Research Policy 46 (2017) 327–336

Contents lists available at ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Distribution sensitive innovation policies: Conceptualization and empirical examples

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ARTICLE INFO

Article history:
Received 19 February 2016
Received in revised form
15 November 2016
Accepted 25 November 2016
Available online 4 December 2016

Keywords:
Innovation policy
Equity
Distribution
Growth
Science and technology

ABSTRACT

Innovation is essential to economic growth. However, it appears that the ways in which we pursue innovation *policies* generate economic inequities. In this paper, we explore policies that could be devised and employed with the aim of increasing growth while taking into account economic distribution. We call these policies distribution-sensitive innovation policies (DSIP). Following an exploratory theoretical approach, the paper focuses on a specific set of DSIP which are focused on particular groups of disadvantaged producers and consumers. We first categorize such programs into four types, and then employ a comparative approach to analyze existing programs in terms of these types, first, in our primary case study, Israel, and, then, using the United States, Germany, and Sweden as limited shadow cases to elaborate on the finding from our primary case. We conclude by arguing that although these programs are currently driven primarily by a concern for economic efficiency and not distribution, they show that our approach utilizing innovation policy to reach dual economic and social policy goals has potential for success.

1. Introduction

Inequitable distribution and economic disadvantage are increasingly contentious political issue in both developed and developing countries, and it is becoming a defining area of sociopolitical-economic debate. Yet even when the political will exists—which is certainly not a given—the use of traditional state instruments, primarily taxation and social welfare programs, faces political and economic limits (Pierson, 2001; Steinmo, 2002). For this reason, it is important to consider other state instruments that are rarely associated with distributive goals.

Policies that contribute to growth are seen as an unquestionable good. Innovation is essential to economic growth. However, economic growth could be uneven and leave many individuals, and groups, behind. Indeed, some see an inherent link between innovation and growing inequality. In contrast, we ask whether different ways to excel in innovation exist that can ameliorate inequities.

Accordingly, we inquire *whether and how science and technology and innovation policies can be an instrument of social policy to help address economic inequities—specifically, by supporting disadvantaged groups.*[1] To do so, we explore which policy programs are likely to achieve this goal and which disadvantaged groups they benefit. In addition, we look into the motivational and political underpinnings of such policies.

This paper is consciously explorative, and our scope is modest. We aim to show that theoretically DSIPs can further distribution-related objectives in at least four ways. The main objective of this paper is to focus attention on the social role that growth-creation policies could play in addressing economic disadvantages and to introduce what we believe are important theoretical pathways by which innovation policy could influence distribution. The depiction of such pathways is an essential first step in the introduction of metrics that would help future policy makers to assess the distributive impact of specific DSIPs. Such thinking is broadly aligned with studies centered on the concept of the 'social investment state': a state that strives to address social disadvantage, primarily by supporting its citizens' productive capacities and income (Gingrich and Ansell, 2015).

[1] S&T and innovation policy, as we use the term here, is government policy aimed primarily at driving domestic technological innovation (R&D), facilitation of domestic and local absorption of new technologies, and increasing the size and improving the quality of the S&T labor force.

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http://dx.doi.org/10.1016/j.respol.2016.11.007
0048-7333/

The list of DSIPs we develop is certainly not exhaustive, as our aim is only to demonstrate the merit of this endeavor and design theoretical principles around which a public debate could emerge. Accordingly, after our theoretical exploration, we take a case-study approach. First, we examine different examples of DSIPs in a single country—Israel, which is widely considered a current leader in innovation as well as a prime case of showing how success in innovation coexists with, and perhaps contributes to, different social inequities: high poverty rates, inequality and a widely held sense of social-economic exclusion. Then, given space constraints, we use considerably more limited 'shadow' studies of three other developed countries – the United States, Germany, and Sweden – to demonstrate that the Israeli-based observations could be generalized, at least within the already developed countries.

In this paper, we use a conceptual approach that focuses on how DSIPs affect specific disadvantaged groups as either producers or consumers of technology. The distinction between producers and consumers is fundamental for understanding the distributive impact of technology. With this approach, we identify at least four types of DSIPs that could improve the lot of disadvantaged groups. Moreover, numerous real-world examples of such programs exist across the developed world. Nevertheless, the distributive rationale for these programs is often not acknowledged, so, we lack information about their scope, modes of operation, and effect.

In what follows, we first explain how innovation and S&T policies, on the one hand, and economic disadvantage, on the other, are connected. We then discuss four different types of DSIP: i) supporting traditional industries; ii) directed at a specific disadvantaged geographic area or economic community; iii) targeting ascriptive groups (i.e., groups to which a person belongs by birth, such as women or ethnic group); and, iv) focusing on disadvantaged technology consumers (e.g., the disabled). To illustrate the motivation for establishing and operating such programs, we turn to a review of such DSIPs in Israel before briefly discussing the United States, Germany, and Sweden. We also present some evidence of the success of these programs. However, given the fact that governments do not systematically gather data and compile metrics concerning the distributive aspects of these programs—something we view as a major policy problem—this evidence is employed to suggest the distributive promise of the programs and should in no way be construed as an attempt at policy evaluation.

Our study's primary focus is on the distributive aspect of these programs – not their potential for inducing economic growth. Nevertheless, given that DSIPs success depends on their productivity-enhancing – not just their distributive – impact, we will briefly discuss our thoughts on this matter in the paper's conclusion.

2. Innovation, economic disadvantage, and DSIPs

Economic research on the effects of innovation uncovers a troubling state of affairs. Although for developed countries, technological innovation has become the main source of sustained economic growth, its economic impact is uneven and often excludes certain groups. One reason is that the application of new industrial R&D and its related innovations exacerbates economic hardship by replacing workers with machines. Accelerated technological innovation makes certain occupations irrelevant because new technology substitutes for human labor (Brynjolfsson and McAfee, 2012). While highly skilled workers are often viewed as the beneficiaries of accelerated innovation (see Acemoglu, 2002; He and Liu, 2008), among the 'losers', the share of workers considered low and medium skilled is high. In addition, studies dedicated to the influence that certain modes of financing exert on innovation, and the distribution of rewards within the corporate structure, present a disturbing picture: practices adopted to maximize stock value, such as stock buybacks, benefit stockholders but often channel corporate revenue *away* from investments in innovation (Lazonick and Mazzucato, 2013; Lazonick, 2014). No less importantly, the goal of share value maximization has all too often come at the expense of retaining workers in the firm. Workers, at all skill levels, face a considerably less stable working environment than did their counterparts a generation ago (Lazonick, 2009).

The standard policy response to economic disadvantage is unrelated to innovation policy; instead, it seeks to achieve redistribution by making taxes more progressive and to support the economically disadvantaged and socially excluded by increasing welfare programs. These responses are vital, but researchers in social policy often recognize the limits to increasing taxation rates and expanding the welfare state. High marginal tax rates might hamper economic growth in different ways, and, even more importantly, powerful interests mobilize effective opposition to such redistributive measures (Pierson, 2001; Steinmo, 2002).

Accordingly, we argue that governments wishing to address economic inequities (certainly not a ubiquitous goal) should also adopt measures that directly affect the market's allocation of income.[2] Indeed, several recent studies argue that different developed states have turned towards a "social investment state' model in which programs, such as education and training, that invest in fostering individual economic capacities – especially of the disadvantaged – are prioritized over 'consumption' programs (e.g., unemployment benefits) (Morel et al., 2012; Gingrich and Ansell, 2015). "Social investment" programs are motivated by both economic growth and social objectives such as reducing poverty. Thus, for example, increased government support for vocational training is likely to increase the productivity of program participants: something that would contribute to national aggregate economic growth and, concurrently, significantly boost the earning potential of individuals who might otherwise find themselves on the economy's margins. While the literature focuses on traditional social investment domains, for example Active Labor Market Policies, in principle, innovation policy could also be employed. Hence, we view DSIPs as a component of the social investment state alongside other supply oriented programs.

Given the critical role that technological innovation plays in economic growth and in the social distribution of resources, it seems reasonable to assume that S&T and innovation *policy* could be employed to influence economic disadvantage. Currently, S&T and innovation policy is geared almost exclusively to reaching the overarching goals of increasing domestic firms' international competitiveness, economic growth, and national security, but this does not mean that what is usually perceived as an economic and security policy could not be employed as a *social policy* as well.

Critically, the distributive aspects of S&T and innovation *policy* receive little attention. There is growing literature on inclusive innovation, also known as innovation for the global south. These scholars inquire how can innovation be applied to either alleviate problems acute in the global south (such as sanitation without running water), or reducing its cost to make it available to people living in low-income society. However, only a small body of work has emerged that addresses the distributive aspects of innovation policy, especially in the already developed world (Cozzens

[2] Education seems to be the one area in which such arguments have gained credence, however, one should be cautious not to overemphasize what schools can do and underestimate barriers other than formal education to economic advancement (Jencks, 1979; Labaree, 2012 Labaree, 2012). Moreover, 'skills' and 'education' while clearly related are not equivalent. Because skills are, to a great extent, acquired 'on the job', as part of a collective learning process. Simply increasing average education does not necessarily translate into a more highly skilled workforce.

et al., 2002, 2005; Oughton et al., 2002; Woodhouse and Sarewitz, 2007; Cozzens, 2010; Bozeman et al., 2011; Alzugaray et al., 2012; Cozzens and Thakur, 2014). This literature argues that the economic inequities arising from innovation are to a great degree the result of policy. It affirms that innovation is good, but policies formulated without concern for distributive outcomes can expand inequality. For example, public medical R&D funding in developed countries is rarely invested in "poor people's diseases," such as malaria, but tilted toward high-end medical technology targeted for diseases related to increasing wealth, such as heart disease (Bozeman et al., 2011). Existing works also set out to establish a conceptual framework in which innovation policy and equity could be evaluated. Cozzens and Thakur (2014) call attention to the types of jobs stimulated by different innovation policy packages: some are likely to increase inequality by creating only skilled, high-end jobs, while others create more inclusive employment opportunities that could also benefit low- to medium-skilled workers. This literature contributes by focusing attention on the "equity" deficit in innovation policy and outlining mechanisms through which innovation policy is associated with distribution. Nevertheless, there are still some gaps in our knowledge.

First, the existing work on the relationship between innovation policy and distribution is focused mostly on studies of the United States, on the one hand, and developing countries, on the other. To improve our understanding of this relationship in developed countries, other OECD countries should be considered. Second, these publications, important as they are, do not systematically present and discuss different types of DSIPs. We believe that there is a need for empirically-rich work that closely examines DSIPs: investigations that could shed light not only on the potential impact of such programs but also on the motivation for their establishment, their operation, political context, and actual impact. In what follows, we aim to close this important gap.

A fruitful approach to show the validity of DSIPs is to focus on how different innovation policies affect particular target groups either as producers or as consumers of technology. The producer-consumer distinction is at the core of the 'social investment state' concept. We argue that this distinction is fundamental for understanding the distributive impact of technology. Producers of technology (some of whom are innovators) are those who carry out research work or implement technologies to improve their output. Consumers of technology are those who utilize the goods or services produced as a result of innovation policy. For instance, on the producer side, when production activities move overseas, manufacturing jobs for new products tend to be generated abroad. Consequently, while profits accrue to the innovator, the broad-based societal benefits through job creation no longer occur in the same locality. On the consumer side, research products could have a differential effect on the economic status and quality of life for different income groups. Research on more cost-effective public bus transportation, for example, would disproportionately benefit individuals who cannot afford private transportation, as it is likely to reduce the price of a mode of transportation that is heavily used by low income groups.

On the producer side we pay special attention to the effects of policy on three target groups: low-skilled workers, disadvantaged ascriptive groups, and individuals from disadvantaged regions within countries. The main focus of the 'social investment state' perspective, is on the 'supply' side, accordingly the majority of DSIPs we discuss belong to this category. However, we argue that we should not neglect the consumption side. Therefore, we also study innovation's consumer side, in which many different groups of disadvantaged individuals could benefit from the development of specific technological products. We contend that DSIPs addressing economic hardship in these four target groups involve the following four program types.

First, policy could support technological innovation in directions that would create productivity gains for less-skilled workers.[3] Productivity gains, in turn, lead to higher incomes. This is also important because, in view of global competition from developing countries, the only way for developed countries, which have relatively high labor costs, to retain workplaces for low- and medium-skilled employees is to compete and grow through innovation. Therefore, government programs that focus on supporting innovation in industries with a high share of low- and medium-skilled workers should have significant positive outcomes in terms of creating a more inclusive economy.

Second, considerable inequalities arise among regions in a single country, determined largely by variations in the level of technological development. Hence, governments that aim to reduce inequality should examine the interregional technological divide. The goal of one type of DSIP is to support innovation in relatively disadvantaged *regions*.

Third, economically disadvantaged ascriptive groups are severely underrepresented in S&T occupations and high-tech industries, which tend to be associated with high incomes. DSIPs, in this context, should seek ways to increase the share of participation by ascriptive groups in technology-intensive industries as workers or entrepreneurs. The outcomes of such programs would not only directly advance the economic standing for those involved but also create important spillover effects for other members of the group.

Finally, all these groups, and numerous others, could be the target of DSIPs intended to enhance their ability to participate in the economy as consumers (Cozzens, 2010). In some cases, such innovations would lead to a direct monetary gain. For example, the production of less expensive visual aids for the vision impaired. In other cases, new technological products might have nonmonetary utility gains (e.g., development of musical instruments for the use of the physically disabled). In this paper, we focus specifically on the disabled as a target group because of the relatively high share (10–20%) of this group in the adult population (WHO, 2011, Table 2.1.: Disability Prevalence Rates.).

Clearly, the four DSIPs could, at times, overlap and complement one another. For instance, disadvantaged ethnic minorities are sometimes geographically concentrated in a backward geographical periphery. In such a case, DSIPs focused on promoting innovation in the periphery could also benefit the ethnic minority, and vice versa.

While the main emphasis in this study is on understanding the substantive form of DSIPs, we also seek to understand the factors that shape such programs. The limited literature on this topic suggests that DSIPs are of little concern to policy makers, in the United States and elsewhere. If this is indeed the case, then we should expect to find few examples of DSIPs. Even programs that could be described as DSIPs are expected to be established for non-distribution-related reasons. At the extreme, policy makers are unlikely to see the distributive aspects of these programs as a valid metric of their success, because they refuse to relate innovation policies to social policy goals.

[3] The emphasis here is on how innovation could increase productivity of low and medium skilled workers. However, innovation and organizational learning tend to be collective and cumulative processes that occur within the firm and could involve not only designated R&D professionals, but also shop floor workers. This implies that under certain circumstances (see Lazonick, 2007; Bessen, 2015) for a theorization of such social conditions), the relationship between lower skilled workers and innovation is reciprocal: on the one hand, innovation enhances their productivity and, on the other, these workers are integrated into the collective learning process that produces innovation.

3. DSIPs in practice: an exploratory case study

This section illustrates how DSIPs can be successfully employed, before discussing motivation and limitations to DSIPs by comprehensively analyzing one case study—Israel. We then complement our analysis with brief examples from the United States, Germany, and Sweden.

A series of successful innovation policies helped Israel transform from a country with one of the lowest levels of R&D intensity in the Western world in the 1970s to a world leader in R&D intensity with an economy highly dependent on new product-based ICT (Avnimelech et al., 2006; Breznitz, 2007). However, in parallel to this success, Israel changed from being the second-most-egalitarian Western society to the second most unequal. Currently one in five Israeli households lives below the poverty line as defined by the OECD (Brandolini and Smeeding, 2008; OECD, 2013). Furthermore, certain demographic groups were markedly left behind by the innovation-based growth: most notably, the Arab-Israeli community, which suffers from social exclusion and economic marginalization (Reiter, 2009).

S&T and innovation also play an important role in the United States, Germany, and Sweden, all of which—together with Israel—are in the top eight in the world in terms of R&D intensity. Indeed, since World War II, every new technology that became the basis for new industries originated in the United States (Weiss, 2014). Germany, with its network of Fraunhofer Institutes, is now widely viewed as a global leader in industrial R&D, and Sweden has the third-highest level of R&D investment intensity in the world but, unlike Israel, is still an egalitarian society. The three countries have varying degrees of economic inequality and economic exclusion and represent different paradigms of state intervention in the economy. However, the exclusion of minorities and political concerns about economic inequity are major challenges in all three countries.

In order to describe the DSIPs, understand the environment in which they were established and operate, and assess their success and limitations, we employed a range of qualitative methods. We analyzed government documents, followed newspaper coverage, and made extensive use of semi-structured interviews. Document analysis traced program evolution back to 2000 (i.e., fourteen years), although in some cases the period investigated was slightly longer. The interviews were conducted with policy makers (politicians and bureaucrats), program leaders, various stakeholders, members of target groups that participated in different programs, and policy experts in academia. During the period 2010-15, we conducted seventy-two interviews, of which forty-four were in Israel, eleven in the United States, nine in Sweden, and eight in Germany.

3.1. Supporting R&D in traditional industries

Traditional industries face challenges across the developed world—not least competition from countries with a relatively low labor cost. In Israel, such competitive pressures led major traditional industries, most prominently the textile industry, to decline considerably. In the 1990s, this contraction was overshadowed by a positive development in the Israeli economy: the rapid growth of a high-technology sector.

However, while Israel enjoyed rapid growth in high tech, the productivity figures for the rest of the business sector were either stagnant or negative (Trajtenberg, 2000, 2005). In the early 2000s, this growing tendency toward a dual economy led senior economists, together with officials at the Office of the Chief Scientist (OCS) in the Ministry of the Economy, Israel's main innovation policy agency, to fear that current policies were creating overreliance on one part of the economy—ICT. The danger of this overreliance was made clear in the aftermath of the dot-com crisis in the early 2000s (authors' interviews).

To correct this imbalance, in 2005, a new fund earmarked for the support of R&D in traditional industries was established within the OCS. The motivation, described in several interviews and later articulated in a national committee report, was macroeconomic stability and growth: the Israeli industry was in urgent need of diversification, and R&D support for traditional industries was critical in this regard (Committee, 2007). The problem was conceived as one of economic inefficiency, *not* inequity. Two years after the OCS started its traditional industries' fund, the Makov Committee was appointed to investigate the state of traditional industries, and found that worker productivity in them was more than 40% lower than in the United States or Europe mainly because of comparatively low R&D investment (Committee, 2007). As a result of the committee's recommendations, the budget of the OCS' traditional industries fund tripled, from 71 million shekels in 2006 to 236 million shekels in 2010 (though it fell to 184 million shekels in 2011) (Office of the Chief Scientist, 2012).[4] In addition, the OCS subsidized 75% of the cost of 200 consulting hours per company, to help in grant applications.

This last measure addresses the problem of lack of R&D knowledge. While a typical high-technology start-up often applies to the OCS the moment it is formed, traditional industries' companies many times not only not invest in R&D, but also underestimate its value, are unaware of the OCS' programs, and are unsure about how to put together a viable grant proposal. Indeed, one of the main objectives of the program is to raise awareness among traditional industries of the value of R&D and the role of the OCS in securing funding for this purpose (authors' interviews).

The OCS has also recognized that traditional industries could benefit by working with successful high-tech firms. Establishing 'traditional-high tech' industry ties could both enrich the organizational learning process of the traditional industries and open new avenues for collaborative technological innovation. However, despite the OCS's wish to nurture such collaborative ties, our interviews with traditional industry managers involved in the OCS program, indicate that, at least for now, 'traditional- high-tech' ties are still the exception, not the rule.

The traditional industries program is considered a high priority for the OCS. Naftali Benet, the former Minister of the Economy (2014), stressed in a public address that because of the program's importance, all good proposals will be approved and funds for traditional industries grants will not be capped

Further, Benet presented a distribution-based reason for the program, which is quite different from the official economic diversification justification. Stating that inequality is Israel's biggest problem and that more than half of all workers earn less than 6000 shekels per month, he argued that infusing R&D into the traditional industries is a way to address it (Benet, 2014). Similarly, when interviewed, the head of the program explained his motivation:

> You see a different world, different people. Real people who work hard, long hours, long shifts; otherwise, the pay is too low—so they work 12 hours a shift. Nobody is really interested in them—that's what I felt. This really moved me in contrast to others [at the OCS] who care more about the technology side of things. This is "real" to me, and I think it is important that the chief scientist is involved in this. (Authors' interview)

Accordingly, although distributive concerns have not been the driving force behind the program, it appears that they do play a role in its implementation.

[4] The Shekel – Dollar exchange rate fluctuated over this period at around 4:1.

The program has been in operation for ten years, and some "success stories" suggest positive effects. For example, Rav Bariach, a long-standing manufacturer of security doors, used this program to move from being on the verge of bankruptcy in 2008 to renewed international success in 2014. Revenues increased from 90 million shekels in 2009 to 300 million shekels in 2014. The number of workers increased from 170 to 440, and productivity increased. According to the company's chief executive officer (CEO), the main reason for this dramatic turnaround was the injection of much needed R&D and the changes this created in the company's manufacturing process and products. In 2008, the company employed only a single engineer; in 2014, forty-four engineers were on its payroll. The OCS was instrumental in bringing about this change by extending six R&D grants to the company (Orpaz, 2014).

In five interviews with other traditional industry companies that received grants from the OCS, similar stories emerged about technology breakthroughs. An increase in the number of engineers occurred at these companies, but even more interesting, from a distribution perspective, was that the number of production workers in OCS-supported projects grew, and plans were in progress to increase their number further. This is far from trivial during a period of global recession in a sector in which the overall number of workers is declining. Nonetheless, the wage effect for production workers was unclear: either interviewees were unsure or they did not wish to share wage-related information.

3.2. S&T in the periphery

The problem of inequality between the periphery and the core persists in all OECD countries. In Israel, the center of the country, especially the Tel Aviv metropolitan area, is relatively affluent. However, the Galilee region in the north and the Negev in the south are characterized by low income and high unemployment. Ever since the country's independence in 1948, an important pillar of government economic policy has been to promote economic growth in the periphery using a range of policy instruments, such as incentivizing private firms to establish plants in the periphery, offering tax deductions and subsidies to periphery-based firms and founding state-owned enterprises. Such policies are motivated by both social concerns – reducing disadvantage in the periphery primarily – and by the economic objective of growing the economy through development of untapped potential in the periphery.

S&T and innovation policy, in this context, is manifested in two central ways. First, using an existing law incentivizing FDI directed at manufacturing branches opening in the periphery, the OCS won approval to grant "approved factory status" to all science-based firms in the periphery since 1974. Second, since the early 1990s, the OCS technological incubator program has intentionally located most of its incubators in the periphery.

But not all activities at technology-based firms are technology-intensive. Government must take into account that, in effect, it might be supporting low-skilled activities at high-technology firms (e.g., assembly lines). Although this is likely to boost employment, it does not necessarily create quality workplaces or drive productivity gains. Indeed, these concerns led the OCS to change some of the conditions attached to branch openings in the periphery. For example, the officer in charge of these programs recounted, during an interview, that in 2010, when the OCS launched a program to incentivize telecommunication firms to relocate to the periphery, the program was devised specifically to attract engineers to work and live in the south, not simply to boost employment. Under the conditions of this program, firms are guaranteed significant subsidies (tens of millions of shekels per annum) for three years, on condition that they relocate not only their operations to the south but also their workers. This requirement arises from the supposition that this relocation will ensure the creation of high-quality jobs as well as exert a positive effect on local consumption, education, and civic involvement (authors' interviews). However, many within the OCS, including several former chief scientists, view the emphasis on the periphery as more of a political concern foisted open the OCS that should be disregarded (authors' interviews).

Nonetheless, the expenditure share of the OCS R&D fund dedicated to companies in the periphery grew extremely rapidly: from 4% in 2001 to 32% of the OCS's budget in 2011. This eightfold growth is explained by the establishment of both the OCS traditional industry program (most traditional industries are located in the periphery, hence the traditional industry program complements DSIPs targeted at disadvantaged regions) and the special fund (around 100 million shekels per annum) for large firms in the periphery (Office of the Chief Scientist, 2012). In addition, OCS grants are ten percentage points higher for firms in the periphery (e.g., 60% of a project's R&D costs, instead of 50%).

The second major component is the OCS's technological incubator program. Technological incubators offer start-up firms financial support, administrative services, physical space, consulting services (e.g., marketing), and networking possibilities. The Israeli model, launched in 1990, is widely considered a success story (Frenkel et al., 2008).

While the contribution of technology incubators to the success of the Israeli high-technology sector is often highlighted, the social role that the incubators play is not as well known. The majority of the incubators (fifteen out of twenty-four) are located in the periphery on purpose. One of the original goals of the program was to encourage economic growth in the periphery and to help absorb the large numbers of high-skilled immigrants from the former Soviet Union (Breznitz, 2007). Whatever the initial motivation, there is little doubt that the incubator program diminishes—somewhat—the inequality between the center and the periphery (Avnimelech et al., 2007). At the same time, the same study also found that the incubator program's success in permanently (i.e., ensuring that firms remain in the periphery after graduating from the incubator) attracting technology-based economic activities to the periphery is admittedly low. With regard to incentivizing large high-tech firms to invest in the periphery, a study looking at Intel's Karyat Gat plant (which received the biggest investment subsidy given to any company in Israel since independence) suggests that government support for Intel benefited the region in terms of income, employment, and other spillover effects, such as bolstering the local education system (Shachar et al., 2005).

3.3. S&T policy for disadvantaged minorities

Ascriptive groups that are economically disadvantaged are also severely underrepresented in S&T occupations and high-tech industries. In 2008, 8.3% of Arab-Israelis were unemployed, compared with 5.8% of their Jewish compatriots, and their average monthly income was 30% lower (Ministry of Industry Trade and Labor, 2010). Arab participation as producers in R&D and high-technology sectors is even more marginal. The share of Arabs in high-tech sector employment in 2003 was only 1.3% (Central Bureau of Statistics, communication with authors December 2014), but they represent a 20% share of the general population. A decade ago, Arab technology-intensive firms were essentially nonexistent.

Policies aimed at rectifying this situation can be divided into those that focus on labor market participation and those that aim to stimulate entrepreneurship. An important example of a program intended to bolster Arab employment is government wage subsidies for firms that employ five or more Arab workers. The subsidy equals about 25% of the Arab employee's wage for thirty months (Ministry of Industry Trade and Labor, 2012). The number of employees enrolled in this program expanded considerably from 266 in 2010 to 2252 in 2013 (Ministry of Economy communication

with authors, February 2014). Although the program is not exclusively tailored for technology-oriented employment, according to the director of the Authority for the Economic Development of the Minorities Sector in the Israeli Prime Minister's Office, it plays an important role in promoting Arab employment in these industries. For example, a major reason that Amdocs (Israel's biggest software company) opened a development plant in Nazareth in 2013, employing about 200 workers, was to take advantage of these wage subsidies (2014).

Another such program that targets future labor market participation is a 300-million-shekel fund (to be spent over six years) created by the Israeli Council for Higher Education intended to support Arabs in academia. One of the main programs sponsored by the fund involves scholarships for Arab students who enroll in "high-priority" courses. S&T programs are especially welcome given the future labor needs of the Israeli economy and the high likelihood of finding a high-income position as an engineer (Vatat Professional Committee, 2013).

Although the government is active with regard to Arab placement in technology-intensive industries by partnering, and contributing to funding, program operation is left exclusively to nonprofit organizations (most prominently Tsofen, Maantech, and Kav Mashve). The focus is mostly on job training in computer engineering, gathering and disseminating information on job openings, and helping applicants prepare their résumés and coaching them before job interviews. In addition to their activity on the supply side, these organizations also interface with high-tech firms in order to raise awareness regarding the benefits that accrue from employing Arab engineers and the cultural adaptations required for successful employment.[5]

On the side of high-tech entrepreneurship, government support began in 2000 with a decision to establish a technological incubator in Nazareth, the town with the largest Arab population. The incubator was operated by a private company headed by an Arab CEO, but 85% of grant funding for the incubator's member firms comes from the state. From the very start, the incubator was criticized within the OCS for its ethnic focus. Critics argued that ethnicity should not factor into grant decisions. Indeed, the Nazareth incubator does not use ethnic origin as a selection criterion to screen applicants, and, accordingly, many of its companies are managed by Jews. Nevertheless, because of its location, many of its member firms are owned and managed by Arab-Israelis. Moreover, the incubator's focus on pharmaceuticals and medical devices draws from the fact that Arabs tend to concentrate professionally in medicine, rather than other scientific fields (authors' interviews). Since its establishment, the Nazareth incubator has hosted 27 different firms.

In addition, the OCS has recently launched a new program dedicated to the support of Arab high-tech entrepreneurship, in which the OCS contributes 35% more than the maximum for its regular program. However, even with the incubator and the new OCS program, policy is lagging in the area of entrepreneurship in comparison to labor market participation: support for S&T producers is more well-established than support for innovators.

In terms of motivation, the growing government interest in Arab high-tech employment and entrepreneurship is predominantly based on an economic imperative. In countless public statements, senior civil servants, ministers, and even prime ministers have emphasized that Arab employment and entrepreneurship in knowledge industries benefits not only Arabs but also the economy, which is suffering from a shortage of qualified labor.

In terms of outcomes, DSIPs targeting the Arab population are in their early stages, hence, they are difficult to assess. Some programs have been studied and show promise.[6] Overall, while Arabs still constitute a small minority of high-tech workers, the share of Arab workers in the high-tech industry continues to increase: it doubled from 1.3% of workers in 2003 to 2.6% in 2011 (Central Bureau of Statistics communication with authors, December 2014). Moreover, most of our Arab interviewees believed that the general trajectory was positive and significant.

3.4. DSIP for the disabled

In all developed countries, the physically disabled are a prominent "special needs" group that is the target of numerous government programs.[7] However, until 2011 no specific innovation policy in Israel targeted the disabled.

In 2011, the OCS established a program dedicated to the support of technological innovation that would aid disabled individuals to achieve functionality in their daily activities (Office of the Chief Scientist, 2012). The program's budget was fixed at 6 million shekels per annum, and—unlike other OCS programs—nonprofits are encouraged to apply for funds. Grants for commercial firms cover 65% of R&D costs while for nonprofits the figure is 85%. OCS grants are extended to the development of tools that are likely to improve the quality of life for disabled individuals as well as help integrate them into the community. For example, Milbat, a nonprofit, received 600,000 shekels to develop a "smart" walker with electronic sensors that transmit data tracking movement in someone undergoing rehabilitation after an injury. This data is to be used to inform future walker practice sessions for the monitored individual in the hope of accelerating the rehabilitation process (authors' interviews).

The bar for OCS funding in this program is noticeably lower than it is for firms that apply for grants from the general R&D fund. First, unlike all other OCS' programs, the technology supported does not have to be novel—only its application to the problems faced by the disabled. Second, while the applicant was required to demonstrate both technical feasibility and benefit to the disabled, the OCS does not require proof of market viability. Indeed, economic concerns are subordinated to social ones in the management of this program. Even if the OCS estimates that the firm is unlikely to become profitable, it might still extend funding so long as disabled individuals stand to benefit from the product's development (authors' interviews).

The program was entirely the initiative of officials in the OCS (and approved by the Ministry of Finance) and is conceived of as a social program—not an economic one. However, the program's non-economic rationale could also explain its marginality. Not only is its budget extremely limited but so are applications. Demand for program grants is so low that, to date, OCS annual spending has yet to reach even 6 million shekels. It appears that very few Israeli organizations innovate in this field, and the market is not sufficiently lucrative to attract new entrants.

4. DSIP in other countries

The Israeli case study is highly informative because distribution-sensitive innovation policies are relevant in an economy character-

[5] For example, by making company interviewers aware that Arab interviewees' tendency to avoid eye contact with the interviewer is a sign of respect, not lack of confidence or trustworthiness.

[6] For example, a recent government evaluation found that in a program focused on training and placement of Arabs in technology-intensive sectors over 80% of participants viewed the program as helpful, and more than 60% of them managed to find a job through the program (Lis-Ginsburg and Porat, 2014).

[7] In 2013, approximately 800,000 people in Israel had disabilities severe enough to impair their everyday functioning.

ized by numerous and significant concentrations of disadvantage whose main growth engine is the high-tech industry. In this subsection, we briefly describe our finding of domains of DSIPs in Sweden, Germany, and the United States. We begin with a presentation of the producer analytical category dedicated specifically to the low-skilled, periphery and ascriptive group targeted programs. This is followed with a brief investigation of the consumer category focused on the disabled. Space constraints do not allow for full descriptions of these DSIPs. Nevertheless, our goal here is different: demonstrating that such programs are not unique to Israel as well as highlighting several differences and similarities across countries.

4.1. Producer-oriented DSIPs

The fact that without innovation traditional industries are unable to compete with the cheap labor cost of developing economies is well understood. For example, in several interviews in Sweden, we found that the joint industrial committee, which includes both employer and union representation, plays a critical role in shaping S&T and innovation policy. This is important because it offers a policy venue in which the interests of traditional industries (which in Sweden are highly organized and powerful) lobby intensively for public R&D support. In an interview, the chief economist of the metal union stated specifically that the Swedish unions understand that the future of their industries depends on continuous innovation (authors' interviews). A similar dynamic was seen in Germany. Indeed, much of the public spending on innovation in both countries is focused on infusing new technologies and innovation into existing industries and firms. This is almost the opposite to the state of affairs in both the United State and Israel, where until recently innovation policy has been focused on the creation of new industries and companies.

American unions, which differ greatly from those in both Sweden and Germany, are generally quite weak and are not involved in the shaping of S&T and innovation policy (authors' interviews). Until recently in the United States, traditional industries were mostly an afterthought among federal innovation policy makers. A comparison of the Swedish and American cases suggests that the preferences and identity of "insiders" are critical factors in shaping DSIPs, as was also true in other areas of social policy (Rueda, 2005).

However, further comparison suggests that they are not the only factors. In the Israeli case, we find that the rationale for renewed public support for innovation in traditional industries is the imperative for economic diversification. Interestingly, in the United States, as part of policy reorientation after the financial crisis of 2007, innovation-based manufacturing policy has gained prominence as a critical component of American long-term economic competitiveness. Thus, such policies are motivated largely by both "voice" and different conceptualizations of economic imperatives. Distributive concerns, however, were rarely voiced as a motivation in any of the four countries.

Unlike DSIPs in traditional industries, support based on economic-geographic criteria is associated with well-established industrial policy practice in different countries. The European Union (EU) has been a leading organization in linking distribution, industrial, and innovation policies, with respect to regions, even if actual implementation of these ideas is lagging (Braczyk et al., 1998; Morgan and Nauwelaers, 1999; Oughton et al., 2002; Garretsen et al., 2013). Nonetheless, interviews in Washington, DC, and Stockholm revealed that policy makers in innovation either claim that, in general, innovation policy is unconcerned with narrowing region-based inequalities (United States) or acknowledge such considerations but view them as an external imposition foreign to the world of innovation policy (Sweden). However, German interviews, like those in Israel, revealed a different picture. Public support for S&T innovation in relatively backward *Länder* was viewed as a high priority by the government, especially in light of German reunification and the political imperative of closing the gap between the eastern and western parts of the country (authors' interviews).

In sum, perhaps as an extension of long-standing general economic policy legacies, innovation policy is at times explicitly distribution sensitive with respect to regional inequalities. Nevertheless, such an egalitarian orientation is far from universal or, as our interviews in Sweden and Israel revealed, welcome among many policy makers even where it is practiced.

From a producer point of view, DSIPs could also be employed in different countries to benefit disadvantaged ascriptive groups. However, unlike in Israel, in the United States, Germany, and Sweden our survey failed to find evidence of a concentrated government effort to integrate disadvantaged minorities in the high-tech sector or to promote technological entrepreneurship in these populations.[8] However, in Germany, advancement for women, specifically employment in R&D activities, is a central federal policy priority. An important institution in involved in this effort is the Center of Excellence Women and Science (CEWS). CEWS was established in 2000, with the goal of increasing the share of women in leadership positions at universities and research facilities, the efficiency of gender equality programs, and gender awareness in all fields of science and research (BMBF, 2011). Our interviewees in Germany all agreed that government efforts to advance women's employment in S&T in academia and in business are both continuous and intensive. These efforts are generally driven by the underrepresentation of women in these fields and a more general sociopolitical interest in Germany in gender equality. Interestingly, no equivalent effort exists to integrate disadvantaged minorities. Thus, while in Israel considerable effort is made to promote minorities in S&T, but not women, the opposite is the case in Germany.

4.2. Consumer-oriented DSIP

Government support for the technological development of products to aid specific disadvantaged populations is mostly haphazard. For instance, governments fund research that is likely to help address health-care concerns that are overrepresented in disadvantaged populations. In the United States, for example, government efforts to develop treatments for those suffering from type 2 diabetes will disproportionately benefit African-American women, who suffer from the disease at a rate far higher than that of the population at large. However, the support of African-American women is coincidental in this case.

Nevertheless, some government programs are explicitly dedicated to the development of technologies that would assist specific disadvantaged groups. One example of this is the Swedish Institute of Assistive Technology, which for several decades has sponsored the development of new assistive technologies for the disabled and the elderly. The motivation, as in Israel, is not economic but social: the disabled suffer unequal opportunity in society and tailor-made technologies help to narrow the gap (Hjälpmedelsinstitut, 2014).

4.3. Motivation, context and effect

In sum, our shadow cases demonstrate that DSIPs are viable in a broad range of political environments. Accordingly, we view DSIPs as a rich field for policy action and future research. Moreover,

[8] Although efforts on the education front (e.g., increasing the share of American women who major in S&T) do exist.

our cases studies offer several insights concerning the motivation, political context and effect for DSIPs.

First, in terms of *motivation*, the development of some programs was motivated by social, perhaps even egalitarian, concerns. This is clearly the case for government-sponsored technological innovation for the disabled in Israel and Sweden. However, by far support for DSIPs that focus on specific disadvantaged groups is a byproduct of attempts to achieve national economic goals. Most of the times, policy makers are oblivious to the distributive implications of policy. This is clearly the case with the programs that support Arab minority integration into S&T firms in Israel: these programs are motivated by a desire to make a large highly-educated population economically productive to strengthen the *general* economy. Similarly, programs that promote innovation in traditional industries in both Israel and the United States were designed for the purpose of economic renewal, and only later, after the social impact became clear, did inequality-decreasing outcomes become part of the discourse.

Regional policy is in a gray area in this respect. Egalitarian objectives are sometimes expressed in the context of interregional DSIPs. DSIPs constitute an extension of traditional industrial policy that often aims to reduce regional differences. This is expressed most clearly in the distributive politics in large federal systems such the EU or the United States. However, as we have seen in Israel and Sweden, a similar political rationale operates even in small states. Nonetheless, in other instances, the motivation for these programs is framed in terms of economic growth: public S&T support for backward regions is justified by the economic benefits that will materialize due to the technological upgrading in these regions.

A comparison of Israeli programs with counterparts in other countries highlights the significance of the *political-economic context* for the development of a distribution-sensitive orientation. First, the United States stands out as a DSIP laggard. One reason for this is that American policy makers are less concerned about redistribution than their counterparts in most other countries. In general, in the United States, egalitarian considerations have a comparatively lower priority (Sachweh et al., 2012). However, an international comparison regarding DSIPs for traditional industries highlights a different factor: in the American political economy the room for union-driven policy making is very limited. In Sweden and Germany, unions are integrated into the decision-making process—making them "insiders" in the neocorporatist governance arrangement. Given that unions in traditional industries are relatively well organized, union participation in decision-making in the neocorporatist countries implies a high likelihood that traditional industries will be seen as part of the innovation policy agenda. This state of affairs is largely in line with the Varieties of Capitalism literature that postulates that in Coordinated Market Economies worker involvement in corporate governance is far greater than in Liberal Market Economies (Hall and Soskice, 2001).[9]

In contrast in Israel, the support for traditional industries derives not from union power/intervention but from government concern with economic diversification. Further, the renewed interest in manufacturing in the United States demonstrates that voice and a seat at the table might not be the only decisive factor. Nonetheless, it is clear that interest group power is relevant for understanding the scope of DSIPs.

Policy is shaped not only by political actors but also by professional debates among policy experts. First, as mentioned above, distributive concerns are often not part of the innovation policy discourse. Yet even when they are, some policy experts question whether social purposes are either desirable or practical in S&T and innovation policy. For some experts, innovation policy is exclusively about economic growth, competitiveness, and national security. Redistribution, they argue, might be appropriate in education and social welfare but not in S&T.[10] Others fear that DSIP innovation policy will simply fail, as they see it as just another example of "bad old industrial policy," in which the state takes it upon itself to support *specific* industries/groups/regions without the knowledge required to do so successfully. Instead, the argument goes, governments should stick to "horizontal" policies that provide infrastructure and do not privilege one type of actor/sector over another (Teubal, 1997; Rodrik, 2008; Wade, 2012; Pack and Saggi, 2006). The degree to which these policy experts have the upper hand in policy debates depends on the more general inclination of the government in a specific country to engage in industrial policy.

Finally, despite the qualitative evidence that DSIPs are successful, we know relatively little about the *effect* of DSIP programs for two reasons. First, most of these programs have a relatively short track record and the effects of innovation policies are in the medium and long term. Second, and more importantly, governments do not systematically gather the kind of data, both qualitative and quantitative, that would allow for full evaluation of these programs. The main reason for this is that when these policies are conceived, they are not seen as having distributive goals, therefore, relevant measurement efforts do not exist.[11]

5. Conclusion

The main objective of this study is to introduce DSIPs as an important new tool that aims at the same time to increase both growth and equity and, hence, could be a critical part of the social investment state. Programs of this type have the potential to level the playing field where it is most uneven: science, technology, and innovation.

In this article, we focused on the effects of innovation on specific groups of technology' producers and users and discussed four different archetypes of DSIPs: innovation in traditional industries, geographical-economic peripheries, disadvantaged ascriptive groups, and the advancement of disadvantaged consumers of technology.

If one eschews any state intervention for redistributive purposes, DSIPs are obviously negative instruments. However, even for egalitarians, DSIPs are not necessarily positive. Some commentators are skeptical about government's use of growth-creation policies to advance social goals. This, as mentioned above, is related to a general critique of industrial policy. The argument is tied to the view that government is unable to successfully pick winners. However, as many point out, this rationale applies equally to other policy fields—education, health care—in which there are far fewer reservations about government intervention (Rodrik, 2008). The question is, in truth, one of *how* to intervene. Answers to

[9] However, as Lippert et al. (2014: chapter 8) show in a comparison of the automotive industry in the U.S., Germany and Sweden, the place of worker voice in corporate governance is shifting in these countries – sometimes in opposite directions.

[10] It is certainly possible that there is a trade-off between distributive and economic growth objectives in the design of policy. However, such a trade-off does not imply that economic efficiency concerns should always trump distributive ones. As is true of other policy fields, how to manage trade-offs should be the subject of informed public debate. Moreover, in many instances, distributive and growth objectives might actually be associated with one and the same policy. As argued above, Israeli DSIPs for traditional industries and the Arab minorities are first and foremost driven by economic concerns.

[11] For example, governments wishing to assess the distributive impact of traditional industries DSIPs should gather longitudinal qualitative and quantitative data on low-skill labor employment and income in firms that receive support. It is important to note that within the context of innovation policies this issue is salient whenever trying to measure the outcomes of innovation policies in achieving the general goal of economic development (Feldman et al., 2016)

this question could be arrived at only following intensive engagement with the question of what constitutes good DSIP practice, and such engagement depends largely on large-scale longitudinal policy experimentation coupled with systematic policy evaluations. Laying out theoretical pathways that link innovation policy to distributive outcomes—whether less or more equitable (e.g., support of high technology vs. traditional industry innovation)—is a prerequisite to formulation of indicators for the assessment of innovation policy's distributive effects. As DSIPs develop, a crucial part of these studies should clearly articulate the causal mechanisms leading from policy efforts, to outputs, to the desired outcomes, and not mistakenly confuse outputs, for example, more minority STEM (science, technology, engineering, and math) graduates, with the desired outcome, for example, more minority high-tech entrepreneurs. We view this avenue of future research as extremely promising. Specifically, we see a lot of promise of cross-fertilization with the EU recent efforts to develop mixed-method indicators for regional development, which take into consideration the significant differences in basic conditions and aspirations.

Those who view the emergence of DSIPs in a positive light are those who see economic exclusion as a problem that should be dealt with by adding new policy instruments to the traditional arsenal of the egalitarian policy maker. It is worth pointing out that even existing DSIPs are in no sense well established. As discussed above, the push for DSIPs is in most instances driven by nondistributive concerns. This matters because programs established for reasons other than distributive purposes could be designed in ways that do not optimally advance distributive objectives. Moreover, insofar as these programs are not recognized as DSIPs, they are unlikely to attract support from actors – for example left wing parties and egalitarian social movements – interested in advancing those goals. Indeed, in all four countries studied we were surprised to discover that the salience of distribution issues surrounding innovation policies is low. Political struggles (e.g., between right and left) involving the distributive orientation of DSIPs are basically non-existent due to the fact that DSIPs are rarely viewed in a social context – even by prospective proponents. As a result, the sociopolitical support behind them is weak, and, in some cases, DSIP programs are terminated, or not established in the first place, due to lack of support.

The social impact of the three producer-oriented DSIPs discussed above is primarily driven by the productivity growth they are anticipated to generate among the disadvantaged. Although the main focus of this paper is on the social goal of this program, we believe that these programs could also help accelerate economic growth in general. First, precisely because these programs focus on integrating the economically marginalized – in terms of people, sectors and regions – into the technology intensive world, the untapped economic potential is considerable.[12] Second, the identity and composition of the actors involved in innovation matters greatly. Agents that bring to the table new perspectives and objectives (e.g., minorities or traditional industries) are likely to vitalize the innovation process, leading to productivity growth downstream. Given the understanding that innovation is a cumulative and collective process, new actors introduced into the innovation process are more likely to succeed to the extent that they are integrated into extant structures and networks: something that DSIPs could facilitate.

Nevertheless, optimistic scenarios concerning the general productivity enhancing potential of DSIPs should take into account not only possible weaknesses of these programs, but also the degree to which their success depends on the broader policy environment. Thus, for example, DSIPs economic potential depends on corporate governance that prizes long-term investment in workers: investment that enables the collective and cumulative process of organizational learning and innovation (Lazonick, 2013). Conversely, corporate governance that views firms solely as financial assets to be maximized, will compromise the economic good that DSIP programs could achieve.

In sum, we argue that it is vital for those who care about social equity—whether policy makers, academics, industry stakeholders, or the informed public—to seriously consider DSIPs as a new tool within an effective social investment regime. Well-designed DSIP programs could prove an important component of future efforts. However, if we do not recognize them as potential options in that context and allow extensive policy experimentation, their promise will never be fulfilled.

[12] Clearly, not all 'potential' could be tapped and exploited. DSIPs investment decisions must be guided by realistic analyses of the specific target population's social and economic potential. For an example, see Farole et al.'s (2011) discussion of how the EU Cohesion Policy should be employed to support innovation in disadvantaged regions.

Acknowledgments

The authors thank Maryann Feldman, Robert H. Cox, David Art, Mark Zachary Taylor, Petri Rouvinen, Michael Piore, Susan Cozzens, Matthew J. Higgins, Marie Thursby, Henry Sauermann, Joseph Wong, Yotam Margalit and Julia Lane for detailed remarks on numerous versions of this paper. Two anonymous reviewers helped make this paper a much better one and we humbly thank them for their insights. We also thank Erica Juergensen, Shira Bergman, Noam Galili, Noa Gani, and Adi Meiri for superb research assistance that went above the call of duty. This paper was presented at the OECD-Inet annual conference in Paris in April 2015, and we thank the participants for their comments, especially Brian Kahin, Andrew Wyckoff, Dominique Guellec, William Janeway, Jim Balsillie, Catherine Mann, and Rohinton Medhora. The intellectual envirnomnent of the SSHRC's partnership project Creating Digital Opprtunities run by David Wolfe served as a warm home in which to develop the final verison of this paper. This research was supported by a gift from the Canadian Friends of Tel Aviv University , a grant from the Israel Science Foundation (ISF grant # 959/15 and a grant from the United States-Israel Binational Science Foundation (BSF grant # 2008305), Jerusalem, Israel. We are also extremely grateful for the generous intellectual and financial support of the Kauffman Foundation. The views presented in this paper are solely those of the authors, and so are all the errors.

References

Acemoglu, D., 2002. Technical change, inequality, and the labor market. J. Econ. Lit. 40 (1), 7–72.
Alzugaray, S., et al., 2012. Building bridges: social inclusion problems as research and innovation issues. Rev. Policy Res. 29 (6), 776–796.
Avnimelech, G., Teubal, M., 2006. Creating venture capital industries that Co-evolve with high tech clusters: insights from an extended industry life cycle perspective of the Israeli experience. Res. Policy 35 (10), 1477–1498.
Avnimelech, G., et al., 2007. Entrepreneurial high-tech cluster development: Israel's experience with venture capital and technological incubators. Eur. Plan. Stud. 15 (9), 1181–1198.
BMBF, 2011. Frauen Im Wissenschaftssystem, Retrieved from http://www.bmbf.de/de/494.php (October 17, 2014).
Benet, N., 2014. Speech in Traditional Industries Conference.
Bessen, J., 2015. Learning by Doing: The Real Connection Between Innovation, Wages, and Wealth New Haven. Yale University Press.
Bozeman, B., et al., 2011. Inequality in the distribution of science and technology outcomes: a conceptual model. Policy Sci.
Braczyk, H.-J., et al. (Eds.), 1998. Regional Innovation Systems: The Role of Governances in a Globalized World. UCL Press, London.
Brandolini, A., Smeeding, T.M., 2008. Inequality: International Evidence. In: Blume, L.E., Durlauf, S.N. (Eds.), New Palgrave Dictionary of Economics. Palgrave Macmillan, London.
Breznitz, D., 2007. Innovation and the State: Political Choice and Strategies for Growth in Israel, Taiwan, and Ireland. Yale University Press, New Haven, CT.
Brynjolfsson, E., McAfee, A., 2012. Race Against the Machine: How the Digital Revolution Is Accelerating Innovation, Driving Productivity, and Irreversibly

Transforming Employment and the Economy. Digital Frontier Press, Lexington, MA.
Committee, M., 2007. Report of the Committee for the Evaluation of the Means to Empower the Periphery and Traditional Industries (in Hebrew). Ministry of Industry Trade and Labor, Jerusalem.
Cozzens, S., Thakur, D. (Eds.), 2014. Edward Elgar, London.
Cozzens, S.E., et al., 2002. Evaluating the distributional consequences of science and technology policies and programs. Res. Eval. 11 (2), 101–107.
Cozzens, S.E., et al., 2005. Distributional effects of science and technology-based economic development strategies at state level in the United States. Sci. Public Policy 32 (1), 29–38.
Cozzens, S.E., 2010. Innovation and inequality. In: Smits, R.E., Kuhlmann, S., Shapira, P. (Eds.), The Theory and Practice of Innovation Policy: An International Research Handbook. Edward Elgar, Cheltenham (UK).
Farole, T., et al., 2011. Cohesion policy in the european union: growth, geography, institutions. J. Common Market Stud. 49 (5), 1089–1111.
Feldman, M.P., Hadjimichael, T., Kemeny, T., Lanahan, L., 2016. "The Logic of economic development: a definition and model for investment.". Environ. Plan. C: Govern. Policy. 34, 5–21.
Feldman ea al should be inserted hereFrenkel, A., et al., 2008. Public versus private technological incubator programmes: privatizing the technological incubators in Israel. Eur. Plan. Stud. 16 (2), 189–210.
Garretsen, H., et al., 2013. The future of regional policy. Camb. J. Reg. Econ. Soc. 6 (2), 179–186.
Hall, P.A., Soskice, D., 2001. Varieties of Capitalism; The Institutional Foundations of Comparative Advantage. Oxford University Press, Oxford.
Hjälpmedelsinstitut, 2014. About the Swedish Institute of Assistive Technology (SIAT), Retrieved from http://www.hi.se/other-languages/english/about-the-swedish-institute-of-assistive-technology/ (November 8, 2014).
Jencks, C., 1979. Who Gets Ahead? The Determinants of Economic Success in America. Basic Books.
Labaree, D.F., 2012. Someone Has to Fail: the Zero-Sum Game of Public Schooling. Harvard University Press, Cambridge, MA.
Lazonick, W., 2007. Varieties of capitalism and innovative enterprise. Comp. Social Res. 24, 21–69.
Lazonick, W., 2009. Sustainable Prosperity in the New Economy?: Business Organization and High-Tech Employment in the United States. Upjohn Institute Press, Kalamazoo, MI.
Lazonick, W., Mazzucato, M., 2013. The risk-reward nexus in the innovation-Inequality relationship. Ind. Corp. Change 22 (4), 1093–1128.
Lazonick, W., 2014. Profits without prosperity. In: Havard Business Review (September 2014).
Lis-Ginsburg, G., Porat, A., 2014. The Absorption of the Arab Population in Elite Technology Sectors: Report on the *Tsofen* Program (in Hebrew). Ministry of the Economy, Jerusalem.
Ministry of Industry Trade and Labor, 2010. Arabs in Israel: Population Profile, Employment Characteristics, Income and Expenditures 1980–2008.
Ministry of Industry Trade and Labor, 2012. Progress Report with reference to OECD Recommendations: Labor Market and Social Policy Israel. Jerusalem.
Morel, N., Palier, B., Palme, J. (Eds.), 2012. Policy Press, Bristol.
Morgan, K., Nauwelaers, C. (Eds.), 1999. The Stationary Office, London.
OECD, 2013. OECD Economic Surveys: Israel. OECD, Paris.
Office of the Chief Scientist, 2012. Programs and Support for R&D: 2011–2012. Ministry of Industry, Trade and Labor.
Orpaz, I, 2014. With High Wages and Quality of Life. The Marker.
Oughton, C., et al., 2002. The regional innovation paradox: innovation policy and industrial policy. J. Technol. Transf. 27 (1), 97–110.
Pack, H., Saggi, K., 2006. Is there a case for industrial policy? A critical survey. World Bank Res. Obs. 21 (2), 267–297.
Pierson, P., 2001. The New Politics of the Welfare State. Oxford University Press, New York.
Reiter, Y., 2009. National Minority, Regional Majority: Palestinian Arabs Versus Jews in Israel. Syracuse University Press, Syracuse, NY.
Rodrik, D., 2008. Normalizing Industrial Policy. International Bank for Reconstruction and Development/The World Bank.
Rueda, D., 2005. Insider-Outsider politics in industrialized democracies: the challenge to social democratic parties. Am. Polit. Sci. Rev. 99 (01), 61–74.
Sachweh, P., Olafsdottir, S., 2012. The welfare state and equality? stratification realities and aspirations in three welfare regimes. Eur. Sociol. Rev. 28 (2), 149–168.
Shachar, A., et al., 2005. Global Development in a Local Town: Local and Regional Effects of Kiryat Gat's New Industrial Park.
Steinmo, S., 2002. Globalization and taxation: challenges to the swedish welfare state. Comp. Polit. Stud. 35 (7), 839–862.
Teubal, M., 1997. A catalytic and evolutionary approach to horizontal technology policies (HTPs). Res. Policy 25, 1161–1188.
Trajtenberg, M., 2000. R&D Policy in Israel: An Overview and Reassessment. NBER Working Paper Series, Cambridge, Mass.
Trajtenberg, M., 2005. Innovation policy for development: and overview. In: Paper Presented in LAEBA 2005 Annual Meeting Buenos Aires, Argentina.
Vatat Professional Committee, 2013. Pluralism and Equal Opportunity in Higher Education: Expanding Academic Access for Arabs, Druze, and Circassians in Israel (in Hebrew).
WHO, 2011. World Report on Disability 2011. World Health Organization, Geneva, Switzerland.
Wade, R.H., 2012. Return of industrial policy? Int. Rev. Appl. Econom. 26 (2), 223–239.
Weiss, L., 2014. America Inc.? Innovation and Enterprise in the National Security State. Cornell University Press, Ithaca, NY.
Woodhouse, E., Sarewitz, D., 2007. Science policies for reducing societal inequities. Sci. Pub. Policy (SPP) 34 (2), 139–150.