Fiscal Sustainability and Human Capital Trade-Off in China: A Conceptual Analysis under Economic Slowdown

Khairunisah Kamsin[1*], James Alin[2], Mori Kogid[3], Faerozh Madli[4], Anita Kristina[5]

[1-4]Faculty Business, Economics and Accountancy, Universiti Malaysia Sabah (UMS)

[5]Department of Economics. University of Trunojoyo Madura, Indonesia

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ABSTRACT

China's rising public debt and recent economic slowdown have raised concerns about long-term fiscal sustainability and human capital development. This paper develops a simple conceptual framework to explain how public debt influences human capital investment in China. It argues that increasing debt reduces fiscal space, which may limit government spending on education, healthcare, and innovation. However, the relationship is not uniform and varies depending on economic conditions. During economic slowdown periods, the negative impact of public debt on human capital is stronger due to fiscal pressure and reduced revenues. In contrast, during stable or expansionary periods, the effect is weaker. The paper also highlights that human capital is essential for long-term fiscal sustainability because it enhances productivity and economic growth. This study contributes to understanding the trade-off between fiscal discipline and human capital investment in China and provides policy implications for sustainable development.

Keywords: public debt, human capital, fiscal sustainability, China, economic slowdown

INTRODUCTION

In recent years, China has experienced a steady increase in public debt, particularly at the local government level. At the same time, the country is facing slower economic growth, demographic aging, and rising fiscal pressure. These developments have raised important questions about fiscal sustainability and long-term development strategy.

One key concern is whether increasing public debt affects investment in human capital. Human capital, including education, health, and skills development, is critical for sustaining economic growth. However, governments facing high debt levels may prioritize debt servicing over long-term investment.

This paper provides a simple conceptual explanation of how public debt affects human capital investment in China, especially under different economic conditions.

LITERATURE REVIEW

Public Debt, Fiscal Sustainability, and Human Capital Development

The relationship between public debt and fiscal sustainability has become increasingly important as governments face growing fiscal obligations alongside development demands. Fiscal sustainability generally refers to the government's ability to finance current and future expenditure commitments without generating unsustainable debt accumulation or requiring substantial fiscal adjustments. Existing studies consistently suggest that rising public debt may weaken fiscal sustainability by increasing debt servicing burdens, reducing fiscal flexibility, and limiting policy options available during economic disturbances. Reinhart and Rogoff (2010), Panizza and Presbitero (2014), and Checherita-Westphal and Rother (2012) reported that persistent debt accumulation is often associated with weaker long-run economic performance, particularly when debt levels reach thresholds that constrain productive public spending. These studies collectively indicate that debt sustainability extends beyond debt magnitude and includes the government's capacity to maintain growth-enhancing expenditures while fulfilling financial obligations. A major strength of this literature lies in its extensive empirical evidence across both advanced and developing economies. However, existing studies predominantly concentrate on debt-growth relationships, while relatively limited attention has been directed towards the implications of debt accumulation for human capital formation and long-term fiscal resilience.

Human capital occupies a central position within sustainable development strategies because education, healthcare, innovation, and skills development contribute directly to productivity enhancement and economic expansion. Becker (1993), Lucas (1988), and Romer (1990) emphasized that human capital investment generates long-term economic benefits through knowledge accumulation, technological adaptation, and labour productivity improvement. Similarly, Barro (2013) demonstrated that economies characterized by stronger educational and health outcomes tend to achieve more stable and sustainable growth trajectories. The collective findings suggest that human capital functions not only as a social development objective but also as an economic asset that strengthens future fiscal capacity. The strength of this body of literature lies in its consistent theoretical and empirical support across different countries and development stages. Nevertheless, much of the existing research examines human capital as an independent determinant of growth rather than as a variable potentially influenced by public debt dynamics and fiscal constraints. Consequently, understanding of the interaction between debt accumulation and human capital investment remains incomplete.

The connection between public debt and human capital emerges primarily through fiscal allocation decisions. Increasing debt obligations often require governments to allocate a larger share of fiscal resources toward interest payments and debt servicing activities. Under such conditions, expenditure on education, healthcare, research, and innovation may face budgetary pressures. Modigliani (1961), Krugman (1988), and Panizza and Presbitero (2014) collectively argued that excessive debt may divert resources from productive investments and create expectations of future fiscal adjustment, thereby constraining developmental expenditure. The debt overhang mechanism proposed by Krugman (1988) further suggests that elevated debt levels generate uncertainty regarding future taxation and government spending priorities, discouraging long-term investment. Although these theoretical perspectives provide a valuable explanation of how debt can influence development outcomes, empirical investigations specifically examining the transmission of debt effects through human capital expenditure remain relatively limited. Most studies continue to focus on aggregate economic growth indicators rather than developmental expenditure composition, creating an important gap within the literature.

Economic Slowdown, Fiscal Pressure, and Human Capital Vulnerability

Recent developments in the global economy have increased scholarly interest in the interaction between public debt and economic conditions. Evidence increasingly suggests that the consequences of debt accumulation vary according to macroeconomic circumstances rather than remaining constant across time. Reinhart and Rogoff (2010), Égert (2015), and Chudik, Mohaddes, Pesaran, and Raissi (2017) reported that the economic effects of public debt frequently exhibit nonlinear characteristics, with adverse outcomes becoming more pronounced under unfavorable economic conditions. These findings challenge traditional linear perspectives and indicate that debt sustainability should be evaluated within broader economic environments. A notable strength of this research stream is its recognition of asymmetric and regime-dependent relationships. However, many studies focus primarily on growth performance and provide limited explanation regarding how economic slowdowns affect government expenditure priorities, particularly expenditure related to human capital development. This is important because recent research emphasizes that human capital is closely interconnected with economic growth, poverty reduction, employment opportunities, and sustainable development (Kamsin et al., 2026).

Economic slowdown increases fiscal pressure through multiple channels. Lower economic activity generally reduces tax revenue, weakens business performance, lowers household income, and constrains government fiscal capacity. Simultaneously, expenditure requirements frequently increase because governments introduce stabilization measures to support economic recovery. Blanchard (2019), Ghosh, Ostry, Kim, and Qureshi (2018), and Kose, Ohnsorge, Sugawara, and Yu (2022) highlighted that fiscal challenges become more severe when slowing economic growth coincides with elevated debt levels. Under such circumstances, fiscal

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authorities face increasing difficulty maintaining developmental expenditure while preserving fiscal stability. This concern is particularly relevant to human capital development because investment in education, skills development, and research and development contributes to long-term economic growth and sustainable development (Kamsin et al., 2026). The literature therefore provides strong evidence regarding the interaction between economic growth and fiscal conditions; however, fewer studies have explicitly examined how economic slowdowns influence the relationship between public debt and human capital expenditure. As a result, understanding remains fragmented concerning the mechanisms through which economic downturns intensify developmental trade-offs.

China presents an important context for examining these issues because the country has experienced a gradual moderation in economic growth following decades of rapid expansion. Structural economic transformation, demographic ageing, productivity adjustments, and external economic uncertainties have contributed to slower growth performance. The relevance of China to the human capital dimension is also reflected in the recent literature, where China is identified as one of the most prominent countries in research examining the relationship between foreign investment, human capital development, economic growth, and sustainable development (Kamsin et al., 2026). Moreover, Kamsin et al. (2026) identify economic growth, human capital, and sustainable development as central and interconnected themes within the recent literature, while emphasizing the importance of education, skills development, and research and development for sustainable economic development. Although existing studies provide substantial discussion regarding China's debt accumulation and economic transition, relatively little conceptual work has systematically integrated public debt, economic slowdown, fiscal sustainability, and human capital investment within a single analytical framework. This limitation indicates the need for further research capable of explaining these interconnected relationships more comprehensively.

Human Capital as a Mechanism for Fiscal Sustainability

While a significant portion of the literature emphasizes the risks associated with rising public debt, another important research stream highlights the role of human capital in strengthening fiscal sustainability. Becker (1993), Lucas (1988), and Romer (1990) consistently argued that investments in education, healthcare, and innovation generate productivity gains that contribute to long-term economic growth. Higher productivity improves labour market performance, expands income generation, and increases tax revenues, thereby strengthening government fiscal capacity. This perspective suggests that human capital should not be viewed solely as government expenditure but also as an investment that generates future fiscal returns. The strength of this literature lies in its long-term perspective, which recognizes the dynamic relationship between development expenditure and economic performance. However, limited integration exists between human capital theory and fiscal sustainability frameworks, resulting in insufficient understanding of how developmental spending contributes to debt sustainability over time.

Recent studies further suggest that reductions in human capital expenditure may produce unintended long-term consequences. Checherita-Westphal and Rother (2012), Law, Ng, Kutan, and Law (2021), and Panizza and Presbitero (2014) noted that sustainable growth depends not only on fiscal discipline but also on maintaining productive investments that support future economic expansion. Excessive emphasis on short-term fiscal adjustment may reduce education and healthcare investment, potentially weakening productivity growth and future revenue generation. Such outcomes may ultimately complicate debt management efforts rather than improve fiscal sustainability. In this regard, Kamsin et al. (2026) emphasize that the effects of public debt on long-term economic performance are influenced by broader macroeconomic conditions, including fiscal space, external financing dependence, macroeconomic stability, and investor confidence. Their conceptual framework further demonstrates that persistent external imbalances can amplify fiscal vulnerabilities by increasing dependence on foreign financing and reducing policy flexibility. This perspective reinforces the argument that fiscal sustainability should be assessed within a broader framework of long-term economic conditions rather than through debt indicators alone.

The importance of considering developmental dimensions is further supported by Kamsin et al. (2026), who argue that excessive public debt can constrain economic expansion through higher debt-servicing costs, reduced fiscal flexibility, and increased macroeconomic uncertainty. They further note that the relationship between public debt and economic growth varies according to institutional quality, debt structure, and prevailing macroeconomic conditions. Although this argument primarily concerns external-sector conditions rather than human capital expenditure, it provides an important basis for conceptualizing fiscal sustainability as a multidimensional process. Consequently, integrating human capital investment into fiscal sustainability analysis may provide a more comprehensive understanding of whether government expenditure contributes to future productive capacity and economic resilience. This limitation highlights the importance of adopting broader approaches when assessing fiscal sustainability, particularly approaches that consider the interaction between public debt, productive expenditure, economic growth, and long-term development outcomes.

Theoretical Foundations and Research Gaps

The existing literature is largely grounded in Debt Overhang Theory and Crowding-Out Theory. Debt Overhang Theory proposed by Krugman (1988) suggests that excessive debt discourages investment because future fiscal adjustments create uncertainty regarding returns to productive activities. Crowding-Out Theory developed by Modigliani (1961) argues that government borrowing can displace productive investment by absorbing financial resources and increasing financing costs. These theoretical perspectives have received considerable empirical support from studies including Reinhart and Rogoff (2010), Checherita-Westphal and Rother (2012), and Panizza and Presbitero (2014). Collectively, these studies provide a strong theoretical foundation for understanding how debt accumulation may constrain long-term development. Nevertheless, theoretical applications have focused predominantly on growth outcomes, while comparatively limited attention has been directed toward human capital channels and fiscal sustainability considerations.

Several important research gaps emerge from the existing literature. First, despite extensive research on public debt and economic growth, limited studies explicitly examine how public debt affects fiscal sustainability through human capital investment. Second, existing research frequently treats human capital as an independent determinant of growth rather than as an outcome potentially influenced by fiscal constraints arising from debt accumulation. Third, many studies rely on linear analytical frameworks despite growing evidence presented by Égert (2015), Chudik et al. (2017), and Law et al. (2021) indicating that debt effects vary across economic conditions. Fourth, limited conceptual research has integrated public debt, human capital development, fiscal sustainability, and economic slowdown within the context of China. Finally, the majority of existing studies focus on either fiscal sustainability or human capital separately, creating fragmented understanding of their interaction. These gaps establish a clear need for research that develops an integrated framework capable of explaining how rising public debt influences human capital investment and fiscal sustainability under changing economic conditions. Such a framework may contribute to a deeper understanding of long-term development challenges and provide a foundation for future empirical investigation.

CONCLUSION

This study develops a conceptual framework to explain the relationship between public debt, human capital, and fiscal sustainability in China under conditions of economic slowdown. The analysis suggests that rising public debt may reduce fiscal flexibility and increase budgetary pressure, potentially limiting government capacity to sustain investment in education, healthcare, innovation, and skills development. The conceptual discussion further indicates that the consequences of debt accumulation are not constant across economic conditions. During periods of weaker economic performance, declining fiscal revenues and increasing expenditure commitments may intensify the pressure on developmental spending, thereby strengthening the trade-off between fiscal adjustment and human capital investment. These interactions highlight the importance of considering broader macroeconomic conditions when evaluating the long-term implications of public debt for sustainable development.

At the same time, the framework emphasizes that human capital should be viewed not only as a component of public expenditure but also as a strategic asset that contributes to future fiscal sustainability. Sustained investment in human capital supports productivity improvement, economic resilience, and long-term revenue generation, which may strengthen fiscal capacity over time. Consequently, policies focused exclusively on debt reduction without adequate consideration of developmental expenditure may generate unintended long-run economic costs. The study contributes to the growing discussion on fiscal sustainability by integrating public debt, economic slowdown, and human capital development within a single conceptual perspective. Future research may extend this framework through empirical investigation to examine the magnitude, direction, and potential nonlinear characteristics of these relationships within China and other economies facing similar fiscal and demographic challenges.

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