger in the US than in Australia, the US market fell further than Australia in the subsequent bust, and the reverse was true with when the Australian boom was bigger.

The Australian market has generated real total returns (after inflation, and including re-invested dividends) averaging 7.2% pa since 1900, compared to the US returning 6.2% pa. This difference is entirely due to the poor relative performance of the US market in two distinct episodes:

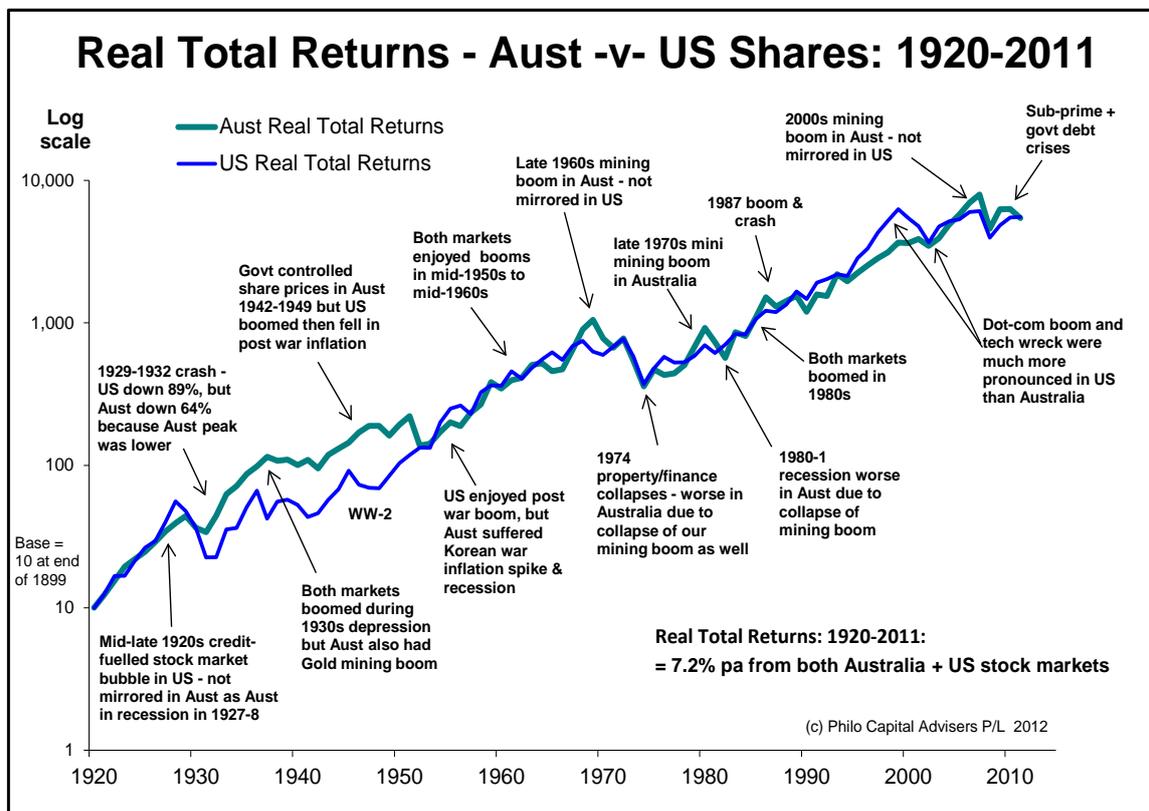
- The US market fell 50% in the "panic of 1907" which was not transmitted to Australia. The crisis involved a series of runs on banks following bank losses caused by the collapse of a debt-fuelled speculative bubble, led by the Knickerbocker trust. The problem was unique to the US with its system of thousands of tiny banks with little backing and no centralised lender-of-last-resort function, and also a series of large monopolistic investment trusts that dominated markets. The resultant banking crisis led to the creation of the Federal Reserve system in 1913. (Australia followed suit and created the Commonwealth Bank as Australia's central bank, as we

had experienced a similar devastating banking crisis in 1893 which prolonged the 1890s depression here).

- The US market also fell 50% during 1916-1920, while the Australian market rose moderately. The US market was hit by double-digit war-time and post-war inflation and rapidly rising long term bond yields and interest rates, culminating in the sharp 1920-1 recession. The Australian market didn't experience inflation until 1919 & 1920, and shares rose strongly during the period, despite the 1920 inflation spike and 1921 recession. The main factor that buoyed markets at that time was the rapid erection of protectionist barriers across the Australian economy.

Aside from these two brief periods of divergence, the two stock markets have followed very similar paths, where the only main differences in returns have been due to bigger booms in one country in which the relative gains were subsequently lost in bigger busts that followed those booms.

If we use 1920 as the starting point we see that the real total returns from both markets has been identical at 7.2% pa, with the only difference being the different degrees of boom and bust in each cycle.



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$$\sigma_p = \sqrt{(w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + w_C^2 \sigma_C^2 + 2w_A w_B \text{Cov}_{AB} + 2w_A w_C \text{Cov}_{AC} + 2w_B w_C \text{Cov}_{BC})}$$

$$(E(r_M) - r_f) \beta_i = \rho_{i,M} \frac{\sigma_i}{\sigma_M} \quad f(x_i) = e^{-((x_i - \mu)/\sigma)^2 / 2} \frac{1}{\sigma \sqrt{2\pi}} \sum_{n=1}^{\infty} \pi^n (x_i - \mu)^{2n-1}$$

CAPM: $E(r_i) = r_f + \beta_i (E(r_M) - r_f)$