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Panic and panacea: brain drain and science and technology human capital policy

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Abstract

Brain drain, the diffusion of skilled human capital, particularly scientific and technical human capital (STHC), from home to host country, is of concern to many nations. Traditional brain drain 'control' policies target the human capital embodied in a skilled individual. Based on a case study of brain drain panic in New Zealand in 2000, this paper explores new 'stimulation' brain drain policy approaches, including building research excellence and exploiting the diaspora, that take into account the situated and networked nature of STHC. Diaspora policies imply a reframing of 'national' STHC no longer circumscribed by geographic boundaries but by national affiliation.
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1. Introduction

> Nations increasingly view technology transfer as primarily a people-oriented phenomenon and fear they might lose their competitive edge in what seems like a global competition for skills. Immigration is thus, increasingly becoming an inseparable segment of national technology policies. (Mahroum, 2000)

Scientific and technical human capital (STHC) encompasses individual human capital characteristics but also includes social capital, "for knowledge creation is neither a solitary nor singular event" (Bozeman et al., 2001). From a policy perspective then, STHC is not of interest solely as an individual concept but also for its collective attributes. The diffusion of scientists and technologists from one research setting to another, including between nations, has significant policy implications.

'Brain drains' between home and host nations are perhaps the most widely recognised of demographic STHC diffusion trends. Even though it can take many guises, 'brain drain' as a phenomenon has been a common issue for debate in many countries around the world (e.g., Beine et al., 2001; Carrington and Detragiache, 1999; Kesselman, 2001). This paper will explore the 'brain drain' phenomenon as it relates to collective as well as individual STHC. Firstly the origins of the term 'brain drain' and its application will be canvassed. Whilst the reasons behind the human capital migration trends that underpin the brain drain are not new, the framing of the brain drain in relation to STHC has heightened its prominence at national

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levels and resulted in a variety of policy responses. Brain drain crises appear to engender a sense of urgency in political circles and society at large about the need for action to stem the flow of human capital, particularly expensively trained STHC.

The paper will then briefly outline a case study of panic around a perceived brain drain in 2000 in New Zealand. Of particular interest to STHC discussion is that the brain drain panic created a public environment ripe for a policy 'cure-all', a panacea to what was perceived as partly a STHC issue. The policies that were mooted in response, which were implemented in two distinct phases, a 'control' phase and a 'stimulation' phase, will have great ramifications for New Zealand's current and future STHC. In conclusion, the implications of such changes in policy for STHC development will be discussed.

2. The brain drain

The term 'brain drain' has come to be synonymous with the movement of human capital in which the net flow of expertise is heavily in one direction (Salt, 1997). The use of the word 'brain' pertains to any skill, competency or attribute that is seen as a potential asset. 'Drain' implies that this rate of exit is at a greater level than 'normal' or than might be desired. Linking the two implies the departure at an appreciable rate of the most talented (Bushnell and Choy, 2001).

The British Royal Society first coined the expression to describe the outflow of scientists and technologists to the United States and Canada in the 1950s and early 1960s (Cervantes and Guellec, 2002). During the following decades brain drain was characterised as a 'North-South', developing–developed country issue (Carrington and Detragiache, 1999). Concerns centred around the perception that the phenomenon was detrimental to the country of origin-the home country (Carrington and Detragiache, 1999), and the 1960s and 1970s debates concluded that brain drain was conditioned by political and economic imbalances in the world system (Portes, 1976; Lidgard and Gilson, 2001).

A scan of the use of the term in the media in 2001 showed that this version of the brain drain is predominant even though "the magnitude of the brain drain and more specifically of the emigration of scientists and engineers has always been difficult to assess, due to the lack of comparable statistics across different countries" (Meyer and Brown, 1999). In their study of migration of OECD nationals to the US, Carrington and Detragiache (1999) confirmed that five developed nations, the United States, Australia, Canada, France and Germany were the main host countries, accounting for 93% of total migratory flows towards OECD countries and that less developed countries remained highly represented in the home nations.

Whilst some of the more recent brain drains are said to have been caused by an oversupply of educated professionals such as in the IT field (a 'brain overflow') in home countries India and China (Lidgard and Gilson, 2001), in general the reasons for brain drains include the perceived prospect of better opportunities and quality of life in the host country coupled with the fact that immigration policies in the host countries tend to favour the more highly educated. These factors are not just attractive to skilled human capital in developing countries and, more recently, the discourse surrounding the brain drain has broadened to include migration of skilled human capital from smaller developed nations, such as Ireland and Canada, to larger, more economically powerful neighbours. The increasing outflow from developed home countries is said to be a "phenomenon that policy makers cannot ignore" (Carrington and Detragiache, 1999).

However, the language around the brain drain has been altering and the terms 'brain exchange' or 'brain circulation' have evolved as global competition for skills, coupled with intra-company transfers in globalised firms, mean that the flow of skilled migration is no longer uni-directional (Cervantes and Guellec, 2002). Morrison (2001) argued that this exchange migration is a 'circulation of the elite' with expanding opportunities for international work for the professions in stark contrast to the limited opportunities for less skilled human capital which is often 'trapped' in domestic or local labour markets.

'Brain return' is an inherent part of the brain drain debate, albeit a less visible part. In a significant study of brain return, Glaser (1978) showed that the commitment to return to the home country is very strong amongst high-level personnel working or studying abroad. Whilst many stayed away longer than they initially planned, they eventually returned to their

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