The Importance of the Public Sector Workforce to the Productivity of the Public Sector: The Case of Hong Kong SAR

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Introduction

Studies within the economics discipline have consistently treated productivity growth or total factor productivity (TFP) as the critical factor in generating economic growth (Solow, 1956, 1957; Jorgenson and Griliches, 1967; Harcourt, 2006; Taylor, 2007). Paul Krugman (1997) once said, "Productivity isn't everything, but in the long run it is almost everything" (p.11). Despite its importance, there have been no TFP studies conducted on the public sector. It is possible that a lack of reliable data and differences in institutional peculiarities have rendered the traditional TFP analytical tools inappropriate for examining the productivity growth of the public sector. This omission is troubling because of the rising fiscal constraints faced by governments. Cutbacks in government spending on resources – human and capital – would suggest that governments will have to search for alternative means to deliver the same amount and standard of services. It is thus timely for TFP studies to be extended to the public sector.

Government productivity versus private sector productivity

Is the public sector productive? The reality is that no one can tell accurately because no one has measured empirically the productivity of the public sector. Why is this so? Could it be due to the unavailability of reliable data? Rather the contrary. In the last

50 years or so, government agencies around the world have been collecting massive amount of data, and the quality and reliability of the data collected have been improving ever since. Or is it because government productivity is something of an illusive concept, and as such, it is not only difficult to measure but also there is no appropriate framework to measure empirically the productivity of the public sector? Maybe not. Solow (1956) introduced a model to measure the impact of productivity on aggregate output growth. A year later, Solow (1957) tested the model on the U.S economy and found that productivity growth accounted for seventh-eights of U.S growth per worker over the first half of the twentieth century. Since then, the Solow (1956) model has become the standard and most widely used approach to measure or quantify the impact (or contribution) of productivity to output growth. A large proportion of the literature in exploring the rapid economic growth of the East Asian countries revisited the Solow (1956) growth model in order to understand their growth process. In fact, the Solow growth model has not enjoyed this much recognition since its introduction in 1956. The Solow (1956) model not only provides a razor-edge measurement method for productivity growth, but more importantly, the model demonstrates that productivity growth is the engine of long run sustainable economic growth. Solow won the Nobel Prize in 1986 for his 1956 growth model.

Since its introduction some 60 years ago, and given its wide popularity, it is hard to see why this model has not being utilised to measure the productivity growth of the public sector. Perhaps, it makes very little sense in carrying out empirical studies to what is thought to be obvious, that is, the private sector is more productive than the public sector. There is a strong preconceived and readily accepted view that public servants are lazy, unproductive and wasteful. According to the ‘new’ public

management literature there is a productivity 'gap' between the public sector and private sector, in that the private sector productivity is always higher. That 'gap' can only be narrowed if governments deploy best practices borrowed from the private sector (leading to the privatisation and corporatisation of the public sector). Not forgetting the recent trendy public-private partnership initiatives. Yet, the need to privatise and corporatise are based on ideas that are not empirically grounded. Even the ideas, in themselves, are unsound. They are divorced from the 'real world'. Just about all the ideas put forward by the 'new' public management school of thought for arguing on the superiority of the private sector works on the flat (static) assumptions that used to build the 'perfect competition model'. Once all the assumptions of the perfect competition model are relaxed, we arrived at a world of monopoly and oligopoly (classic market failure). Despite the lack of empirical evidences to support the preconceived view regarding the superiority of the private sector, the restructuring of the public sector mimicking the business practices of the private sector continues at a rapid pace on a global scale.

How does government productivity compare with the private sector productivity in Hong Kong?

The primary aim of this paper is to compare the productivity of the public sector with the productivity of the private sector in Hong Kong for the period 2010 – 2015. There are several methods in which to measure productivity growth. In this exercise the Total Factor Productivity (TFP) approach is utilised because (1) it is simply the best and most transparent approach available (Taylor, 2007; Harcourt, 2006), and (2) it is the standard and most widely used approach to measure productivity growth. What

exactly is TFP? Briefly, output can be driven (or produce) either by increasing factor inputs (i.e. capital and labour), or by increasing the productivity of both (total) capital and labour (hence, TFP). In other words, we can increase output growth rates either by employing more capital and labour, or use the existing capital and labour more efficiently. Since both approaches increases output, does it matter which one we choose? According to the Solow (1956, 1957), it does matters, especially in the long run. Whether a country or a sector can get onto the path of sustained growth is very much dependent upon which production approach it takes. The production approach that is based on employing more capital and labour will not be sustainable in the long run as this type of production technique is subject to law of diminishing returns. On the other hand, the effective usage of capital and labour will avoid diminishing returns. A positive TFP growth will suggest that the growth is productivity driven, and this type of output growth is sustainable. A minimum or negative TFP growth will suggest an accumulation (increasing capital and labour) process, and therefore is not sustainable. Intuitively, TFP values provide a rough measure of an economy's or a firm's ability (or capacity) to escape the constraint of diminishing returns. As such, it can be a useful tool for monitoring the state of the production process. If TFP is found to be negative, policy makers (managers) can initiate incentives to increase the activities associated with the advancement of technological progress such as, R&D or the expansion of the education system.

A Model for Measuring TFP Growth

The Solow (1956) model, which is extended to include human capital, can be summarised with the following production relationship:

$$Y_t = A_t K_t^{\alpha} {}_H L_t^{\beta} \quad (1)$$

Where;

Y is the aggregate real output. *A* indicates TFP. *K* denotes real capital stock.

The measurement of capital stock (*K*) in this production function takes into account the sum of capital stock from all existing vintages (following the definitions of capital by Taylor, 2007; Kaldor and Mirrless, 1962; Salter, 1966; Solow, 1960):

$$\int_{i=1}^{t} I_i - \delta_i / P_i \quad (2)$$

where *I* denotes gross domestic investment, *t* represents the age of the oldest vintage, δ is depreciation, and *P* is the price level.

α is a parameter with a value between 0 and 1, equal to the capital's share of the value of output, and β is the labour's share of the value of output. Equation (1) is to have a constant returns to scale type production function in that $\alpha + \beta = 1$. So the value β can be derived from 1- α.

Labour (*L*) includes a quality component, *H*, in the form of human capital (*HL*). The reason being that government jobs are highly specialised and required highly qualified workers to do the jobs effectively. *H*, in this case, is a proxy for effort, in the sense that individuals with higher labour quality (*H*) will put forth more effort while carrying out their duties.

By taking logs and differentiating with respect to time, output growth can be derived

from equation (1), as shown below:

$$\dot{y}_t = a_t + \alpha\dot{k}_t + (1 - \alpha)\dot{l}_t \qquad (3)$$

Once an estimate of α is provided, $\hat{\alpha}$, then TFP, $\hat{a}_t$, is estimated as follows:

$$\hat{a}_t = \dot{y}_t - \hat{\alpha}\dot{k}_t - (1 - \hat{\alpha})\dot{l}_t \qquad (4)$$

Data and the Estimations of TFP

Data for output, capital, and labour were obtained from the various Government of Hong Kong official publications, *Hong Kong in Figures*. The aggregate output, *Y*, is the real output, deflated by the price level (2009 = 100). Labour, *L*, is the number employed in the public sector and private sector. Capital, *K*, in this context is derived from equation (2) using real gross domestic investment, weighted by the 2009 price index for both public and private investments. An annual depreciation rate of 4 per cent (Nehru & Dhareshwar, 1993) is applied to take into account the depreciation of physical capital. Table 1 shows the average annual growth rates (in percent) of real output (*Y*), real capital (*K*), and labour (*L*) for the public and private sectors in Hong Kong for the period 2010-2015.

Table 1: Real Output (*Y*), Real Capital (*K*) and Labour (*L*): Average growth rates (%), Public Sector and Private Sector, Hong Kong, 2010 – 2015

	Y	*K*	*L*
Public Sector	3.3	1.7	0.6
Private Sector	3.9	3.5	0.9

Sources: Government of the Hong Kong SAR, 2008, 2010, 2014, 2016

The determination of TFP would, in the first instance, require the coefficients of α and β. We begin with an equal share in that: $\alpha = 0.50$ and $\beta = 0.50$. In the later part of this paper, we will recalibrate (increasing and decreasing) both the α and β values to see whether there is any impact on TFP growth. By substituting these coefficients together with the average annual growth rates of real output (Y), real capital (K), and labour (L) found in Table 1, TFP growth for the public sector and the private sector in Hong Kong can be measured using equation (4). Table 2 shows TFP growth for the public and private sectors.

Table 2: TFP Growth for the Hong Kong Public Sector and Private Sector, 2010 – 2015

	A	*β*	*TFP growth (annual average %)*
Public Sector	0.50	0.50	2.15
Private Sector	0.50	0.50	1.70

The results in Table 2 show that, for the period 2010-2015, TFP for the Hong Kong public sector grew at an average rate of 2.15 % per year as compared to 1.70 % per year for the private sector. Looking from an absolute percentage point there seems to be only a small positive difference between the TFP growth rates of the public sector (2.15%) and the private sector (1.70%). However, absolute percentage point on TFP growth does not gives a complete and meaningful picture of the output growth process. What is of more meaningful and importance is to see whether TFP growth is a major determinant of output growth for the two sectors in Hong Kong. To do that, we need to decompose the output growth into three factors. The first is due to growth in labour input, the second is due to growth in capital input, and the third is due to increase in the productivity of both capital and labour, hence TFP. The data found in

Table 1 and Table 2 are substituted into equation (4) to decompose the output growth of the two sectors in Hong Kong. The results of the decompositions are shown in Table 3.

Table 3: Annual contribution to percentage growth in output, public sector and private sector, Hong Kong, 2010-2015

	Y	*K*(α)	*L*(β)	TFP
Public Sector	3.3	0.85	0.30	2.15
Private Sector	3.9	1.75	0.45	1.70

Notes: $\alpha = 0.50, \beta = 0.50$

For the period 2010-2015, the public sector experienced an average annual output (*Y*) growth of 3.3 per cent. Capital (*K*) contributed 0.85 per cent to that output growth, labour (*L*) contributed 0.30 %, and TFP contributed 2.15 %, which is, nearly half to the 3.3 % output growth. As for the private sector, the results in Table 3 show that capital (*K*) is the largest contributor to output growth (*Y*). It seems that TFP growth is a major determinant of output growth for the public sector in Hong Kong over the 2010-2015 period. TFP played a far more significant role in the production of output in the public sector than in the private sector. In short, output growth in the public sector is largely a productivity driven process.

Further increases in public sector TFP: A simple experiment

Earlier on, we mentioned that labour (*L*) includes a quality component (*H*), and is a proxy for effort. It is possible that individuals with higher labour quality (*H*) will put forth more effort, and vice versa, in completing their jobs. If this is the case, it is just a matter of asking workers to put forth higher effort to drive higher TFP growth.

However, it may not be as straight forward as that. This is because it is not in the interest of workers to put forth extra effort on top of what they have already put forth, without being given additional compensation or incentives. There is a large management literature that argues employees tend to respond strongly to incentives. If incentives are properly designed they can be important sources of value creation. Monetary rewards and non-monetary rewards are two traditional forms of incentives in which to motivate workers. Here, non-monetary reward takes the form of public sector motivation (PSM), and monetary reward is efficiency wage (Ew).

PSM, Efficiency Wage and Effort

The efficiency wage literature maintains that agencies can raise their employees' effort by paying their employees a wage rate that is above the market clearing rate (Solow 1979). If employment contracts are incomplete, and employees have an incentive to shirk on their job, and their work is difficult to observe and evaluate, then paying a wage premium can raise the costs of shirking because employees stand to lose this wage premium if they are caught shirking (Shapiro and Stiglitz 1984; Yellen 1984). Paying a wage premium improves not only employee responsibility and loyalty (Akerlof 1982), but also the recruitment and retention of high calibre employees (Stiglitz 1985; Weiss 1980).

Similarly, the equity theory suggests that employees seek to maintain equity between the ratios of the inputs that they bring to a job (e.g., effort) and the outcomes that they receive from it (e.g., pay) against the corresponding ratios of relevant referents (e.g., workers in similar occupations from the private sector). Equal ratios contribute to perceptions of fairness, which lead to favorable work outcomes (e.g., high

performance) (Adams 1965; Choi and Chen 2007). Public sector studies on efficiency wages are however few. Although Llorens and Stazyk (2011) found that wage discrepancy between the public sector and private sector did not influence voluntary separation rates among state government employees, others have reported that efficiency wages have a significant positive impact on service quality and employees' effort (Davis and Gabris 2008; Leavitt and Morris 2008; Taylor and Taylor 2011).

The PSM literature has generally established a positive link between PSM and effort (Bright 2008; Perry *et al.* 2010; Taylor 2008). Employees who hold a public service identity are proposed to have high levels of PSM, resulting in autonomous self-regulation (Ryan and Deci 2005), and in turn high performance (Vandenabeele 2007). In addition, in their drive to help others, employees with high PSM levels are expected to feel guilty if they believe that they have failed in their attempts to help others, and satisfied if they perceive that they have succeeded in their efforts. By fostering anticipatory feelings of guilt and gratitude, PSM can encourage people to invest greater effort in their tasks (Grant and Wrzesniewski 2010).

Studies on the relationship between wages and PSM suggest that high wages have not contributed to or diminished an individual's desire to perform public service (Brewer and Selden 1998; Rainey 1982; Taylor 2008). This does not imply that wages are irrelevant to all government workers. Several researchers such as Rainey (1982), Crewson (1997), and Taylor and Taylor (2011) have reported that wages are an important motivator for many government workers. Based on their findings of significant relationships between monetary rewards and two of the four conceptions of PSM that they studied, Brewer *et al.* (2000) stated that monetary rewards are

relevant to some individuals with high levels of PSM but not to others, based primarily on their conceptions of public service and the public interest.

Further, in their motivation crowding theory, Frey and associates (Frey 1997; Frey and Jegen 2001) argued that wages could positively or negatively affect employees' PSM depending upon whether they perceived the wages as controlling or supportive. Wages could 'crowd out' employees' intrinsic motivation and reduce their effort if they see wages as a device to control their behavior, or if the wage scheme conflicts with their views (e.g., professional norms). Here, efficiency wages at the expense of an employee's PSM could cause him/her to experience alienation. Wages could also 'crowd in' employees' intrinsic motivation when they view the wages as supportive, i.e., an acknowledgement of their work effort and their high intrinsic work motivation. Employees who receive a small monetary reward for an accomplishment may not be very motivated by the token reward (instrumental value), but they may be highly motivated after receiving recognition for the accomplishment of a job (symbolic value). Here, efficiency wages merely serve as the conduit through which PSM travels.

The importance of considering both the PSM and wages of employees in driving their effort output was also raised By Knoke and Wright-Isak (1982). In the predisposition-opportunity theory, Knoke and Wright-Isak (1982) argued that the self-regulation of employees' job outcome depends on the incentives offered by the organization. They proposed that a match between the incentive systems and individual motives contributes to the employee's commitment to the organization and in turn affects his/her job outcome. Without a match between organizational incentives and

individual motives, no self-regulated public service motivated behavior will occur (Perry and Vandenabeele 2008).

Adjusting the *β* coefficient to get higher TFP growth

In this model, *H* does not impact directly upon TFP, but through, *β*, which is the coefficient of labour. It is possible that the value of *β* will be higher due to improvements in labour quality being driven by PSM and Ew, which in turn, drive higher TFP growth. To simplify this experiment, we assume an equal contribution from PSM and Ew. For instance, if *β* has a value of 0.60; then PSM contributes 0.30 and Ew contributes the other 0.30. In the previous TFP calculation a *β* value of 0.50 was used, resulting in 2.15% TFP growth. In the following section, *β* is recalibrated with different values as shown in Table 4.

Table 4: *β* values and TFP growth, Hong Kong public sector, 2010-2015

Y (Annual Average %)	K (Annual Average %)	L (Annual Average %)	β	TFP growth (Annual Average %)
3.3	1.7	0.6	0.5	2.15
3.3	1.7	0.6	0.6	2.26
3.3	1.7	0.6	0.7	2.37
3.3	1.7	0.6	0.8	2.48

The increasing *β* value is consistent with the proposition that PSM and Ew increases the effort levels of workers as discussed earlier. Each time the weightage or value of *β* is increased, TFP growth increases. For instance, a *β* = 0.50 would result in a 2.15% TFP growth. Increasing to *β* = 0.80 would increase TFP growth to 2.48%, despite the same amount of output (*Y*), capital (*K*), and labour (*L*) being used in all the

calculations, as shown in Table 4. The simple experiment demonstrates that TFP is highly sensitive to the size of β.

Next, a similar experiment on the coefficient of capital, α, is conducted to see its impact on TFP growth. The aim is to see whether an increase in resources devoted to capital actually boost higher TFP growth. The α value is increased from 0.50 to 0.80 as shown in Table 5.

Table 5: α value and TFP growth, Hong Kong public sector, 2010-2015

Y (Annual Average %)	K (Annual Average%)	A	L (Annual Average %)	TFP (Annual Average %)
3.3	1.7	0.5	0.6	2.15
3.3	1.7	0.6	0.6	2.04
3.3	1.7	0.7	0.6	1.93
3.3	1.7	0.8	0.6	1.82

The results in Table 5 show that as the α value becomes higher ,TFP growth on the other hand, becomes lower. This is opposite to that of the labour side. The results from Table 4 and Table 5 suggest that increasing the labour quality of the workforce is far more important than increasing capital. The higher the value of β, the higher is TFP growth as compare to the higher the value of α, the lower is TFP growth. In short, increasing the size of resources devoted to capital is not enough for long run output growth, and may not be productive if 'development' policy to further improve the productivity of the public sector is not accommodated by an effective 'motivational' policy to drive forth more effort.

Conclusion

Productivity growth is the domain of the private sector is myth propagated by the popular press and the 'new' public management literature. A large part of the rhetoric triumph the superiority of the private sector in driving economic efficiency comes from simplified ideas that are not empirically grounded. Even with the lack of empirical evidences, many are still comfortable to accept the presumption that there is a productivity gap between the public sector and the private sector, in that the private sector productivity will always be higher than the public sector. This paper found otherwise. The empirical findings of this paper found that the Hong Kong public sector has a higher TFP growth and the output growth of this sector is largely driven by productivity growth. This reminds us of a very long debate (lasting more than 2 decades) on the 'East Asian growth miracle'. Prior to the publications of two influential works by Kim and Lau (1994), and Young (1992, 1994), it was often though that productivity growth had a played a big part in driving the rapid growth of the East Asians economies. When Young presented his empirical findings to the European Economic Association in 1993, his conclusion, that growth in this part of the world was an accumulation process, was not well received. It is not hard to see this. A visitor to Hong Kong and Singapore will see a modern and sophisticated city-state with infrastructures that rival many European cities. Young (1995) published a follow-up paper that carefully scrutinised the data. The findings of the reworked version were similar to the previous findings in that productivity growth played little role in the East Asian growth miracle. Young (1992, 1994, 1995) empirical findings not only caused a big stir (interpretations and the reinterpretations of the relationship between TFP and long run economic growth), but it also changed the direction of that debate from presumption to empirical.

REFERENCES

Adams, J.S. (1965) 'Inequity in Social Exchange' in L. Berkowitz (ed.) *Advances in Experimental Social Psychology*. New York: Academic Press.

Brewer, G. A. and Selden, S. C. (1998) Whistle Blowers in the Federal Civil Service: New Evidence of the Public Service Ethic. *Journal of Public Administration Research and Theory*, 8:3 pp413-439.

Brewer, G. A., Selden, S. C. and Facer, R. L., II. (2000) Individual Conceptions of Public Service Motivation. *Public Administration Review*, 60 pp254-264.

Bright, L. (2008) Does Public Service Motivation Really Make a Difference on the Job Satisfaction and Turnover Intentions of Public Employees?, *American Review of Public Administration*, 38:2 pp149-66.

Crewson, P. E. (1997) Public-service motivation: Building empirical evidence of incidence and effect, Journal *of Public Administration Research and Theory, 7* pp499-518.

Akerlof, G.A. (1982). Labor contracts as partial gift exchange. *Quarterly Journal of Economics*, 97, pp543-569.

Choi, J.P. and Chen, C.C. (2007) The Relationships of Distributive Justice and Compensation System Fairness to Employee Attitudes in International Joint Ventures, *Journal of Organizational Behavior*, 28 pp687–703.

Davis, T. J., and Gabris, G. T. (2008) Strategic Compensation Utilizing Efficiency Wages in the Public Sector to Achieve Desirable Organizational Outcomes, *Review of Public Personnel Administration*, 28 pp327-348.

Frey, B. S. (1997) On the Relationship Between Intrinsic and Extrinsic Work

Frey, B. S. and Jegen, R. (2001) Motivation Crowding Theory, *Journal of Economic Surveys*, 15 pp589-611.

Government of the Hong Kong (SAR), 2008, 2010, 2014, 2016. '*Hong Kong in Figures'*, Census and Statistics Department, Wan Chai.

Grant, A.M. and Wrzesniewski, A. (2010) I Won't Let You Down . . . or Will I? Core Self-Evaluations, Other-Orientation, Anticipated Guilt and Gratitude, and Job Performance, *Journal of Applied Psychology*, 95:1 pp108–21.

Harcourt, G.C., 2006. *The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers*, Cambridge University Press, Cambridge.

Jorgenson, D.W., and Griliches, Z., 1967. 'The Explanation of Productivity Growth', *Review of Economic Studies*, 34 pp249-83.

Kaldor, N., and Mirrlees. J.A., 1962. 'A New Model of Economic Growth', *Review of Economic Studies*, XXIX, pp. 174-192.

Kim, J.L., and Lau, L.J., 1994. 'The sources of economic growth of the East Asian newly industrialized countries', *Journal of the Japanese and International Economics*, 8 pp3-22.

Knoke, D. and Wright-Isak, C. (1982) Individual Motives and Organizational Incentive Systems, *Research in the Sociology of Organizations*, 1:2 pp209-54.

Krugman, P., 1997. *The Age of Diminished Expectations*, MIT Press, Cambridge, Massachusetts.

Leavitt, W. M. and Morris, J. C. (2008) Market-based Pay in Action: Municipal Strategies and Concerns in the Cities of Hampton Roads, *Review of Public Personnel Administration*, 28 pp178-189.

Llorens, J.J. and Stazyk, E.C. (2011) How Important Are Competitive Wages? Exploring the Impact of Relative Wage Rates on Employee Turnover in State Government, *Review of Public Personnel Administration*, 31 pp111-127.

Nehru, V., and Dhareshwar, N., 1993. 'A new database on physical capital stock: sources, methodology and results', *Rivista de Analisis Economico*, 8 (1) pp37-59.

Perry, J.L. and Vandenabeele, W. (2008) Behavioral Dynamics: Institutions, Identities and Self-Regulation, in J.L. Perry and A. Hondeghem (eds), *Motivation in Public Management: The Call of Public Service*, Oxford: Oxford University Press.

Perry, J.L., Hondeghem, A. and Wise, L.R. (2010) Revisiting the Motivational Bases of Public Service: Twenty Years of Research and an Agenda for the Future, *Public Administration Review*, 70:5 pp681–90.

Rainey, H. G. (1982) Reward Preferences Among Public and Private Managers: In Search of the Service Ethic, *American Review of Public Administration*, 16:4 pp288-302.

Ryan R.M. and Deci, E.L. (2005) 'On Assimilating Identities to the Self: A Self-Determination Perspective on Internalization and Integrity Within Cultures' in M.R. Leary and J.P. Tagney (eds) *Handbook of Self and Identity*, New York: Guilford.

Salter, W.E.G., 1966, with addendum by Reddaway, W.B., *Productivity and Technical Change*, Cambridge University Press, Cambridge.

Shapiro, C., & Stiglitz, J.E. (1984). Equilibrium unemployment as a worker discipline device. *American Economic Review,* 74(3) pp 433-444.

Stiglitz, LE. 1985. Equilibrium wage distributions. *Economic Journal*, 95(379), 595-618. Taylor, R.J., 2007. '*Technical Progress and Economic Growth'*, Edward Elgar, Northampton, MA, USA.

Solow, R.M., 1956. 'A Contribution to the Theory of Economic Growth', *Quarterly Journal of Economics*, 70pp. 65-94.

Solow, R.M., 1957. 'Technical Change and the Aggregate Production Function', *Review of Economics and Statistics*, vol. 39 pp 312-320.

Solow, R.M., 1960. 'Investment and Technical Progress', in Arrow, K.J., Karlin, S., and Suppes, P., (eds), 1959, *Mathematical Methods in the Social Sciences*, Stanford University Press, Stanford.

Solow, R. (1979). Another possible source of wage stickiness. *Journal of Macroeconomics,* 1(1)pp 79-82.

Taylor, R.J., 2007. '*Technical Progress and Economic Growth'*, Edward Elgar, Northampton, MA, USA.

Taylor, J. (2008) Organizational Influences, Public Service Motivation and Work Outcomes, *International Public Management Journal*, 11:1 pp67-88.

Taylor, J. and Taylor R. (2011) Working Hard for More Money or Working Hard to Make a Difference? Efficiency Wages, Public Service Motivation, and Effort, *Review of Public Personnel Administration*, 31:1 pp67-86.

Vandenabeele, W. (2007) Toward A Public Administration Theory of Public Service Motivation: An Institutional Approach, *Public Management Review*, 9:4 pp545–56.

Weiss, A. (1980). Job queues and layoffs in labor markets with flexible wages. *Journal of Political Economy*, 88(3)pp 526-538.

Young, A., 1992. 'A Tale of Two Cities: Factor Accumulation and Technical Change in Hong Kong and Singapore', in Blanchard, Olivier J. and Fisher, Stanley (eds), *NBER Macroeconomics Annual 1992*, MIT Press, Cambridge, Massachusetts, pp. 13-54.

Young, A., 1994. 'Lessons from the East Asian NICs: A Contrarian View', *European Economic Review*, vol. 38, no.3/4, pp.964-973.

Young, A., 1995. 'The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience', *Quarterly Journal of Economics*,110(3) pp. 641-680.

Yellen, J.L. (1984). Efficiency wage models of unemployment. *American Economic Review,* 74(2)pp 200-205.