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Secular Stagnation: Determinants and Consequences for Australia

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Larry Summers' re-use of the phrase appears justified in the present global economic climate since many factors contribute to comparatively poor OECD economic performance and weakening macroeconomic policy instruments. Some are measurement issues and others might be seen as the downsides of globalisation, which has integrated financial markets and redirected growth from the advanced toward the emerging economies. Yet measurable rates of return on investment do appear to be impaired by rises in perceived investment risks, institutionalised risk aversion, increased ageing and dependency, declining shares of government spending in public investment and R&D with rising shares of these directed to health, the retention of trade distortions, new concentration in industrial structure and a slower rate of human capital accumulation, not to mention an unexpected global abundance of fossil fuels and a slower Chinese economy. The information and literature supporting these concerns is reviewed and implications for global and Australian policy are inferred.

Keywords

Global stagnation, Technical change, Returns and risk, Public investment, Ageing

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Secular Stagnation at the Global Level: A Survey of Determinants and Consequences for Australia

Abstract

Larry Summers' re-use of the phrase appears justified in the present global economic climate since many factors contribute to comparatively poor OECD economic performance and weakening macroeconomic policy instruments. Some are measurement issues and others might be seen as the downsides of globalisation, which has integrated financial markets and redirected growth from the advanced toward the emerging economies. Yet measurable rates of return on investment do appear to be impaired by rises in perceived investment risks, institutionalised risk aversion, increased ageing and dependency, declining shares of government spending in public investment and R&D with rising shares of these directed to health, the retention of trade distortions, new concentration in industrial structure and a slower rate of human capital accumulation, not to mention an unexpected global abundance of fossil fuels and a slower Chinese economy. The information and literature supporting these concerns is reviewed and implications for global and Australian policy are inferred.

1. Introduction

There is rising concern in international fora about three trends in global economic performance. First, and most notably, there are declining trends in the rates of growth in economic activity (GDP levels) and, more broadly, national incomes, in OECD and middle income economies, most notably since the GFC.¹ Second, and according to Piketty (2014) most prominently in the Anglo economies, there is a trend toward the capture of what new income and wealth is generated entirely by high level professional and capital-owning households. The third issue is characterised by Summers (2014a) as a revival of secular stagnation, a phrase applied to the ultimately erroneous anticipation of a sluggish response by the US economy in the aftermath of the Great Depression (Hansen 1938).² While it is closely related to the previous two, secular stagnation primarily concerns declining real economic investment in the OECD, which is coincident with declining official interest rates and, so it is commonly thought, declining risk-adjusted yields on private debt and equity. These are considered problematic for two reasons. On the one hand they suppress incentives to enhance productivity, and therefore real income, via private investment. On the other,

¹ Lest readers be distracted by the thought of growth as synonymous with resource depletion, what is intended here is growth in the average *standard of living*. This depends on innovation and efficiency far more than it does on resource use. Such growth allows the quality of life of the poor and working class the prospect of elevation to the middle class levels.

² Other populist concerns about recent trends include rising global temperatures and environmental contamination, but these are not the focus here.

official rates near or below zero weaken the power of monetary policy to stabilise open economies (Summers 2016a).

The literature on all three of the above issues is growing rapidly.³ One prominent explanation for the stagnation of investment and growth in the US is technology pessimism. Gordon (2014, 2015) suggests that, by comparison with the great advances in living standards seen in the pre-WWII period and until the millennium, in the present and near future, real gains from technical progress are slowing while inequality is rising, education levels have plateaued and populations are ageing. At the same time the power of macroeconomic policy to stimulate and stabilise has arguably been depleted. The fiscal branch of that policy kitbag lost its power in this role with the financial openness that followed the demise of the Bretton-Woods system, the rise of sovereign debt during the past two decades and the simultaneous introduction of independent, inflation-targeting central banking. Monetary policy became the national stabilizer, yet its effectiveness too has declined in the past decade as borrowing rates have approached zero or fallen below it.⁴

Beyond this, however, the secular stagnation narrative has a political dimension in that it sees weakening governance in the OECD democracies and the need for more activist policy reform and public investment, even if this is to be financed by further sovereign debt (Backhouse and Boianovsky 2015, 2016, Summers 2014b, 2016c).⁵ Increasingly, the larger OECD democracies are said to be failing to finance upgrades to their public infrastructure, reform distortionary trade and other policies and enforce competition. It is also arguable that these democracies have failed to continue investing in non-health R&D, to reform education systems that undersupply human capital, and to regulate labour markets to control dependency by allowing retirement and pension ages to increase with life expectancy. Beyond these perspectives on government performance, there are also recent negative global shocks that have not been widely anticipated. Of particular significance there is the recent

³ The most recent surge of interest in secular stagnation arose out of the US blogosphere, in discussions between Larry Summers, Ben Bernanke and others, with those initial thoughts formalised in Summers (2014), Eichengreen (2014), Gordon (2014) and Krugman (2014). Their application to the European economies is reviewed by Pichelmann (2015). Pichelmann also addresses the simultaneous expansion of the literature on income concentration which was led by Piketty (2014, 2015). A more recent survey of the secular stagnation literature is offered by Arsov and Ravimohan (2016).

⁴ This development has spawned a growing literature on low-rate macroeconomics. See, for example, Bacchetta et al. (2015), Arias et al. (2016), Caldara et al. (2016) and Nassr et al. (2016).

⁵ Indeed, Summers (2014b) offers simulations that support the controversial idea that a temporary fiscal expansion would reduce the US sovereign debt to GDP ratio. We return to this issue in Section 5.1.

slowdown in the Chinese economy and, following considerable OECD investment in alternative energy technologies, a surprising new abundance of fossil fuels.

These predominantly pessimistic outlooks notwithstanding, there are also more optimistic narratives. Fund manager Nangle (2016) argues that the global labour “glut”, that followed the demise of the Comecon system and saw the opening of populous developing regions to global commerce, will be reversed in the 2020s. This will leave labour power scarce again, unwinding recent changes in economic structure and behaviour while constraining inequality. This view is countered by other contrarians whose outlook is dominated by the impending “fourth industrial revolution” which is seeing major cost savings achieved through intelligent automation, albeit at the potential cost of further inequality (Brynjolfsson and Andrew 2011, OECD 2012, Tyers and Zhou 2016).

This survey is focused on the pessimistic outlook that underlies the core literature on global stagnation. It covers the many explanations for declining economic performance and it offers some of our own. At the same time, we cover areas of relevance that are slanted toward the perspective of small, open, and therefore internationally dependent, economies like Australia. The section to follow reviews the evidence to illustrate the slowdown in advanced economy real GDP growth, and the associated slowdown in investment growth. Section 3 offers a brief description of our own interpretation of the elemental macroeconomics of secular stagnation. Section 4 reviews the many explanations offered, and in some cases conceived by us, for the recent stagnation. The stories are many and they are intermingled with our own compilations of the superficial evidence in each case. Section 5 summarises policy implications in general, while Section 6 focusses the lessons for small open economies like Australia. Section 7 concludes.

2. The Slowdown

That there has been a slowdown in the real GDP growth performance of the advanced economies since the GFC, relative to fitted trends and forecasts, is not in doubt.⁶ In this section we re-examine the evidence for this, and review the superficial determinant, namely an associated slowdown in investment growth. We also examine the notion that global

⁶ See Summers (2016), IMF (2016), OECD (2016), Arsov and Ravimohan (2016) and Tuelings and Baldwin (2014). For comparisons of pre-GFC forecasts with post-GFC performance see, particularly, Pagana and Sbracia (2014), Lo and Rogoff (2015), Arsov and Ravimohan (2016), Crafts (2016), Eichengreen (2015) and Gome et al. (2016).

investment has slowed less than that in the advanced economies and that growth has merely been redirected to the developing world.

2.1 Slower Growth in the Advanced Economies

The particular shortfall in real GDP performance in the advanced economies since the GFC is illustrated in Figure 1. This is shown relative to trends fitted over the pre-GFC period. The shortfalls are most substantial for the US, Europe and Australia. The transition to a more stagnant economy had arrived in Japan much earlier and so its post-GFC comparative performance has fallen short of its “lost decades” experience to a lesser extent.⁷ Yet real GDP is a measure of economic activity rather than welfare and we might well ask how well these economies have performed in delivering quality of life. An economic measure nearer to this is real net national product per capita, which indicates the purchasing power of the income generated by the residents of those economies, net of depreciation, per resident, over locally available consumer products. Changes through time in this measure are also shown in Figure 1 and these, too, indicate declining growth. Interestingly, however, this decline in performance appears to have commenced in the early 1980s, and no particular change of trend is suggested beyond the GFC.

While these results appear to cast a gloomy picture for the advanced economies, the trend in real net national product per capita need not suggest issues requiring policy change. Much growth, historically, stems from the transition from rural to urban life and this transition has been virtually complete in the advanced economies for the past two decades.⁸ So the aggregate slowdown need not suggest retardation in the welfare of average, urban, middle class residents. A similar bias arises due to net immigration from outside. Since the 1980s the advanced economies as a group have become net destinations for immigrants. The contribution of net migration to population growth appears to have peaked in the period leading up to the GFC and to have remained high since, as suggested by the data for the European Union that is presented last in Figure 1. If these immigrants have been arriving from poorer countries their initial productivity can be expected to be lower than that of prior residents and so their arrivals might be expected to slow aggregate performance while not retarding the growth in welfare for any individual in these economies.

⁷ For reviews of the determinants of Japan’s earlier transition to slow growth, see Bayoumi (2001), Hayashi and Prescott (2002), Hoshi and Kashuap (2004), Horioka (2006), Hamada and Okada (2009) and Tyers (2012).

⁸ The OECD average urban proportion is now around 80% and the proportions in Australia, Japan, the UK and the US are higher. See World Bank (2016), *World Development Indicators*.

2.2 Declining Investment

Because international migration has ensured that the broad pattern across the OECD has been for continued population and labour force growth, explanations for the post-GFC real GDP growth slowdown must focus on capital growth and productivity. A slowdown in the net rate of accumulation of physical capital is evident from the first graph in Figure 2, over an extended period for Japan, but since 2008 for the other advanced economies shown. Australia's comparatively high rate of capital accumulation persisted beyond the GFC. It is an exception because of lags in mining investment during the boom, driven by China's growth surge following its accession to the WTO in 2002.⁹ Very recently, private investment in Australia has been declining and it is likely that it will join the pattern followed by the other advanced economies.

The reasons why a slowdown in real net investment expenditure, and hence in capital growth, are explanations for poorer performance extend beyond a simple slowdown in the accumulation of homogeneous physical capital. New investment embodies new and more productive technology and so larger rates of capital accumulation also imply faster productivity growth. The rate of productivity growth therefore depends on how rapidly the embodied technology is improving. Gordon (2014, 2015) leads the technology pessimists in this, offering the view that the major gains in capital-embodied productivity are in the past and that recent developments in artificial intelligence and automation have contributed little thus far. We will return to this debate in Section 4. For now, it is striking to note the stagnation of total factor productivity in the advanced economies, illustrated in the second graph in Figure 2. The stagnation dates back two decades in the case of Japan. For the other advanced economies, however, it dates from the immediate lead-up to the GFC. Since rates of net capital growth have declined the level of investment expenditure has contributed to this. However, the fact that net capital growth has remained positive, while total factor productivity growth has stagnated, suggests that embodied new technology has not been the source of measured productivity it once was.

Some insight concerning embodied technology can be gained from an examination of the composition of investment in key advanced economies. Figure 3 shows changes in investment composition since 1990 in the advanced economies. The new ICT is thought to

⁹ The new investment in Australia was not only in the mining sector, however, since the boom also triggered new growth in the demand for services. See Corden (2012) and Tyers and Walker (2016).

carry frontier technologies while housing supplies an essential service but little embodied frontier technology. In the US, ICT investment slowed after the bursting of the “tech bubble” at the end of the 1990s, bottoming out just before the GFC but surging again thereafter. US housing investment took the opposite path, surging in the lead-up to the GFC and declining thereafter. In Australia and Canada, the share of investment in ICT peaked at the turn of the millennium and has fallen continuously since. While housing investment in Canada does not seem to have cycled like that in the US, Australian housing investment has fluctuated in a similar though more muted fashion, also reviving after 2013. Critically for Australia, there has been no US-like, post-GFC resurgence of ICT investment, the original growth in which had, arguably, been essential to Australia’s productivity boom of the 1990s (Parham 2013).

To the extent that new advances raise expected rates of capital return, which are eventually reflected in market interest rates, the trend of bond yields over time is at least indicative of underlying technical change and its potential. Real bond yields have indeed declined since the 1980s, with the decline steepening in the post-GFC period. This is reflected in the real yields on 10-year government debt shown as the final graph in Figure 2, offering at least superficial support for technology pessimism and for Summers’ (2016a) concern for the power of monetary policy. Yet, beyond technical change, there are many explanations for the low investment and low yields on offer in the advanced economies. We discuss these in our brief review of the elemental macroeconomics in Section 3 and our more detailed survey of determinants in Section 4.

2.3 Is the Growth Elsewhere?

The 1990s saw a transition whereby the average rate of expansion in the developing and emerging market economies exceeded that in advanced economies, as indicated in the first graph in Figure 4. Today, as the growth rates of the advanced economies are trending slower, those of developing economies are at least three times higher. While the growth of many poorer economies is from a lower base, the timing of the transition demands explanation. A key trigger is the most recent round of globalisation, characterised particularly by rising financial openness. This has allowed savings in advanced economies to seek out investment opportunities in labour abundant poorer economies where, in some cases at least, the relative abundance of labour has allowed capital to offer higher yields.

So this narrative goes, saved funds in the advanced economies are redirected to poorer ones. Growth is hard-won in the advanced economies, depending as it does on movements in the

global technological frontier. In poorer economies, catch-up growth can be quicker and higher yielding. The associated changes in the advanced and developing economies' shares of global investment are indicated in the second graph in Figure 4. Capital growth and economic activity in advanced economies therefore slows, yet income to capital owners in those economies expands as such opportunities widen, since earnings abroad are now readily repatriated. Moreover, the slower domestic physical capital growth in the advanced economies also slows the growth in the marginal product of labour and hence in real wages. This suggests that not only does domestic growth slow in advanced economies, but there is also an increase in inequality (Piketty 2014).

Emerging economy growth and the Asia-led financial 'reversal'

That this financial globalisation did supply a trigger for growth surges, particularly in East and Southeast Asia, is unquestioned (MacDonald et al. 1993). What is less clear is whether the scale of this investment was large enough to explain the impairment of investment growth in the advanced economies. The consequences of expanded commerce with poorer economies for labour markets in advanced economies have been well researched,¹⁰ yet the associated interest in the effects of financial interdependence is more recent. A case in point is the economy of Japan, where there has been little if any net expansion of its domestic capital stock during its "lost decades" (Figure 2) while a substantial portion of its (mainly corporate) saving is directed abroad. Consequently, most of the earnings from Japan's most prominent companies now stem from production abroad and the home economy has experienced economic stagnation and increasing inequality (Tomioka and Tyers 2016).

The case of Japan notwithstanding, the bulk of the available evidence suggests a variation in the narrative. Once the East Asian growth surges were triggered, starting with Japan in the 1960s, Korea, Taiwan and Hong Kong in the 1970s, Southeast Asia in the 1980s and China from the 1990s, the new growth was associated with saving rates that were very high by international standards. As these economies grew, high East Asian saving began to match and eventually exceed East Asian investment. This Asian financial reversal then combined with substantial excess saving in petroleum exporting countries to reverse the overall financial deficit in the developing regions from the late 1990s onward, as indicated in the

¹⁰ The literature dates from the early 1990s. Recent contributions include those by Haskell et al. (2012), Harris and Robertson (2013) and Autor et al. (2013).

third graph in Figure 4.¹¹ This evidence suggests that, during the past decade, there have been sufficient financial inflows from the emerging economies to the advanced regions to nullify any claim that investment there has been constrained by financial globalisation.

Sustainability of the Asian financial reversal

The ‘reversal’ of Asian financial flows is sustainable only if high growth and high saving rates are sustained. Growth is already slowing in China and its ‘value chain’ partners in Asia, as well as in other emerging economies such as Brazil. The experience of Japan shows that, as their economies mature, their aggregate saving rates are likely to decline. This is driven in part by Japan’s comparatively rapid demographic contraction, which is now at the stage where growth in aged dependency dominates the decline in youth dependency. This stage is rapidly approaching for China and, even though its Asian partners have not had low-fertility policies, their demographic structures have been changing similarly as households have voluntarily reduced their fertility.¹²

A further break on the performance of emerging market economies is the rise in the levels of debt carried by non-financial corporations. This is documented by Caruana (2016), who shows extraordinary increases in the period since the GFC. For the emerging economies as a whole, since the GFC, non-financial corporate debt has risen from about half to 100 per cent of GDP. Median leverage ratios have risen from around half to near 90 per cent, with the strongest expansion since 2010. At the same time, the average rate of return on equity in the emerging economies has halved. Caruana offers three reasons why this expansion of debt is negative from a global standpoint. First, very high levels of debt place a drag on productivity growth, because it reflects the misallocation of labour toward comparatively inefficient firms and industries. Second, high leverage combined with declining profitability can precipitate downturns that are sudden. The inevitable deleveraging then exacerbates the declines in asset prices, so that corporate balance sheets are challenged. Third, where the debt is denominated in the currencies of advanced economies, sudden downturns can turn into capital flights that are accelerated by further feedback in the form of associated currency depreciations.

¹¹ Recent contributions to the extensive literature on Asian net saving include those by Arora et al. (2015), Tyers (2015a, 2016a, 2016b) and Golley et al. (2016). Indeed, it has been claimed that the net inflows to the US associated with the “Asian savings glut” were large enough to make the cost of capital too low, fostering irresponsible investment in the lead-up to the GFC (Bernanke 2011).

¹² The implications of the Chinese fertility contraction for its economic performance and its current account surplus are examined by Golley et al. (2016). The transition to a deficit is projected.

3. The Elemental Macroeconomics

In a nutshell, the stories surrounding secular stagnation concern the perception in the advanced economies of declining rates of return, their effects on new private, economic investment and on the power of macroeconomic stabilisation policies.¹³ There are some sound fundamental reasons for a trend toward declining rates of return, which include a historically high capital to labour ratio due to high rates of capital accumulation during the baby-boomer saving period in the advanced economies (Lee and Mason 2010, Gagnon et al. 2016) and the aforementioned excess Asian saving. Expectation formation that is laced with unusual pessimism and high perceived risk appears also to have played an important role. We return to the source of the yield decline in the following section.

In any year, the expectation that this declining trend in yields will continue can be characterised as a shock to expected, risk adjusted, net rates of return in two interconnected market diagrams. The first represents the global financial market, on which are traded (predominantly) long maturity assets with real yield, r , and the second representing the global market for money and other low-yielding liquid assets. This combination is offered in Figure 5. Given the predominance of long maturity assets in global portfolios, the opportunity cost of the money component of those portfolios is the nominal long maturity yield. If we then construct a demand curve for real money balances that is shifted left by contractions in income (transactions demand) and/or expected inflation and right by expansions in income and/or expected deflation, the real long yield then supplies the vertical axis price on both diagrams.

The left market, for long maturity assets, has conventional demand by economic investors, who create new capital at the expense of the collective financial portfolio, the opportunity cost for whom is therefore best approximated by the real long yield on that portfolio. They do this because they expect the risk-adjusted, net (of depreciation) yield on their new capital will exceed this opportunity cost. Their demand for funds is shifted to the right by their expectation over this risk-adjusted, net rate of return. The higher this is relative to the opportunity cost the greater will be the level of real, economic investment. The supply of funds into this market comes from savers who smooth real consumption. For them, if real current global GDP rises temporarily, their saving supply shifts right. If real global GDP

¹³ Economic investment is here distinguished from financial investment in that it requires addition to the capital stock rather than mere rebalances that result in the acquisition of existing assets.

falls relative to their perceived permanent income, it shifts left. Importantly, however, these smoothing savers form expectations over future real disposable income and if they perceive it as rising then, for a given yield on their collective portfolio, they will save less in the current period. If they are pessimistic about the future they will save more.¹⁴

Now impose a negative shock to the expected risk-adjusted, net rate of return, possibly due both to fundamental structural changes, new risk perceptions or to raw pessimism. This has no immediate effect on output but economic investors issue less debt or equity and so asset prices rise and long maturity yields fall, along with the volume of economic investment. This reduces the opportunity cost of holding money in the collective portfolio and there is a movement down the demand curve for real money balances. The real purchasing power of the money stock, $m_S = m_D$, then must also rise. Assume for the moment that the money multiplier, θ , remains constant, implying no change in the cash to deposit ratio of households and firms and no change in the reserve to deposit ratio by financial firms. At the lower opportunity cost, households and firms prefer to hold a stock of liquid assets with greater purchasing power. One possible resolution is that there is a rise in the value of money relative to goods, which are fixed in supply at this length of run. This implies a decline in the price level (a change in the exchange rate between money and goods that cheapens money in terms of goods). The alternative resolution is a policy-induced expansion in the monetary base. These alternatives can be represented as:

$$m_S^0 = \frac{\theta M_B^0(i_S^0)}{P_Y^0} \rightarrow m_S^1 = \frac{\theta M_B^0(i_S^0)}{P_Y^1 \downarrow} = \frac{\theta M_B^1(i_S \downarrow)}{P_Y^0}, \quad (1)$$

where the monetary base, M_B , depends on the nominal, short or policy yield i_S . The consequence is either a deflation or a monetary expansion, implying a decline in the nominal short yield. Since the deflation is usually the least preferred change in the price level, because nominal wage rigidity makes employment unattractive with declining output prices and because deflation weighs negatively on investment incentives, the most common outcome is monetary expansion.¹⁵ The consequences for the yield curve are declines in both

¹⁴ The standard treatment for the slope of the saving supply curve has a slight upward tilt, for the normal range of the intertemporal elasticity of substitution. There is some controversy over this in the current very low interest rate environment with growing numbers of semi-retired asset holders who depend on fixed income. These savers seek to cover expected retirement expenses and so are inclined to save more if yields fall.

¹⁵ This implies traditional Phillips curve behavior and, by contrast with much of the recent literature employing real business cycle and new Keynesian models, downward rigidity of wages and involuntary unemployment. See Bewley (1999) and Malley et al. (2005) for supporting evidence.

the short and the long maturity yields. This emerges, along with reduced real economic investment and, thence, slower growth.¹⁶

Should the pessimism shocks be more general than merely those affecting investment, the results are similarly directed but much worse. This can be seen from Figure 6. There we also have pessimism about future income motivating a rightward shift in saving and causing a larger decline in the real long maturity yield. Combined with this is included an expected deflation, which, for any given opportunity cost of money, raises real demand for it, thus shifting the demand for real money balances to the right. In this case the monetary expansion required is much larger.¹⁷ The effects are as in (1) but of larger magnitude. Moreover, if the money multiplier declines because of more risk-averse behaviour by financial institutions and households, the monetary expansion required is even larger still. Clearly, since the GFC, this offers at least a partial explanation as to why central banks have been forced to resort to *unconventional monetary policy* (UMP).¹⁸

Much of the concern expressed over this by Summers (2016a) and others has been due to the impact of the ‘suppressed’ yield curve on the power of central banks to stabilise economic performance about a natural growth path. Clearly, the policy response that resolves this problem must come from elsewhere. The most spoken-of policy solutions are also clearly seen from Figure 6. For any particular real portfolio long yield, additional borrowing by governments to finance additional expenditure reduces total global saving, shifting the saving supply curve back to the left and mitigating the decline in real long yields. If that additional expenditure is on public infrastructure or R&D, it also has the effect of raising the private rate of return on new physical capital, which shifts the investment demand curve back out to the right, further mitigating the decline in real yields. Moreover, these investments by governments also accelerate underlying real growth. It is therefore with good reason that there is emphasis in international fora on public investments in countries that have ‘fiscal

¹⁶ The tendency for yield curves to slope upward (the term premium) is driven by liquidity preference but, importantly, we see the short maturity market as segmented from the long maturity market by transaction costs and institutional alignments (Johnson et al. 2010). The consequence of this is that central banks and large domestic financial institutions trade at the short end while the financing of most private investment occurs primarily at the long end. Moreover, it is long instruments that are traded internationally, the yields on which depend on global saving and investment, crudely following trends in a Wicksellian (1898) natural rate of interest at the global level.

¹⁷ This is one justification for the considerable significance that is attached to inflation expectations in applied macroeconomics. The estimated trend in these expectations in the advanced economies has been downward, as concluded by Grishchenko et al. (2016).

¹⁸ The UMP implies that central banks become participants on the saving side of the left hand market for long maturity assets, while printing money to finance their trades. This just serves to make larger the saving supply shift and the associated decline in the real long yield.

space', combined with return-enhancing structural (including trade) reforms (Summers 2016c, Lagarde 2016).

4. Declining Investment Incentives in the Advanced Economies

Stories that might help explain slowing economic growth in advanced economies abound. Yet numerical studies that would enable their comparative assessment are rising from a low base. This section reviews the various “headwinds”, to use Gordon’s (2015) term, generally going beyond the recent literature while including the key elements referred to by it. Each subsection concerns a particular headwind to real, risk-adjusted, net rates of return, presenting relevant results from the literature and summarising the available empirical evidence.

4.1 Technology Pessimism

Whether the facts justify the “techno-optimism” that is pervasive in our media is questioned most strongly by Gordon (2014, 2015). He regards recent advances in information and communication technology as less important in raising the standard of living than the great discoveries of the 19th and 20th centuries. These included the internal combustion engine, revolutions in materials science, transmitted electricity, sanitation and such health advances as antibiotics. In his view, recent advances have not revolutionised business practices and lifestyles in the way earlier innovations did, contributing to recent economic stagnation. Moreover, he claims the widespread belief in the under-measurement of gains from the latest advances has been typical of periods of innovation and was also characteristic of the major gains delivered by older technologies.¹⁹ Gordon is not alone in these views, which are shared at least in part by Acemoglu et al. (2016), Clark (2016), Crafts (2016) and Friedman (2016). Indeed, there are contributions that emphasise the more destructive elements of the newer technologies, such as Davidow (2011).

On the other side of this debate are the techno-optimists who see immense potential for productivity and lifestyle improvements from artificial intelligence (AI) and robotics. Mokyr (2013), for example, argues that we are on the cusp of a new era of progress in innovation that will provide an unprecedented boost to productivity. Yet this literature also has a dark

¹⁹ There is, of course, more to Gordon’s voluminous work than this. He also gives great emphasis to US “headwinds” resisting investment in further growth-enhancing technology. These are demography, education, inequality and sovereign debt. See the summary in Gordon (2014).

side that is emphasised by many of its proponents, namely that it is likely to induce greater inequality, not only across income classes but also between regions. It is not simply that machines may replace human work, which has been the key mechanism for distributing income to the middle class for two centuries.²⁰ It is also that the ownership of new technologies, software and know-how is now highly concentrated across regions. Repairs and local support now tend to rely less on associated local industries and more on direct transactions with a few global centres of supply. As Ford (2016) suggests, the issue is not that we may no longer have “broad-based” innovation; it is that modern innovation may no longer procure broad-based prosperity. Households dependent for their incomes on work, once referred to as the “proletariat”, are now being referred to as the “precariat”, facing higher employment risk and stagnant prospects (Das 2016).

Capital returns may be raised by the new technology in well-connected places but not in others (Khanna 2016), and the globalisation of the financial market will deliver those returns to savers, while allowing physical capital stocks to erode in less well-connected places. Returns will no longer depend on the availability of labour, to be combined with physical capital, but rather, they will depend on technology property rights and skills, the holders of which will be increasingly attracted to connected cities and their hinterlands. A new geographic polarisation of the global pattern of economic activity may ensue. But investment and its global distribution depend on much more than the private technological frontier. They also depend on public infrastructure investment and, where innovations are non-excludable, government contributions to R&D. These topics are addressed in Section 4.5.

4.2 Transformed monetary policy and prudential regulation

As indicated in the previous sections, advanced economy bond markets have faced rising demand since the early 1990s, causing the negative trend in real yields shown in Figure 2 and the trends in long maturity nominal yields in Figure 7. This has been due, in the first instance, to the growth of Asian current account surpluses during the “great moderation” (Arora et al. 2015). Post-GFC, the Asian surpluses moderated but the transition to UMP saw advanced economy central banks become much larger players in these markets, encouraging private investors and stimulating a “bond bubble” (Krishnamurthy and Vissing-Jorgensen 2012, Maley 2016, Price 2016).

²⁰ This literature is large and growing as rapidly as the technology it describes. See, for example, Brynjolfsson and Andrew (2011), OECD (2012), Goos et al. (2014), Hemous and Olsen (2014), Avent (2016) and Tyers and Zhou (2016).

4.2.1 Consequences of UMP:

While Northern Hemisphere UMP has been (at least publicly) intended to expand employment and output, the extent of this and the channels through which it has acted remain unclear. Its role to date appears to have been to boost commercial bank liquidity and to reduce their portfolio risks. Central banks have printed money to purchase challenged assets or long bonds, sometimes through the agency, or from the portfolios, of commercial banks. The funds have then added to commercial bank deposits on central bank balance sheets, while commercial bank asset portfolios have shifted from challenged assets or long bonds in the direction of those deposits. As shown in Figure 8, this has greatly increased monetary bases in UMP economies but, at the same time, correspondingly decreased money multipliers, leaving the path of nominal currency supply comparatively smooth. The hoped-for boost out of deflation, and into target inflation ranges, has therefore fallen short.

Of course, UMP might be expansionary via the “credit channel” if the commercial banks had taken advantage of their increased liquidity and reduced these deposits, but this would also have boosted the money supply and contributed to inflation. This does not seem to have happened on a grand scale. A further channel that was highlighted early on by the US Fed was the redirection of private investment into equity markets. Clearly this has happened, the bond bubble notwithstanding. Crude rates of return on equities are indicated by the earnings/price ratios shown in Figure 7 for the US and Australia. These tended to follow the bond yields at least until 2000, after which, increased volatility notwithstanding, they appear to have stabilised. Despite this arbitrage, the investment evidence presented previously suggests that, even there, the majority of the rebalanced funds appear to have been chasing old assets, exacerbating asset price inflation. Moreover, the flight was not only to domestic equities but to investment abroad, which caused either inflation or nominal appreciations in non-UMP economies.²¹

The return to conventional monetary policy, starting in the US, is precarious not just because of the inevitable contraction in money aggregates and their possible deflationary effects, but because it will prick the bond bubble, shifting up the yield curve and reducing asset prices.

²¹ The aggregates for the non-UMP countries, Australia and China, shown in Figure 8, do not show the large changes associated with the advent of UMP in the US, Japan and Europe. If anything the changes are in the opposite direction, as tightening is adopted to control UMP externalities (Chen et al. 2014). In Australia, the monetary experience of the GFC is described in RBA (2009). The marked drop in the Australian multiplier in 2013 occurred in response to an increase in “exchange settlement balances” due to changes in the RBA’s management of the inter-bank market, possibly enhanced by commercial banks raising liquidity at the time of the “taper tantrum” (RBA 2014 and Aizenman et al. 2014).

The implications of this for the balance sheets of financial institutions will be of most concern. In the meantime, UMP has clearly suppressed yields on both bonds and equity and this can only have reduced optimism about future rates of return on new economic investment.

4.2.2 Prudential regulation and international banking:

In the lead-up to the GFC, easier credit in the advanced economies was exacerbated by differences across advanced economies in the tightness with which commercial bank capital requirements were enforced, and the extent to which foreign bank subsidiaries were covered by domestic prudential regulatory requirements. There was considerable “leakage” against these regulations, which softened lending conditions (Aiyar et al. 2012) and may even have contributed to the irresponsible lending in the US and UK that precipitated the GFC. Shin (2011a, b) notes large expansions in the balance sheets of key European banks in the decade post the EMU, their very substantial role in financial intermediation in the US market and the comparatively lax capital standards imposed on them by European regulators. In a more recent analysis, Bruno and Shin (2014) show that prudential policy and bank leverage in the presence of substantial bank-driven international financial flows continues to have significant implications for the cost of investment financing.

4.3 Perceived Investment Risks have Risen

The role of risk in investment decisions has been long understood following classic analysis by Keynes (1936) and Tobin (1958).²² A prominent 1990s foray is by Bernanke et al. (1999). The advent of the GFC raised the level of interest amongst macroeconomists in the fundamental roles of financial markets and risk.²³ The premium that separates government from corporate borrowing rates, for constant maturity, is one measure of the perceived riskiness of private investment. This has been on a rising trend for some decades, even while government rates have been declining (at least since the mid-1980s). These trends in nominal yields on government debt were indicated in Figure 7, and the sizes of corporate spreads are shown for the US and Australia in Figure 9. The spreads are important for explaining private investment behaviour since they render private funds considerably more expensive, risk

²² From Keynes (1936, p144) we have: “Two types of risk affect the volume of investment. The first is entrepreneur’s or borrower’s risk and arises out of doubts in his mind as to the probability of his earning prospective yield for which he hopes. [W]here a system of borrowing and lending exists a second type of risk is relevant which may [be called] the lender’s risk.”

²³ See, for example, Curdia and Woodford (2009), Gilchrist et al. (2009) and Meeks (2011), which find significant roles for risk shocks that permeate the economy via investment.

adjusted, belying the common implication that the rates motivating real investment have declined as rapidly as policy rates. Indeed, as Figure 7 shows, in the US at least, not only are corporate bond yields above government yields but also, and by more, are earnings to price ratios in equity markets.²⁴ Gilchrist and Zakrajsek (2012) decompose the corporate to government bond yield spread into components: a “distance to default” and an “excess bond premium” (the GZ spread), linking the latter to investment performance. Recent estimates of this measure are also shown in Figure 9.

This rising trend must be explained, along with the comparatively large step up following the GFC. Recalling that the elemental theory of investment sees risk premia proportional to the Arrow-Pratt coefficient of relative risk aversion and the variance of expected rates of return, widening spreads can either suggest higher variance of expected returns or increased risk aversion on the part of lenders and investors. A number of competing explanations arise.

4.3.1 Financial hysteresis:

With each negative financial shock there is a spike in corporate bond yield spreads that takes time to finally dissipate, even after product market quiescence is restored. We are still seeing the aftermath of the GFC, which was extraordinary in its financial gravity, and which greatly enhanced perceived private investment risks. That each successive crisis has led to a permanent upward shift in spreads is referred to as financial “hysteresis” (IMF 2014, Arsov and Ravimohan 2016, Amir-Ahmadi 2016). Apart from the significant step up following the GFC, this behavior is more clearly evident from the longer series of US spreads presented in Bernanke et al. (1999) and from the GZ spreads illustrated in Figure 9. A possible mechanism for this is that financial crises are infrequent, with yields appearing to have low variance in between, and so perceived risk, and therefore spreads, stabilise. This leads to agents underestimating variances until the crises arise, when the tails of the true distributions are exposed. Perceived risk is then updated and spreads are thenceforth permanently larger.²⁵

4.3.2 The demise of “sure things”:

In the advanced economies at least, for decades the two “sure things” about future demand have been population growth and urbanisation. These have made investments in housing, appliances, other consumer goods and urban infrastructure continuously profitable. Since the

²⁴ For the US at least, rates of return on existing private physical capital are even higher than the E/P ratios. These are estimated by Gome et al. (2011, 2015, 2016).

²⁵ A story similar to this is proposed by Bloom (2009).

advanced economies are now highly urbanised and they exhibit below-replacement fertility, it is tempting to conclude that expected rates of return from urban investment in these economies has declined, leaving investment returns to depend on far more risky determinants. But such an argument ignores immigration from the developing world to Europe, North America and Australasia, which has greatly increased in the last two decades, and continues to swell their urban populations. This is clearly demonstrated in the European and Australian cases in Figure 1. Except to the extent that new migrant populations bring greater investment riskiness because they have divergent behavioural norms, it cannot be claimed that population and urban growth slowdowns have “hollowed out” safe, high returning investments.

4.3.3 Lack of public infrastructure investment:

Outside the health sector we take the view that there has been a comparative slowdown in public infrastructure investment in the advanced economies, in part because of accumulating sovereign debt and in part because of more populist governance that resists new financing mechanisms. Such investment is seen by some as crowding out more productive private investment but we take the perspective of Collier and Venables (2016), and Venables (2011, 2015). It is their view that investments in public (predominantly non-rival and non-excludable) infrastructure require government participation and that project completions facilitate, and indeed stimulate, subsequent private investment.²⁶ In the advanced economies the shares of GDP devoted to such public infrastructure investment have declined in recent decades, curtailing the demand for private investments. We return to this issue in Section 4.4, below.

4.3.4 Demise of “efficient markets”:

The “efficient markets hypothesis” of Fama (1970) and others fostered the view that financial markets would perform best if regulatory efforts focussed on informing them fully and accurately. A downside of this approach has been excess volatility (Shiller 2003), stemming from resilient information asymmetries, financial frictions and credit constraints (Alfaro et al. 2016, Choi et al. 2016). Moreover, the rise of information technology has brought the “over-connection” problem, which leads to the triggering of panics even when initial disturbances are minor (Davidow 2011).

²⁶ This idea is supported by the finding of complementarity between public and private consumption in Australia by Brown and Wells (2008).

4.3.5 The comparative growth of “funds under management”:

We define *economic* investment as net addition to the private capital stock, by contrast with the financial definition which refers to portfolio management. The trend decline in economic investment may stem, in part, from the institutionalisation of saving and asset management. It is our hypothesis that, in the advanced economies at least, the proportion of the total stock of private holdings that is under institutional management has increased in recent decades. Some suggestion of this can be seen from Figure 10, which shows changes over time in the proportion of privately held US equities in mutual funds and trusts. Since 1980 this proportion has doubled, from about a third to about two thirds. Moreover, there has been a particular surge since the millennium, with the rising trend continuing. This is significant because, where individuals manage their own assets, heterogeneous risk preferences ensure there is investment in “green field” projects and venture capital. As more of the collective asset portfolio is “under management” by globalised financial companies, this heterogeneity has been replaced by more homogeneously risk-averse fund managers whose jobs depend on avoiding value volatility.

4.4 Lower fertility and greater longevity

Demographic change drives labour force growth, saving and therefore capital accumulation. Ultimately, it determines capital-labour ratios that, in turn, determine rates of return on investment. These are old issues, now well understood, but there are recent contributions that purport to explain declining economic performance in a low interest rate world. We first review the fundamental stories, then turn to the recent US literature and, finally, we consider the implications of advances in health technology and longevity.

4.4.1 The demographic transition and the “demographic dividend”

Fertility rates have been declining world-wide for decades. Those in Africa and the Middle East are declining from very high levels, while those in Europe and East Asia have been low for some time (Tyers and Shi, 2007). The initial decline from very high fertility has a dramatic lowering effect on youth dependency and so raises the employed share of the population (reduces the overall dependency ratio). This yields a “demographic dividend” (Bloom et al. 2002). Although much is often made of the economic benefits of reduced dependency, structural modelling estimates suggest they are modest (Golley and Tyers 2012). When fertility rates are already low and the age distribution has had time to shift toward the advanced age groups, further fertility decline causes smaller youth dependency effects and

these become more than offset by much larger rises in aged dependency (Lee and Mason 2010).

4.4.2 Baby-boomers and the second demographic transition in advanced economies

The post-war baby boom caused a surge in natural population increase in the advanced economies but the fertility of the resulting baby-boom generation proved to be comparatively low. Declining mortality and the drop in fertility resulted in a second demographic transition in those economies. This saw decades of falling dependency ratios, and hence, a second demographic dividend. Real per capita income was boosted, as was productivity, as the baby-boomers invested in both physical and human capital, raising their wealth in order to finance retirement income. With the entry of this generation into retirement, their prior saving has ensured historically high levels of capital per worker, even as they have begun to draw down on their wealth, reducing average saving rates.

The links between these demographic changes, economic performance and interest rates are given emphasis in a new macroeconomic literature (Authers 2016, Carvalho et al. 2016)). Several stories interact, with some tending to raise yields while others reduce them. On the saving side, the pre-retirement saving of the baby-boomers raises asset prices and suppresses yields. The combination of retirement and the associated wealth run-down, aided by increasing health expenditure during the final years of life, tends to reduce asset prices and raise yields. Meanwhile, in labour markets, the flip side of low dependency ratios during the baby-boomer employment period was that there were more workers competing for jobs, and hence downward pressure on wages and inflation. Lower inflation expectations then tend to reduce interest rates all along the yield curve, thus offering a countervailing force, and one that has been strengthened by migration flows into the advanced economies, as discussed previously. Rising asset prices and low wage growth then combined to increase economic inequality.

Gagnon et al. (2016) apply these ideas to an overlapping-generations (OLG) model of the US economy, showing that demographic factors are strong explanators of observed change. Aggregate labour supply, GDP growth and interest rates are shown to have risen as the baby-boomers reached working age in the 60s and the subsequent rise in the capital to labour ratio is quantified. With the retirement of this generation, growth rates of aggregate labour supply and GDP have slowed. The abundance of capital relative to labour is then a source of

declining investment returns. The authors see this as a long term development and question its association, by others, with short term shocks such as the GFC.

An alternative view of the likely future effects of demographic change is offered by Goodhart et al. (2015). They see the potential for an early reversal of the trends toward low real interest rates, declining wage growth and rising inequality. They see the decline in yields being arrested by a fall in saving that is greater than that in investment. They take the view that households will further dis-save in the future while investment will be sustained by the rise in nuclear families. Asset prices will decline while, at the same time, baby-boomer retirements will see upward pressure on wages and hence reduced inequality. Further pressure for capital growth would arise from the higher wages, fostering a continuation of the rising trend in the capital/labour ratio.

Tracey and Fels (2016) counter the optimism of Goodhart et al., demonstrating that people are retiring later in life and that the people who do the bulk of the saving retire the latest. A breakdown of the US labour force by income shows that participation by the top 20% after the age of 65 has increased dramatically in the past two decades, sustaining saving levels. Eventually, however, baby-boomer retirements will reduce average saving rates and run down asset stocks to fund retirement, raising real interest rates again. Goodhart et al. see this as delayed, not only by the continued employment of high-saving boomers, but also by high saving in the emerging economies. Strong demand for fixed income assets through 2025 is therefore expected to continue, along with low real interest rates. This reinforces the conclusion of Gagnon et al. that low interest rates and low growth performance will persist because, while net capital investment might decline, the US capital-labour ratio will remain high because the growth rate of the labour supply will also be low.

While this literature is US-focussed, it raises points that are relevant throughout the advanced economies, with application to Australia highlighted by the Treasury's (2010) *Intergenerational Report*. Yet all the works that focus on the retirement of the baby-boomers causing slower labour supply growth and rising real wages appear to neglect the high and rising rates of immigration from the developing world into the advanced economies, indicated in Figure 1.

4.4.3 Health technology and longevity

In the advanced economies and East Asia the economic effects of continuing declines in fertility are magnified by greater longevity, implying comparatively large rises in life

expectancy at retirement and more rapidly growing aged dependency – the opposite of the demographic dividend experienced in the developing world. This is associated in part with improvements in lifestyle and the quality of aged care, the latter emphasising personal care and so being comparatively costly, offering comparatively little opportunity for productivity gains from technology advances. It also stems from life-prolonging innovations in medical treatment and these, since they are at the cutting edge, come at a particularly high cost.

While longer lives must be considered welfare enhancing, the lack of political will to commensurately raise retirement or pension ages causes greater dependency and slower growth, at least as it is measured traditionally.²⁷ While much has been written on it, there is a dearth of comparative analysis at the global level that combines both the costs of dependency and those of new medical technologies. Moreover, we might ask whether overall (public and private) R&D efforts are shifting in the medical direction and, in particular, toward research on the prolonging of life beyond retirement. If so, it is possible that the intensity of broader R&D required to sustain more readily measured growth is waning.

4.5 Declining Public investment and R&D and the Rising Prominence of Health

For the OECD countries as a whole general government gross liabilities have risen as a share of GDP from 80% in 2008 to 111% in 2015.²⁸ Part of this is due to the failed over-application of fiscal expansions in the immediate wake of the GFC. In Europe and Japan, however, the rising trend in sovereign debt was strong from the 1990s, accelerated in Europe's case by the moral hazard that accompanied the extension of the European Monetary Union (EMU) to economies with already weak fiscal discipline. In Japan's, it was due to the idiosyncratic stagnation of its economy after the financial bust of the early 1990s.

The OECD countries are (officially) democracies whose governments have experienced rising pressures to extend their expenditures into areas once thought the responsibility of households, communities, charities and religious institutions. At the same time the politics of revenue expansion has become more difficult. Declines in the shares of government expenditure on public infrastructure are clear for the US and Australia in Figure 11. These have been continuous since the 1980s.

²⁷ A measurement issue arises here, in the sense that the lengthening of life adds only to the real per capita income denominator when, in reality, it is an addition to welfare and a contribution to growth more generally defined.

²⁸ See the OECD's *Economic Outlook* No. 95, database.

The relative scale of public infrastructure investment, and its composition, has also been affected by the rising aged dependency mentioned above. This has raised the transfer component of government expenditure and has made the health components of public infrastructure investment and R&D politically easier to prioritise. The resulting redistribution in the health direction is indicated, for the case of R&D expenditure, in Figure 12. The implication is that there has been a decline in the commitment of governments to expanding knowledge frontiers that affect returns on private investment in areas that directly foster growth. Since such investments are risky, and since governments are the major risk-bearing institutions, this has become a major performance headwind.

4.6 A Slowdown in Human Capital Accumulation

In the immediate post-WWII period, the East Asian economies, and to a lesser extent those of the former communist bloc in Eastern Europe, had political and cultural regimes that constrained many individuals from realising their full potential to accumulate human capital. Access to higher education was restricted for all but elite groups, with minimal opportunities available to rural households to find quality education and to work in the professions. The opening of markets in these countries to trade, foreign investment and foreign technology facilitated capital inflow to urban centres and the migration from rural areas that supplied the complementary labour and the eventual middle classes. The “quality” of the workforces in those economies therefore improved rapidly with openness to international commerce and international education.

In the OECD countries, these opportunities have been largely realised and so there now remain comparatively few individuals with the potential to significantly raise their human capital levels. This is indicated by educational attainment shares for the OECD as a whole, shown in Figure 13. They suggest a ceiling of just under half the population completing upper secondary education with the great majority of those now also completing tertiary qualifications. At the same time, education policies have become strongly influenced by vested interest groups whose often unstated focus is not necessarily aligned with the goal of student skill-enhancement. As a consequence, increased public education expenditures face lower rates of return in the advanced economies than they do in the emerging economies (Grigoli 2014).

4.7 Competition Policy

The tendency for invested funds to be directed increasingly toward existing large firms, combined with slowing productivity growth, could reflect a trend toward the distortion of markets by oligopolies in the advanced economies that partially explains the productivity slow-downs shown in Figure 2. According to Schumpeterian growth theory (Segerstrom et al. 1990), it is the competitive drive to reduce costs and the destruction of early-mover rents by following firms that links competitive behaviour with overall productivity growth (Aghion et al. 2013, 2015). Sustaining competitive behaviour requires constant surveillance against excessive market power. Partly in recognition of this, many governments liberalised trade policies, privatised state-owned enterprises, and removed protection to mandated monopolies in services during the 1980s and 90s. A primary motivation for these reforms, however, was financial globalisation and the need for competition-facilitating innovations that would enable their economies to compete for investment from an increasingly mobile pool of global saving. Nicoletti and Scarpetta (2003) argue that an observed increase in the dispersion of growth rates across OECD countries can be explained by cross-country variation of regulatory settings. Institutions, policies and ownership structures changed a lot as many countries implemented a wave of product market reforms aimed at improving competition and reducing the role of public enterprises. The main elements of product market reform were privatisation, liberalisation of potentially competitive markets, and pro-competitive regulation of natural monopolies. Privatisation affected virtually all OECD countries over this time, but to varying degrees; the largest reductions in public ownership took place in Portugal, New Zealand, Australia and the UK. In manufacturing, regulatory reform focused on administrative simplification and trade liberalisation, with most OECD countries implementing these by the end of the 1990s. The share of imports affected by non-tariff barriers declined in almost all countries, but particularly in Australia, New Zealand, the United States and some European countries.

Griffiths and Harrison (2004) also examine these reforms, focussing on the EU countries. These included deregulation and regulatory reform of network industries, reductions in state aid, tighter controls over competition and entry requirements, as well as the privatisation of public enterprises. Their results indicate that the level of economic rents was negatively associated with employment and investment and hence that greater competition is associated with stronger growth. Performance associated with these types of reforms in the advanced economies is also catalogued by the OECD (2007), suggesting that reforms were strongest in

countries where regulation was initially most constraining. Competition in product markets increased due to reforms of general competition laws, increasingly pro-competition regulatory policies and greater openness to foreign trade and investment.²⁹

The spread of this reform movement during the 80s and 90s beyond the advanced economies is documented, for India, by Panagariys (2004) and the IMF (2008) details the consequences for many developed and developing economies, pointing out that deregulations in the second half of the 1990s in telecommunications and electricity were facilitated by ICT innovations, which exposed public monopolies to competition. Across country groups, the advanced economies implemented reforms relatively early and achieved most in that period, while emerging market and developing economies are still catching up.³⁰

The policy impetus that drove these reforms has waned since the 2000s and crude evidence suggests that concentration has been on an increasing trend, as indicated by Figure 14. Efforts to induce competition and fight the output-restricting behaviour of oligopolies appear to have declined as governments in the advanced economies have confronted increased volatility and competition through trade with, and investment in, the emerging economies. This performance volatility interacts with oligopoly by limiting down-side adjustment. Hein (2016) sees the trend toward stagnation in the advanced economies as driven by cyclical consumption contractions that engender the absorption of losses as reductions in oligopoly rents, so that costs do not adjust downward with the exit of inefficient firms at the margin. Instead, rates of return on investment are doubly reduced, by excess saving on the one hand and reduced profitability on the other. Declining effort levels by governments to reduce oligopoly rents exacerbate this process.

4.8 The Unanticipated Relative Abundance of Fossil Fuels

Led by petroleum prices, all energy commodity prices rose sharply during the 2000s commodity boom. As indicated in Figure 15, they collapsed briefly due to the GFC but returned to historically high levels in the period 2010-2014.³¹ During this period the widespread expectation that energy would remain expensive led to major investments in shale

²⁹ For studies detailing Australia's 1980s-90s reform burst, see Productivity Commission (1996), Gruen and Shrestha (2000), Dolman (2009), Parham (2013), Mohommad et al. (2015) and Tyers (2015b).

³⁰ An exception to the wave of market-oriented reforms was Japan. The control of oligopoly rents remains an important issue there. See Asano and Tyers (2015).

³¹ Note that, due to constraints on porting and shipping capacity, combined with long term contracts between suppliers and electricity producers, the global market for natural gas has been less integrated than the others. The comparatively low Henry Hub prices stem from (temporary) export constraints from the US.

oil (mainly in the US) and natural gas production globally. This, combined with international commitments on carbon emissions, also led to substantial investments in alternative, “renewable”, energy technologies.³² Post-GFC, these investments were increasingly debt financed with the global level of energy debt reaching a sixth of US GDP by 2015 (Caruana 2016).

The 2014 collapse in energy and other commodity prices came as a surprise to investors. Much effort has been expended analysing its determinants, focussing on developments in production or consumption.³³ These include, on the demand side, China’s growth slowdown, and on the supply side, US shale oil investments, natural gas supply projects around the world, Iran’s return to petroleum exports and the reluctance of Saudi Arabia to accommodate by contracting its own production. Yet these explanations are only partial, with the price collapse showing elements of asset market behaviour, driven by expectation formation, futures trading and stock-holding (Domanski et al 2015).

Superficially, as a net importer of petroleum, the US must benefit from a cheaper import price in the long run. But financial markets have recently seen movements in oil prices as positively correlated with asset prices. Indeed, the recent appearance of a newly concordant OPEC induced a 15% rise in the oil price on talk alone. Rent extraction abroad appears to be welcomed if it restores the viability of significant exposures to energy investment.³⁴ Insight into this behaviour emerges from Caruana (2016), with further detail offered by Domanski (2015).

Debt issued by the world’s energy companies, many of which are state-owned, has grown more rapidly than non-energy private debt since the pre-GFC boom. This has been in response to the declining debt service costs discussed in Section 4.4, but also to the possibly misplaced relative confidence of lenders in the value of energy assets. As energy product

³² According to Cooke (2016), as of 2016, US carbon emissions are down 10 percent from 2005 levels, the US Government is reducing public funding for carbon-based power plants, wind power has tripled and solar power has increased 30 times over.

³³ See Baumeister and Killian (2015) for a review and analysis of the 2014 petroleum price decline.

³⁴ Yet the relationship between energy prices and economic performance may be yet more complex. Arora (2016) sees slow updating of industry classifications and input-output tables as missing new gains arising from higher energy prices that outweigh the consumer costs of high gasoline prices. In the recent deflationary environment, faster growth in oil and gas prices has even been seen as beneficial as an anti-deflation device, irrespective of the relative price consequences. It is also argued that strong growth in oil-producing countries such as Russia, Brazil and Venezuela, is beneficial to global economic performance while correspondingly strong growth in the Persian Gulf states raises global saving and therefore asset prices.

prices have fallen, the backing for this debt has declined. It is posited by Domanski et al. that the high level of indebtedness of the energy sector enhanced the 2014 fall in energy prices. Their argument is that the decline in the underlying asset values precipitated retrenchment, a sell-off of the assets backing the debt, driven by the need on the part of many indebted firms to deleverage. This enhanced the suddenness and magnitude of the price decline.

It is then apparent that the scale of energy investments has been large relative to overall investment in the advanced economies over the past decade, and the new relative abundance of fossil fuels has reduced expected rates of return. This has had a direct effect in reducing overall expected rates of return on investment, and an indirect effect that acts via the health of financial markets heavily exposed to energy related debt.

5. Generic Policy Implications

Exit strategies proposed for the advanced economies include both Keynesian demand management and reforms to bolster supply. In what follows we classify demand management as conventional monetary and fiscal policy, while supply side policies include those affecting labour markets, public infrastructure and R&D. In the latter we also include policies affecting demography (immigration) and participation rates (retirement or pension ages) even though these also affect demand. We use this taxonomy as an aid to sorting the recommendations emerging from the literature.

5.1 Demand management

This is given emphasis by Summers (2014a, 2014b, 2015), Blanchard et al. (2010), Blanchard et al. (2014), Koo (2014) and Krugman (2014), among others. Emerging proposals include the raising of inflation targets and continued unconventional monetary policy to reduce saving and enhance investment. Summers (2014a and b) recognises, however, that this could worsen financial volatility. He proposes raising investment in the advanced economies by increasing public investment, enhancing countercyclical fiscal policies and reducing the barriers to private investment. He also advocates pension and health insurance reforms as a means of stimulating private consumption spending, the redistribution of income toward lower income households who have a higher propensity to consume, and export promotion via trade agreements. Teulings and Baldwin (2014) suggest that the retirement age in funded pension systems be raised, in their case with the objective of reducing saving and so stimulating demand, rather than addressing changes in dependency. They also suggest the

deregulation of financial institutions in advanced economies, to widen the range of investments that can be financed, and the fostering of outward financial flows to emerging markets.

As indicated in Section 4.3, the contributions to the comparative stagnation of the advanced economies since the GFC of increasing perceived private investment risk, more risk-averse financial behaviour, and UMP appear to have been considerable. Yet policy conclusions relating to monetary policy and financial regulation are less focussed in the literature. One clear message is that crises widen risk spreads, which then take considerable time to re-adjust and, when they do, the spreads assume a path that is permanently higher than pre-crisis levels (Bloom 2009, Amir-Ahmadi 2015). While there have been extensive arguments over UMP in the US, Japan and Europe, considered research by Engen et al. (2015) indicates that the effects on expectations and perceived risk of the Fed's period of UMP are positive and still evolving. The level of monetary easing was more considerable than anticipated by the private sector, confirming that the Fed would be committed to a repeat performance should demand contract dramatically in the future.

5.1.1 Fiscal multipliers

This is a fraught literature with disagreements stemming from choices of model and empirical method. Conventional Keynesian training in macroeconomics and some recent expectations-driven “new Keynesian” models support large and positive responses to fiscal policy. Fiscal multipliers are frequently estimated to exceed unity, implying that proportional increases in real GDP emerge larger than the corresponding proportional increases in government spending. This is even to the point where spending increases cause GDP expansions that are sufficient to generate more government revenue than is required to cover the cost of the original stimulus, so that the sovereign debt to GDP ratio actually declines. For the US this is the finding of Summers (2014b), which is based on modelling at the US Fed by Engen et al. (2015), and of Eggertson et al. (2016). Muscatelli and Tirelli (2004) offer earlier modelling of the US economy that is more circumspect about the power of fiscal policy while nonetheless finding positive multipliers. Zubairy (2014) also models the US economy, finding the multiplier for government spending to be 1.07, which is largest on impact, falling to 0.72 after 20 quarters.

Amongst the many empirical studies, large positive fiscal multipliers are also the finding of the well-cited work by Blanchard and Perotti (2002). For the post-WWII US economy they

show that positive government spending shocks have positive effects on output, and positive tax shocks have negative effects, though their multipliers are less than unity. Auerbach and Gorodnichenki (2015), estimate fiscal multipliers for several OECD countries via an STVAR that distinguishes the responsiveness of the economy to fiscal policy in downturns from that in upturns, with estimated fiscal multipliers larger than unity in recessions and positive but smaller in expansions.

Our own scepticism toward the conclusion of high fiscal multipliers relates to the associated monetary policy regime. In economies with floating exchange rates, open financial markets and inflation-targeting regimes, the expansionary effects of fiscal expansions stem at least in part from the inflations they cause and these automatically trigger offsetting monetary contractions. Of course, this is only true while conventional monetary policy is effective, requiring that short yields be well above zero. Since the GFC this has not been the case in the advanced economies, raising the potential power of fiscal policy as the alternative stabiliser, notwithstanding high and growing levels of sovereign debt.

The most prominent contributions to the more sceptical literature do not make this point. They note that governments can only spend money that is first taken from the public, by debt or taxes, that public debt crowds out (usually comparatively growth-enhancing) private investment and that a rational public would recognise the eventual need for governments to settle increased debt by taxing more. The latter point, known as Ricardian equivalence (Barro 1979, 1981), is only weakly observed and it must be recognised that the prospect of increased government spending or reduced corporate taxation appears from the less sceptical literature to raise expected rates of return on private investment, even though it raises the cost of financing it. Nonetheless, Barro and Redlick (2009) focussing on the economic effects of defence spending in the post-WWII US, find that fiscal multipliers are less than unity though positive. When a proportion of the expanded spending is tax-financed, the multiplier is found to quickly descend into negativity. If true, these results negate the fiscal optimists' view that expansions can actually reduce the sovereign debt to GDP ratio.

Given the presumption that increasing government spending does crowd out growth-enhancing private investment, why is it that empirical studies so frequently come up with positive fiscal multipliers? Empirical studies face considerable difficulties, since 1) time series analyses crosses monetary policy epochs, going back to exchange rate and money supply targeting eras when fiscal policy is known to have been a more powerful stabiliser than it is today, 2) it is difficult to control properly for business cycle effects, which are

important since fiscal policy has been countercyclical, so that path of spending has followed that of unemployment and opposed that of output, and 3) fiscal expansions have variously taken the form of increased spending and reduced taxation, the effects of which on costs and exchange rates differ markedly. Further issues include the composition of government spending, the size of the fiscally active economy, its level of financial and trade openness and the existing sovereign debt burden.

Ilizetzi et al. (2013) consider these further issues in a sample of 44 advanced and developing economies and draw the following conclusions: 1) multipliers are larger in industrial than developing countries, 2) they are larger in economies operating under pre-determined exchange rates but zero in countries with flexible exchange rates, 3) they are smaller (and even negative) in open than in closed economies, and 4) those in high-debt economies are uniformly negative. Their estimate of the multiplier for the advanced economies with floating exchange rate regimes is 0.39 in the short run, rising to 0.66 in the long run. It is above unity only in the case of fixed exchange rate regimes, and then only in the long run.

5.1.2 The composition of government spending expansions and public investment

This is explored at the IMF by Spilimbergo et al. (2009). They emphasise that multipliers are country, time and circumstance specific. In supporting documents for the March 2009 G20 Ministerial Meeting, they list a range of multipliers. The low set included 0.3 on revenue, 0.5 on capital spending and 0.3 on other spending. The higher set included 0.6 on revenue, 1.8 on capital spending and 1.0 for other spending. Their “a rule of thumb” is a multiplier of 1.0 to 1.5 for large economies, 0.5-1.0 in medium sized economies, and 0.5 or less in small open economies. Smaller multipliers apply to transfers and larger ones to public investment spending.

The most common exit strategy offered in the secular stagnation literature is investment in public infrastructure (Summers 2016a, 2016b, 2016c, McKinsey and Co 2016). Considering that any of the advanced economies are fiscally constrained by high public debt and the risk of sharp rises in debt service costs, the proposal is to divide government accounts so that the management of the deficit between expenditure on goods, services and transfers and revenue, on the one hand, is separated from the public investment portfolio. For the latter, the government raises further debt from the public for projects with high rates of social and financial return. *If* these returns generate increased tax revenue then the additional debt is

readily serviced without raising tax rates.³⁵ Whether the returns can be extracted to service public debt, depends on the politics behind the tax system, as does the credibility of any government commitment to a *temporary* fiscal expansion (Summers 2014b).

5.1.3 Fiscal spill-overs

Auerbach and Gorodnichenki (2015) note that estimated fiscal multipliers between one large economy and others linked by trade and finance are not always positive but they can be at least as large as the effects of domestic fiscal expansions in those economies. According to Eggertson et al. (2016) and Bhattarai et al. (2016), such spill-overs are enlarged by the approach to zero interest rates in an integrated global financial market. This issue is addressed using a modelling approach by McKibbin and Stoeckel (2012) and McKibbin et al. (2014). They note the cross-country asymmetry of fiscal adjustments required when spill-overs are accounted for and show that there are strong linkages through financial flows, trade balances and the adjustment of exchange rates. One interpretation of their results is that fiscal expansions in advanced economies raise home activity but can have negative effects on the emerging economies.

5.2 Supply side stimulants

Gordon (2014) delineates the headwinds obstructing the continued growth of output in the US as including the demographic forces discussed in Section 4.4, the constraints to realising potential human capital levels discussed in Section 4.6, the role of inequality in diminishing the expectations, welfare and the spending power of the working class, and the expenditure constraining effects of sovereign debt. These engender a list of supply side policy recommendations, which include higher retirement and pension ages in line with life expectancy to reduce dependency and sovereign debt, expanded legal immigration, the legalisation of intoxicating drugs and the return of non-violent offenders from the prison system to the labour market. He also advocates higher education financing reform and a tax-financed health system accessible by the working class that would bolster the quality of both the labour force and life itself.

Structural and competition reforms are supported across the OECD by Barnes et al (2011). The most substantial gains are anticipated from regulatory reforms that would reduce

³⁵ This idea is also supported by McKibbin (2015) in the Australian context. It is also supported by Caballero and Farhi (2014) on the grounds that it will raise the supply of safe assets (government bonds) and so meet the recent yield-sapping rise in demand for them.

distortions by strengthening competition in product markets, cutting unemployment benefit replacement rates and reducing average tax wedges. Other reforms shown to yield substantial gains include increasing the quantity and quality of education, raising R&D subsidies, raising the retirement age and removing the implicit tax on continued work at older ages, and finally, increasing the shares of consumption and property taxes in total taxes.

6. Implications for Reform in Australia and other Small Open Economies

A key issue that separates the larger advanced economies from small open ones is international spill-overs. Significant reforms in the larger economies can either improve or harm the terms of trade facing the smaller ones and set off changes in financial flows that can either attract or repel investment in the short run (McKibbin et al. 2014). When these effects are positive the political imperative for domestic reform is weakened; when they are negative that imperative is strengthened. The effects of spill-overs can also be mixed. For example, a strong US recovery is positive for China's, and therefore Australia's, terms of trade but associated higher yields in the US could then diminish investment inflows in the short run.³⁶ Major changes in macroeconomic policy in the large economies tend to induce retaliation from other large economies, whereas such retaliation is a rare consideration for small economies. Australia's exchange rate is comparatively volatile, with variations that are tolerated internationally, by contrast with the US, where changes in monetary policy induce offsetting changes in Europe, Japan and China in attempts to avoid competition sapping appreciations.

6.1 Generic Small Open Economies

For small open economies whose monetary policy targets their inflation rates, the expansionary effects of government spending stimuli are offset by monetary tightening. Domestic short interest rates rise but the economy is too small to affect long rates, which depend on global saving supply and investment demand. Further, rising short rates cut investment in some small countries, like Australia, where housing debt is primarily of the variable rate type. Fiscal multipliers are therefore zero or negative, except where 1) monetary policy fails or is constrained and so cannot sustain the desired inflation rate, or 2) something about a prospective fiscal expansion raises expected rates of return on new private

³⁶ A strong recovery in the US that is associated with a rise in tariffs against Chinese goods would, of course, be less likely to have this positive effect.

investment.³⁷ This is consistent with the findings of Ilzetzi et al. (2013). It suggests that although decisive fiscal expansions may well shock large economies out of secular stagnation, it is unclear whether such expansions would serve this purpose in small open economies. The key implication of this is that, for small open economies like Australia, fiscal policy is not the solution. Instead, the policy focus for economists falls more naturally on an idiosyncratically appropriate subset of the suite of structural and competition reforms catalogued by Barnes et al. (2011).

6.2 The Australian Case

Australia offers the rare case of an advanced economy that is nonetheless dependent on global markets for both agricultural, mineral and energy commodities, is open to trade and financial flows and retains, even post-GFC, a functional inflation-targeting monetary policy regime (Wells 2003). Like the large advanced economies, it has suffered declines in GDP and NNP per capita growth performance, a (comparatively recent) decline in private investment and lower bond yields (Figures 1 and 2). By virtue of its traditionally high rate of immigration it suffers less from the demographic contractions in some parts of Europe and Japan. Nonetheless it is at one with these regions in facing the prospect of accelerating health costs associated with higher survival rates (Australian Treasury 2010 and Kurdna et al. 2016). During the past decade, Australia has become most dependent on exports to China and so its performance now depends on a Chinese economy that faces major growth headwinds (Golley et al. 2016). Now that its China-driven commodity boom has subsided and its economic performance is deteriorating there is much debate about the potential sources of continued growth (Gregory 2012, Garnaut 2013, Sheehan and Gregory 2013). Productivity-enhancing reforms are given emphasis by these economists, yet fiscal stimulus and public infrastructure investment loom large in the public debate as sources of potential recovery. We address the question of fiscal stimulus first.

6.2.1 Fiscal multipliers in the Australian context

The recent literature on Australian fiscal policy is, like that for the US, mixed in its messages. A focal point for debate has been the success or otherwise of the substantial fiscal expansion

³⁷ An exception to these generalisations arises when the inflation target is the rate of rise in the CPI and where the fiscal expansion, other things equal, appreciates the exchange rate. Because the CPI includes imports, this reduces the gap between the CPI and the producer or GDP price levels, which dictate employment. The CPI inflation targeting then implies monetary settings that cause relative inflation in producer/GDP prices, and this is expansionary. This effect operates for both small and large countries.

undertaken in response to the GFC. Li and Spencer (2016) use DSGE modelling to derive a cumulative fiscal multiplier that has a value of 0.90 on impact, rising to 1.26 after a year, assuming “accommodative” monetary policy. When monetary policy adheres to the inflation target the multiplier is found to start at 0.90 and decline to a mean level around 0.75. Importantly, they indicate that the estimated multipliers imply that the ensuing output recovery depends slightly more on the concurrent monetary easing than it does on the fiscal stimulus.

Andrew Leigh (2012) addresses whether the direct transfers that were part of the stimulus package actually raised demand (were consumed rather than saved). He draws evidence from household survey data and compares the results he obtains to the 2001 and 2008 tax rebates in the US. The Australian results give an aggregate marginal propensity to consume of 0.41 – 0.42, slightly larger than the US results which are in the range 0.35-0.38. This suggests that the proportion of the direct transfer that was saved was much larger than the average saving rate, but that the transfer did contribute somewhat to sustaining demand.

Results from a recent long run econometric analysis by Groenewold (2012) challenge the common assertion in Australia that fiscal policy was the main reason the economy avoided the worst effects of the GFC. He quantifies the relative importance of fiscal policy, monetary policy and foreign demand in mitigating the effects of the GFC using a structural VAR. The study advances the role of fiscal policy by extending over long periods of exchange rate and money supply targeting, but it emerges with the conclusion that fiscal policy has offered Australia only modest, if any, contributions to stabilisation, while strong performance during and after the GFC depended primarily on monetary policy (the floating exchange rate) and the resurgence of foreign demand soon after. Fiscal policy in Australia fairs even more poorly in the study by Makin and Narayan (2011), who focus on Ricardian equivalence effects, finding that changes in public saving have tended to be offset by opposing changes in private saving. Thus, the bulk of the Australian work on the recent effects of fiscal policy is supportive of the general conclusion by Ilzetzi et al. (2013). Conventional fiscal stimulus does not appear to offer a path to renewed expansion in Australia.³⁸

6.2.2 Supply side stimuli

³⁸ This is not to belittle fiscal policy in its other roles. Urdna et al. (2015) provide convincing evidence that ageing in the Australian context has very strong implications for the size and composition of Australian government spending in coming decades.

In response to the negative effects of slower Chinese growth, continued stagnation in Europe and Japan, and rising attractiveness of the US as an investment destination, Garnaut (2013) advocates major reforms to enhance productivity, which has languished in Australia since the beginning of the China-driven commodity boom (Figure 2). The downward trend in Australia's terms of trade and the rising yields available to investors outside the country will both serve to depreciate its real effective exchange rate. Continued inflation targeting will ensure that it also depreciates its nominal effective rate. Reforms that successfully reignite productivity growth will lower costs and therefore further depreciate both rates. As a small open economy, this is a strategy that is available to Australia without the risk of retaliation.

Protection remains a source of inefficiency, particularly as it affects oligopolistic industries in both manufacturing and services. According to Garnaut, there is considerable scope for reforms in Australia's services industries. Efficiency in electricity production has been impaired by incomplete privatisation, environmental regulation and, particularly, by reliability imposts on private companies that bear no association with true economic cost. The water sector remains heavily regulated, or supplied via state-owned systems, with marginal water-intensive agriculture being protected at considerable cost. Financial services and insurance has large barriers to entry and its rents have grown during the China boom. As in mining, while demand ran strongly during the boom, management focussed less on cost reduction. Transport is also constrained in efficiency by "public-private partnerships" wherein state governments underwrite private returns at levels linked to margins over the CPI. With a depreciating exchange rate the CPI inflates relative to the producer or GDP price levels, which better reflect changes in costs. These arrangements are therefore increasingly profitable for private partners but very costly to governments.

Beyond the highlights identified by Garnaut (2013) and the generic suite of reforms considered by Barnes et al. (2011), the most comprehensive list of productivity-enhancing Australian reforms is by Banks (2012). He sees "innovative" change within institutions as central and this has since become something of a political mantra. Less publicly prominent, however, is his view that Schumpeterian "creative destruction" is equally important (Aghion et al. 2015) which requires that there be competitive industries with relatively free entry and exit and hence government resistance to the trend, suggested by Figure 14, toward higher market concentration and oligopoly. It is important, then, that government policy reforms not only foster innovative behaviour within firms but also that they are pro-competitive.

The Banks list originates with Commission reports in response to a succession of government referrals. It begins with incentive reforms such as the removal of the remaining trade distortions, unproductive direct industry assistance and unduly restrictive licensing and self-regulation of professional services. It then moves to “capability” reforms that focus on the education sector, which address the quality of education services, and then to “innovation” reforms that enhance public R&D and make it more efficient. His “infrastructure” reforms focus on the efficient management of public utilities and of land transportation and his “human services” reforms address the delivery of aged and disability care, directing funding to individuals rather than caring institutions. In addition, he offers a long list of regulatory reforms that would unleash productivity constrained by such things as development approval processes, zoning controls and occupational licensing.

7. Conclusion

There are many determinants of declining economic performance in the advanced economies and the declines in key measures date back longer than the concerns labelled as secular stagnation by Summers and others. Global market integration, particularly since the demise of the Bretton Woods agreement in the early 1970s, is one clear contributor, since saving in the advanced economies has since been able to finance investment in low-wage economies, earning high rates of return in the form of dividends now readily returned to the wealthy in advanced economies. Meanwhile slower capital growth and embodied innovation at home slackens labour demand and real wage growth, raising inequality and sapping overall performance even while migration flows continue in their direction.

Gordon’s headwinds for the US, which include demographic change, poor average education performance, inequality and sovereign debt, are also long standing and are shared by most of the advanced economies. Yet the GFC has more recently highlighted financial headwinds. Successive financial shocks have tended to ratchet up the perceived riskiness of new economic investment, while at the same time an increasing share of saving in the advanced economies is joining funds under management and so being managed with increased aversion to risk. While reducing real private investment, this has greatly increased the demand for liquid, risk-free assets (namely money and short bonds) to supplement the collective portfolio and it has necessitated transformational increases in the balance sheets of central banks. The bond-buying needed to bring this about has, in turn, stimulated a “bond bubble”, reducing

yields on debt instruments all along the yield curve, with some instruments offering negative nominal yields. At the same time, declining risk-adjusted rates of return on private investment have fostered pessimism and deflationary expectations.

The transition to UMP by the central banks of advanced economies has met the increased demand for liquid assets while at the same time it has rebuilt commercial bank liquidity. Yet it has reduced the opportunity cost of holding money so much that it has not been very successful in restoring target levels of product price inflation. Indeed, it has accelerated relative asset price inflation ahead of what must be an eventual correction that could threaten balance sheets and precipitate a further financial crisis. Hence Summers' concern over the on-going power of monetary policy as a stabilizer. As Krugman indicates, a substantial positive shock is needed that will restore inflation expectations and put funds back to work. The impending, transformative political change in the US shows some potential to deliver a version of this at the time of writing. While a resurgence of inflation expectations in the US could soften the financial headwind, the long term retardants to economic performance in the advanced economies continue.

Governance in many advanced democracies is coping more poorly with the reform imperative than it did during the 1980s and 90s. Matching government funding demands for quality education, non-health R&D and public infrastructure with new revenue has become more difficult. While a resort to further fiscal expansion is advocated by some, the evidence in support of it is mixed, particularly for small, open, inflation-targeters like Australia. Yet the productivity-advancing reforms proposed by Banks, Garnaut and Barnes et al. are politically difficult because they address rents that engender interests in their retention, and these are politically stronger than the dispersed though larger community interest in their redistribution. Declining economic performance presents a challenge to governments, however, that will weigh more heavily against this resistance as the failure to deliver productivity leaves average households worse off, threatening political change.

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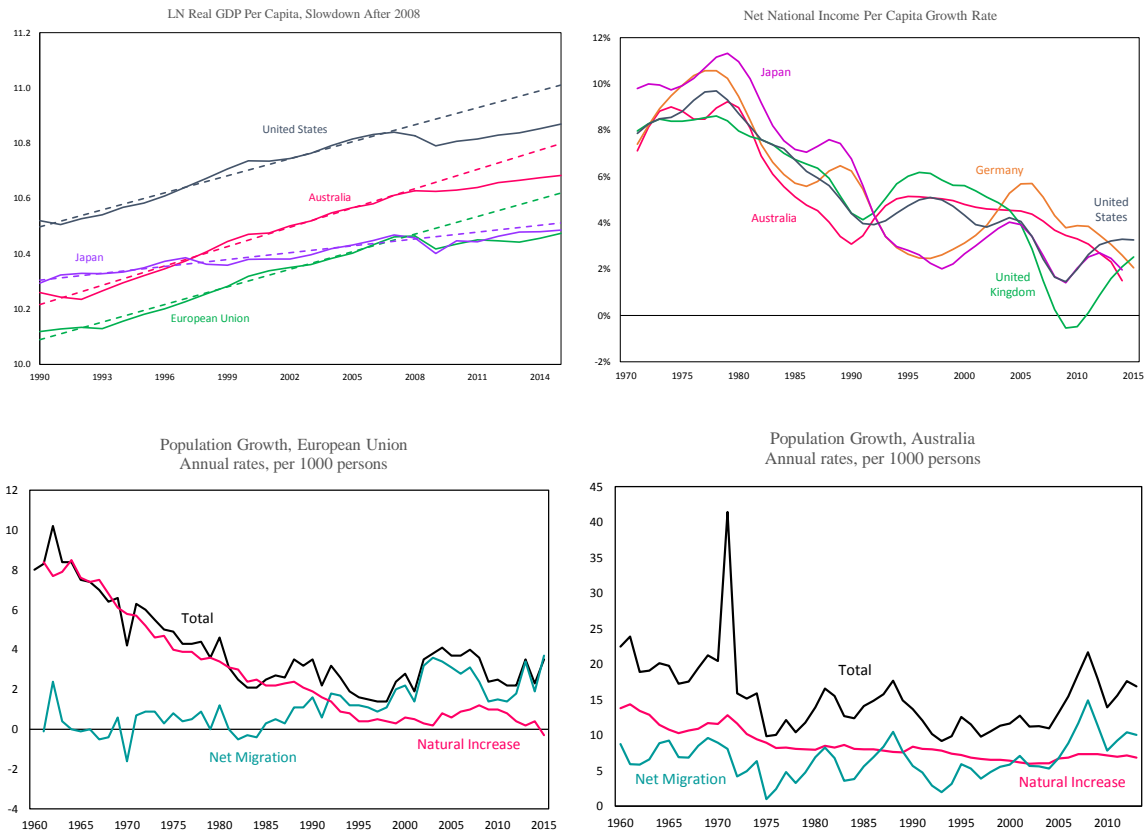
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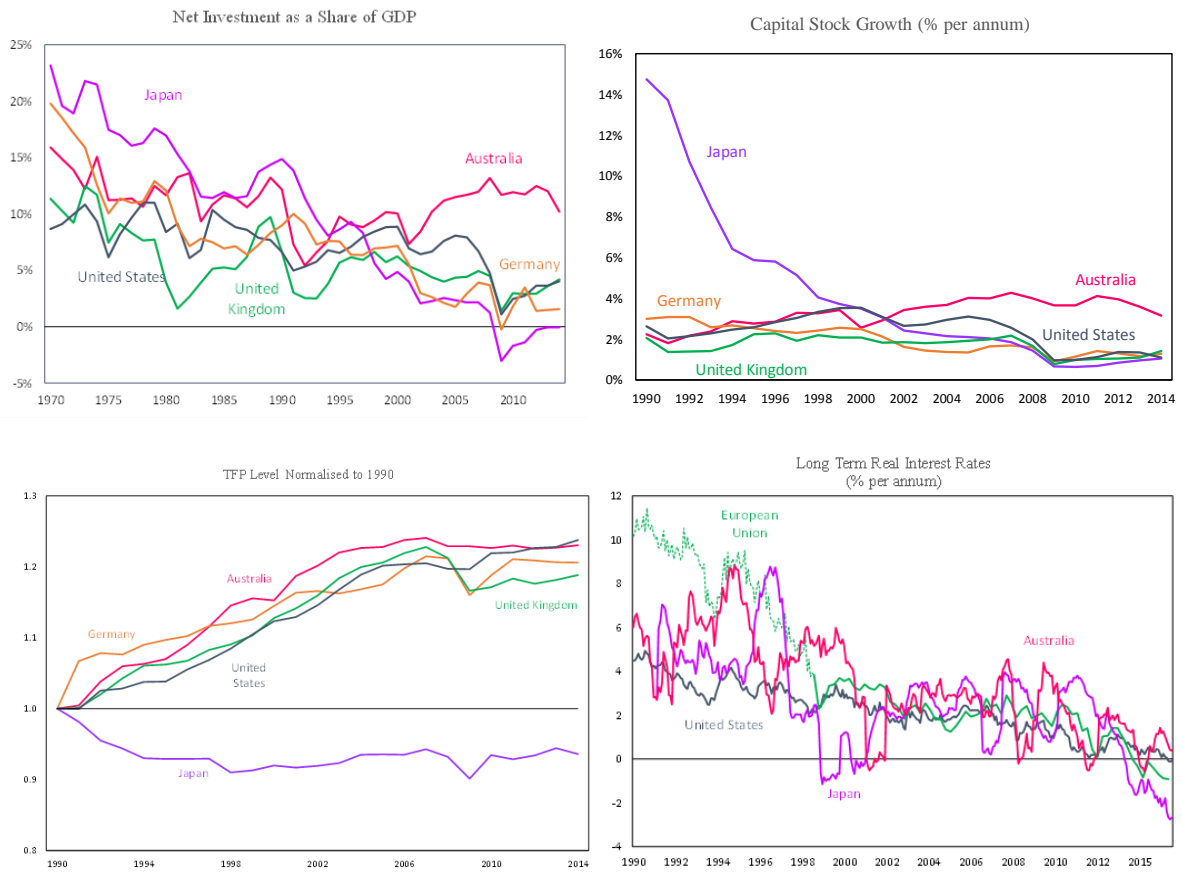
Figure 1: Output, Income and Population in the Advanced Economies



Notes: Real GDP per capita: the broken lines represent trend GDP growth between 1990 and 2008. Real net national income per capita: measured in USD per capita with trend growth rate established using a HP filter. Population growth rates are annual rates per 1000 people. The natural increase is the difference between the number of births and deaths over the calendar year. Net migration and a statistical adjustment are added to give the total increase in the population over the calendar year.

Sources: Real GDP per capita: World Bank, International Comparison Program Database. Real net national income per capita: OECD National Accounts Statistics. Population growth rates: OECD Employment and Labour Market Statistics. European Commission, Eurostat Population and Population Change Statistics.

Figure 2: Advanced Economy Capital Growth, Productivity and Interest Rates

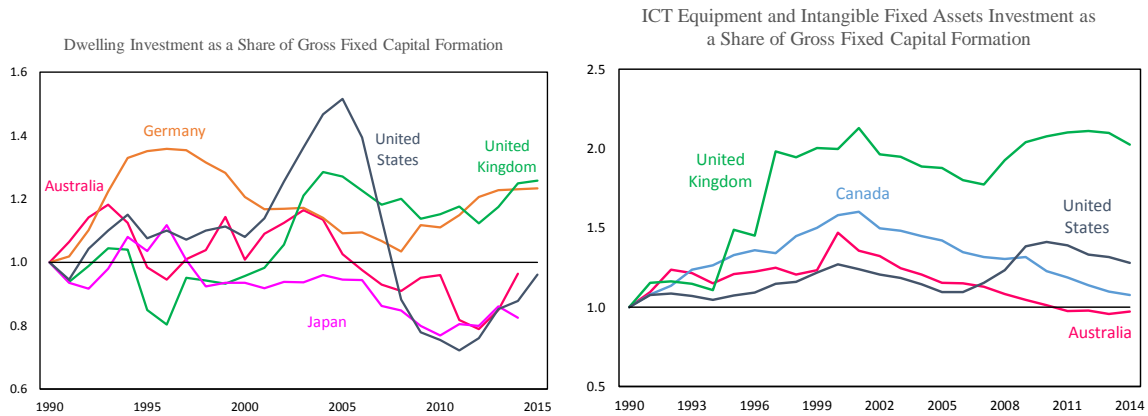


Notes: Net investment: gross capital formation, consumption of fixed capital and GDP all in constant 2010 USD. Long term real interest rates: 1. Europe pre-1998 uses Germany inflation rate one year prior as a proxy for expected inflation. Europe 1998-onwards uses 5-year expected inflation from the ECB survey of professional forecasters. 2. PPI one year prior is used to proxy Japan's expected inflation. 3. CPI one year prior is used to proxy Australia's expected inflation.

Sources: Net investment: World Bank World Development Indicators; capital stock growth and TFP levels: Penn World Tables 9.0. Long term real interest rates: 10-year bond yields: Federal Reserve, European Central Bank, Reserve Bank of Australia. Inflation and inflation expectations: Federal Reserve Bank of Cleveland, ECB survey of professional forecasters, Bundesbank, Bank of Japan, Reserve Bank of Australia.

Figure 3: The Composition of Investment

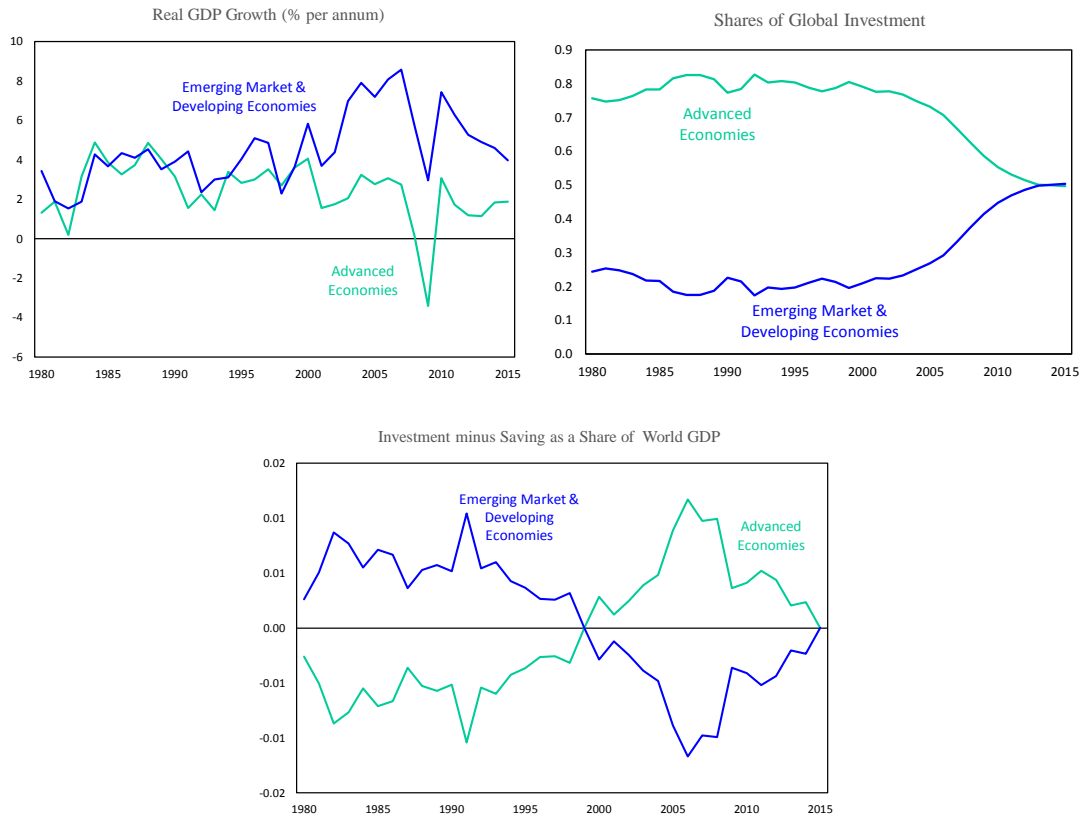
Share indices (1990=1.0)



Notes: These statistics divide gross fixed capital formation into six asset groups. “Dwellings” captures buildings and structures, but excludes land. Frontier investment is here an aggregate of “other machinery and equipment”, understood to include ICT equipment, and intangible fixed assets that include intellectual property R&D, software and databases. Categories not shown are “other buildings and structures”, which include assets such as roads, bridges, airfields and dams, as well as “transport equipment”, which includes ships, trains and aircraft.

Source: OECD National Accounts Statistics.

Figure 4: Growth and Investment in the Advanced and Developing Economies



Notes: World saving does not equal world investment in this data series. For the third graph an adjustment is made where the residual (world investment minus world saving) is added to Advanced Economies saving to achieve equality at the aggregate level. Saving is subtracted from investment within each group (advanced and developing economies) and the residual is expressed as a share of world GDP.

Source: IMF *World Economic Outlook Database*, October 2016.

Figure 5: Global Financial and Money Markets with Investment Shock

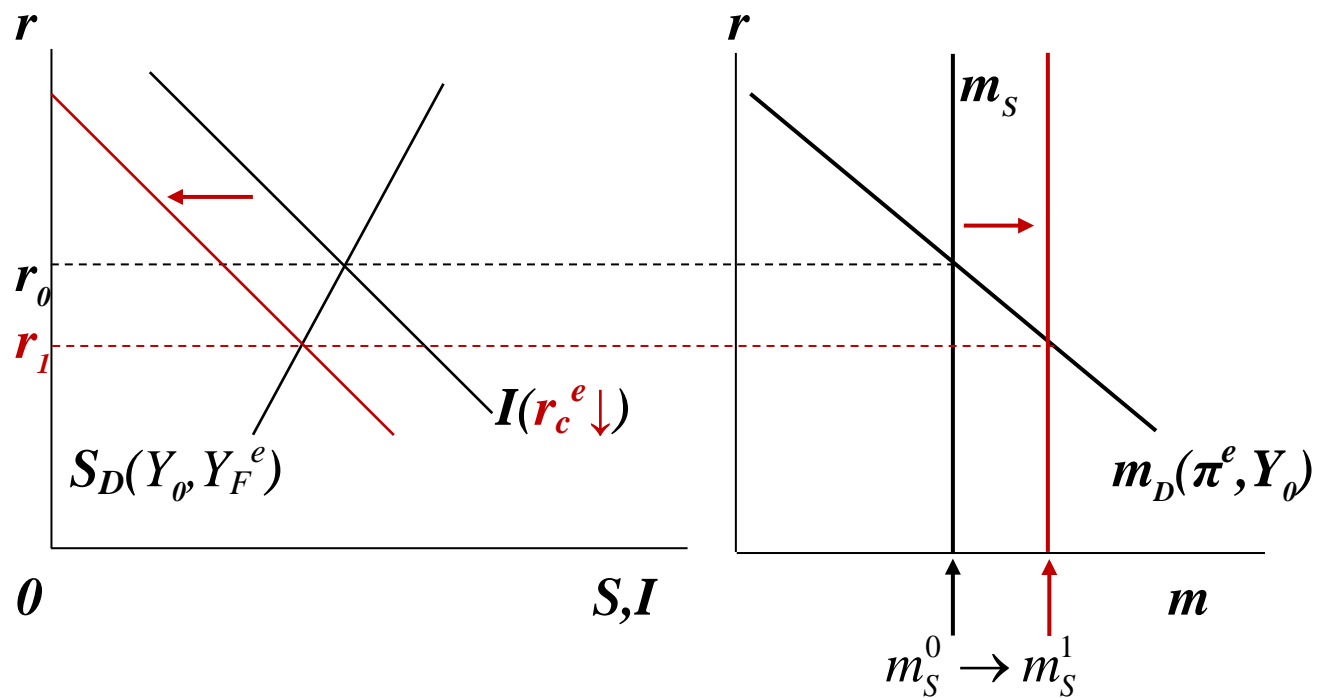


Figure 6: Global Financial and Money Markets with Investment and Pessimism Shocks

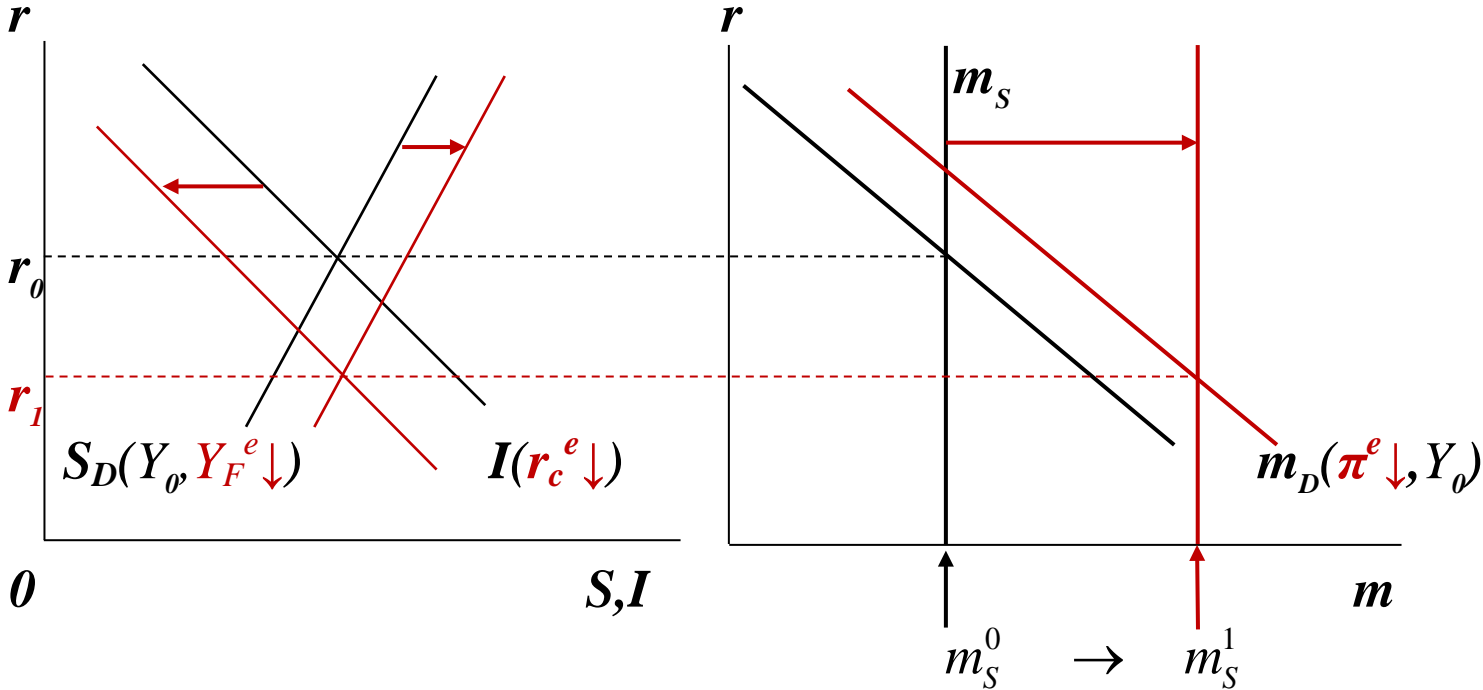
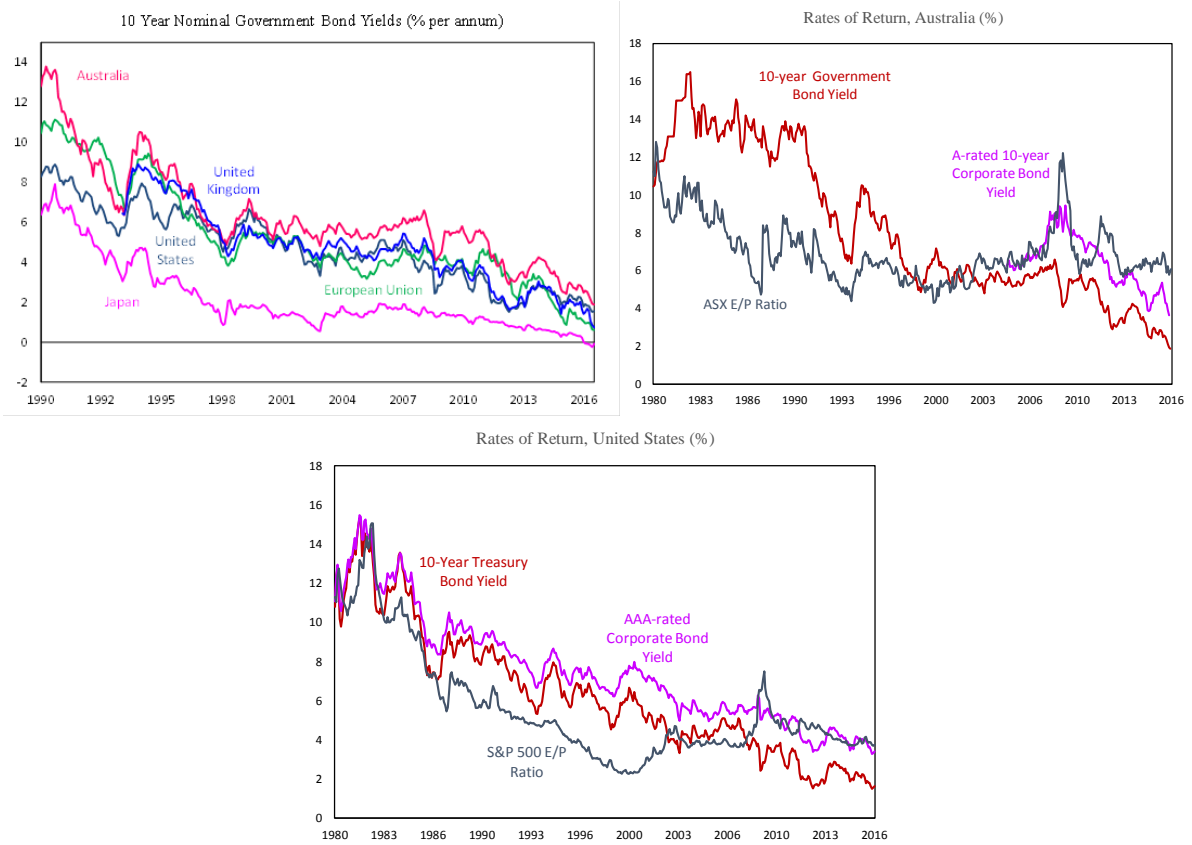
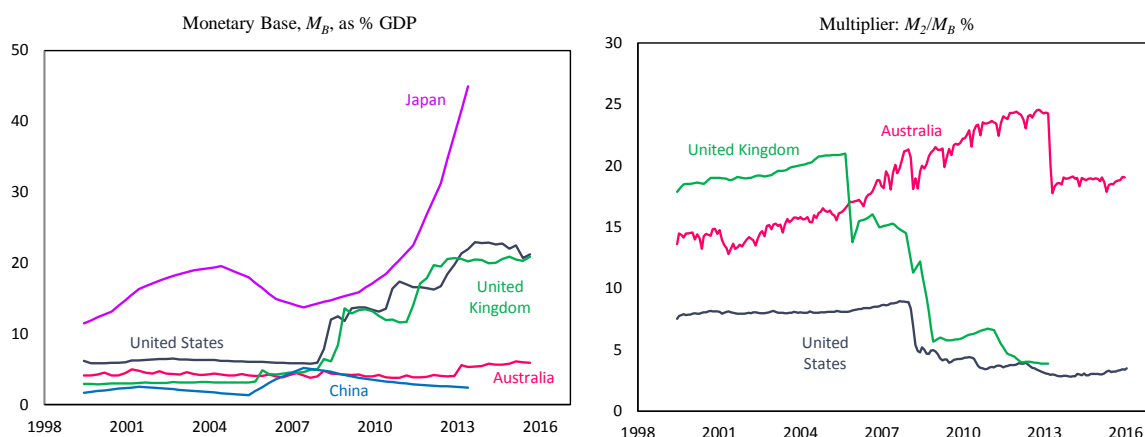


Figure 7: Yields and Capital Returns



Sources: US rate from FRB of St Louis (FRED), European rate from European Central Bank (sdw.ecb.europa.eu), Australian rate from the RBA (rba.gov.au/statistics), UK from Bank of England (bankofengland.co.uk/statistics), Japanese rate from ECB (sdw.ecb.europa.eu). The S&P 500 E/P ratio is based on the Shilling P/E from www.multpl.com. The ASX E/P ratio is obtained from Market Index.

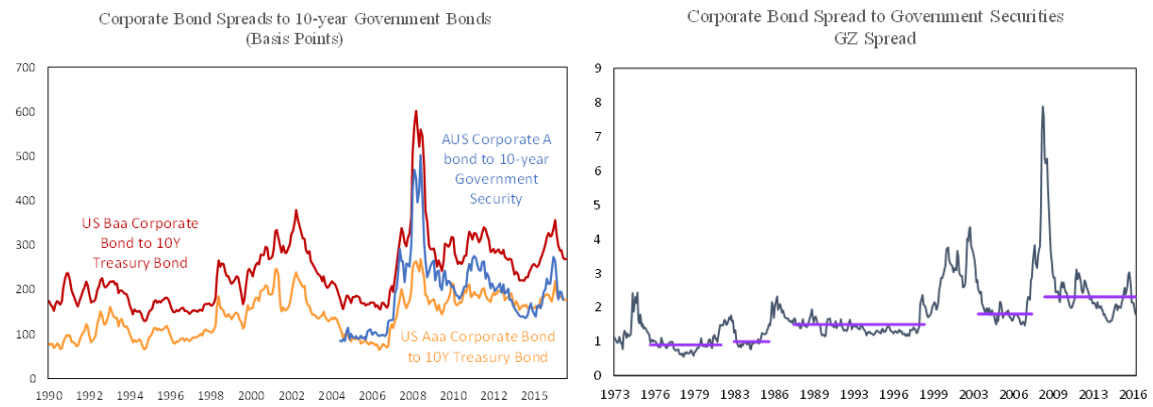
Figure 8: Money Aggregates



Notes: The monetary base (M_B or M_0) is defined as “holdings of notes and coins by the private sector plus deposits of banks with the Reserve Bank and other Reserve Bank liabilities to the private non-bank sector”. The Australian series used here is “D3 Monetary Aggregates: DMAMMB”, as distinct from the alternative series supplied as “D11: DCBMB, Monetary Statistics (IMF framework) – central bank survey”, which omits “D11: DCBLODC, *other* liabilities to authorised deposit-taking institutions”, including only central bank “liabilities to authorised deposit-taking institutions”. M_2 is defined as M_1 (currency and current deposits with banks) plus all other deposits at banks (including certificates of deposit) from the private non-ADI sector. For the UK and the US the series for M_B , M_2 and nominal GDP are from FRED. For China and Japan the M_B/Y series are approximated by “central bank assets as % of GDP”, also from FRED.

Sources: Federal Reserve Bank of St Louis (FRED) Database and Reserve Bank of Australia.

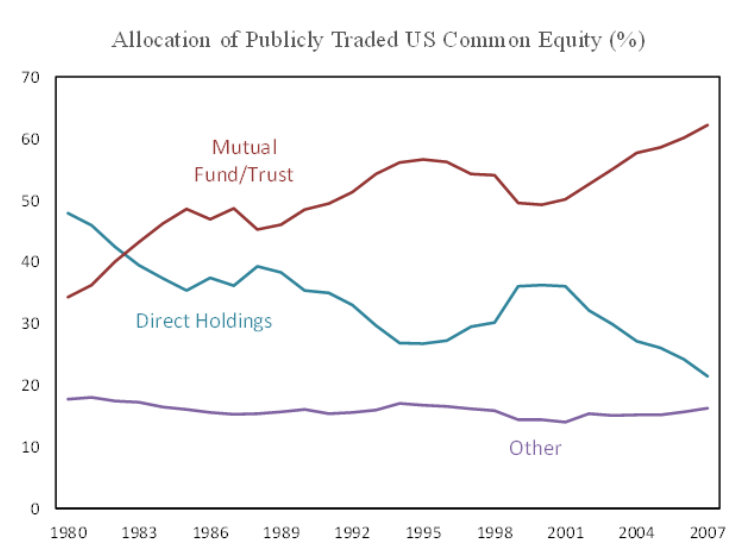
Figure 9: US and Australian Corporate Bond Spreads



Sources: Moody's seasoned Aaa corporate bond yield relative to the yield on the 10-year Treasury constant maturity bond. Data is monthly frequency, sourced from FRED and the RBA. The GZ spread: residual calculated according to the method of Gilchrist and Zakrajsek (2012).

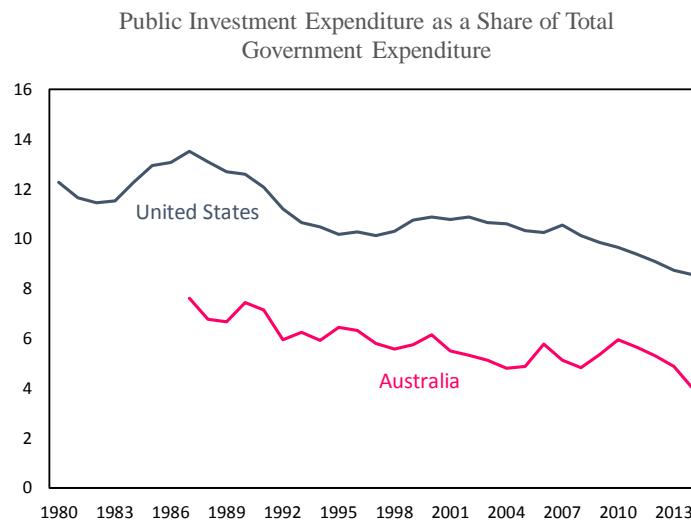
Notes: Purple lines on the GZ spread series illustrate increments between crises, and hence financial hysteresis.

Figure 10: Growth of Equity Assets under Management in the US



Source: French (2008), Table 1 data, and authors' calculations following advice from Richard Heaney.

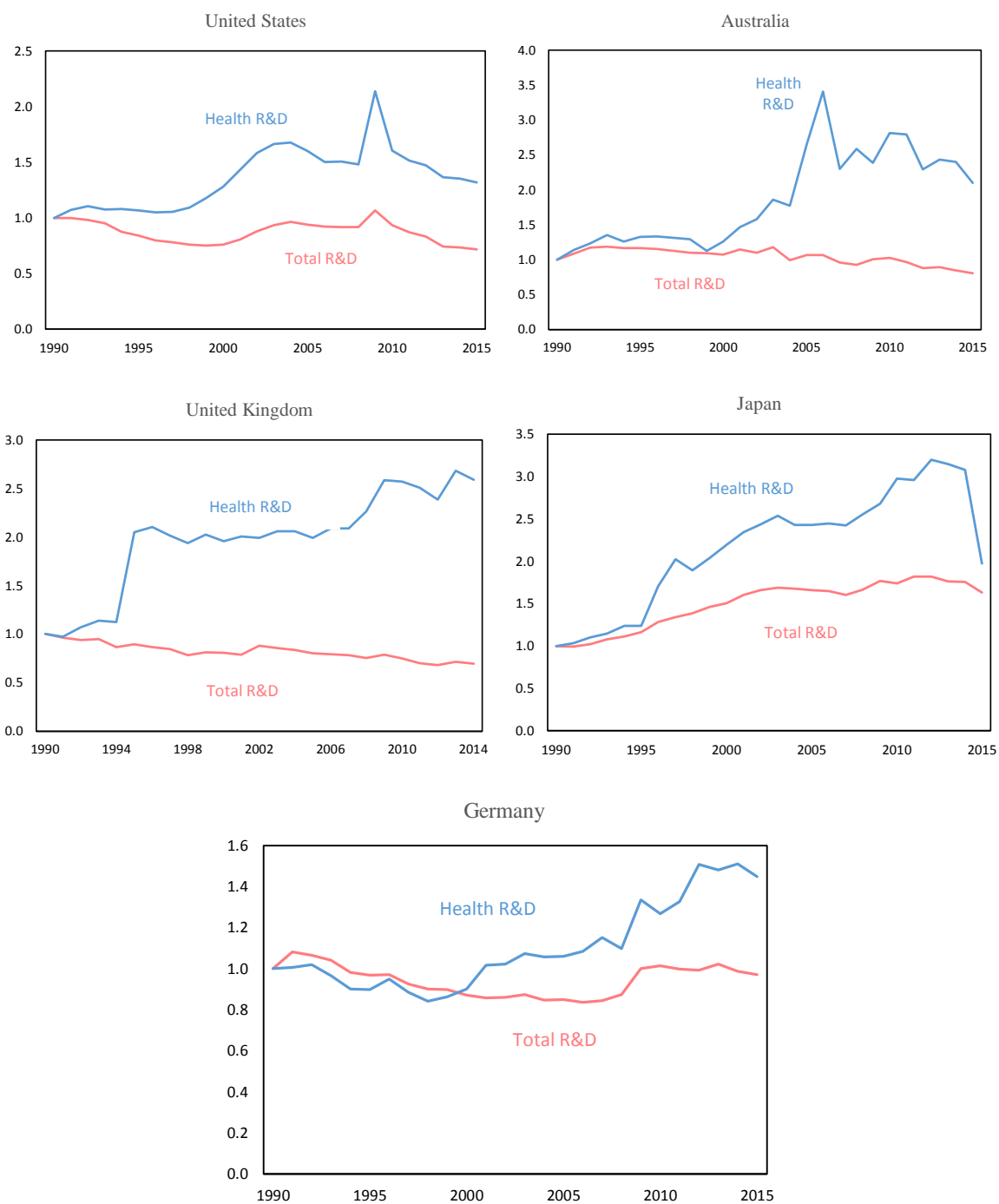
Figure 11: Public Infrastructure Investment



Notes: Public gross fixed capital formation and acquisition less disposal, as a share of total government expenditure. For Australia, infrastructure spending is the “total value of major infrastructure engineering construction by the public sector”.

Sources: For the US, OECD National Accounts Statistics; data set 11: Government expenditure by function. For Australia, the numbers for infrastructure investment are from BITRE (2015, Table 12.1C) and government expenditure is from ABS Catalogue 5204.0, both in chain volumes.

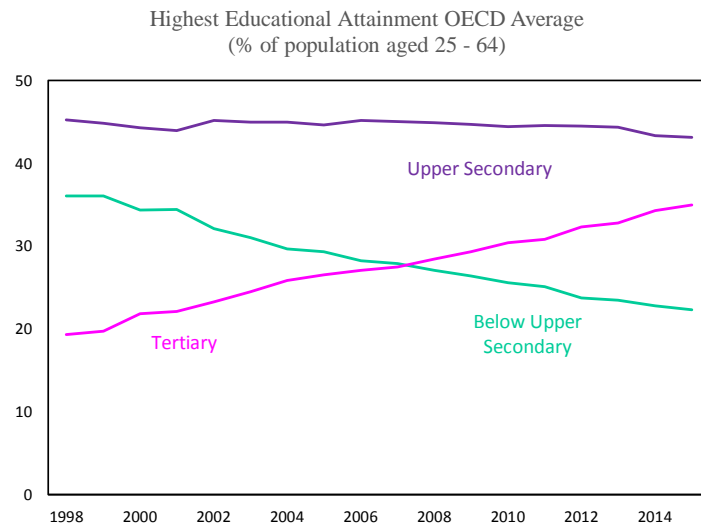
Figure 12: Government R&D Expenditure



Notes: R&D expenditure is reported as a percentage of GDP and defined as “Government budget appropriations or outlays for R&D”.

Sources: R&D data in national currency is from the OECD Database. GDP data is from the World Bank and expressed in local currency units.

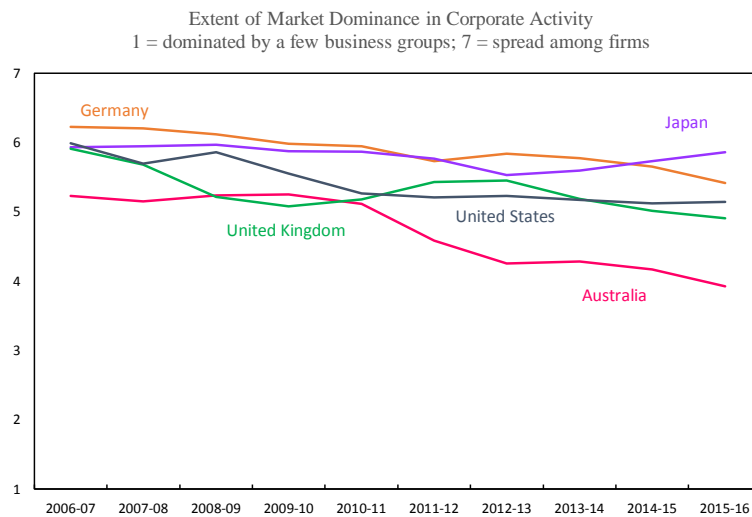
Figure 13: OECD Education Attainment



Notes: This indicator looks at adult education level as defined by the highest level of education completed by the 25-64 year-old population. There are three levels: below upper-secondary, upper secondary and tertiary education. Upper secondary education typically follows completion of lower secondary schooling. Lower secondary education completes basic education, usually in a more subject-oriented way and with more specialised teachers.

Source: OECD Education Statistics, all OECD countries 1997 – 2015.

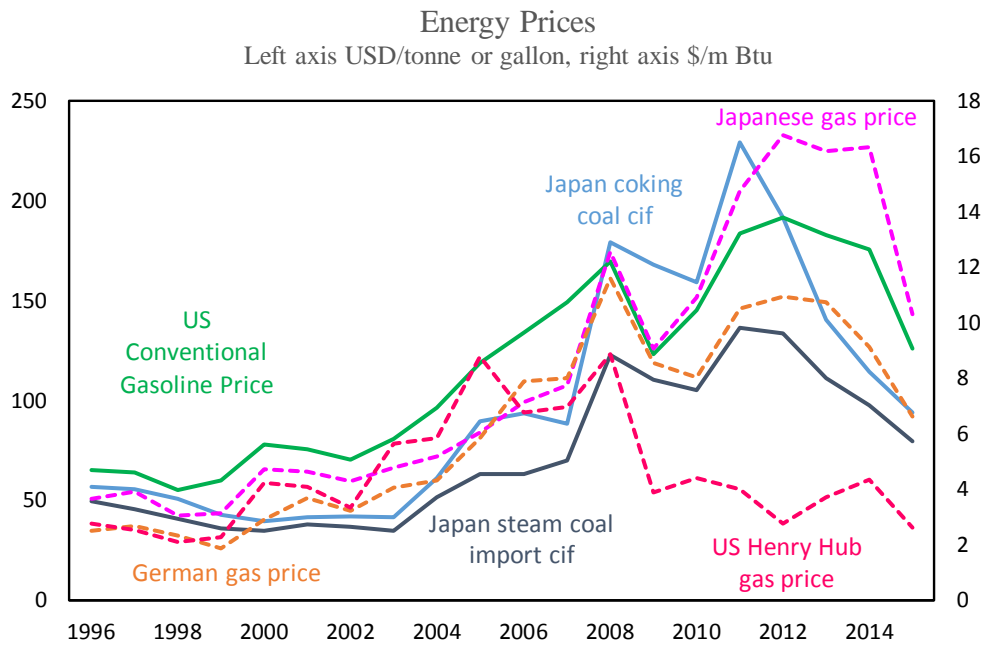
Figure 14: Market Concentration



Notes: This indicator offers the average answer to the question: “In your country, how would you characterise corporate activity? [1 = dominated by a few business groups; 7 = spread among many firms]”.

Source: World Economic Forum, Global Competitiveness Index Historical Dataset 2005 – 2015.

Figure 15: Fossil Fuel Prices



Notes: The three gas price series are identified with broken lines and measured on the right hand axis. CIF = cost + insurance + freight.

Sources: Gas prices, thermal and metallurgical coal prices from BP Statistical Review of World Energy, US petroleum prices from FRED.