

Profiling the Unemployed

A Review of OECD Experiences and
Implications for Emerging Economies

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Abstract

This paper takes stock of methods to profile the unemployed in public employment services (PESs) in OECD countries, in order to single out suitable approaches for PES in emerging economies. Profiling should enable PESs to segment jobseekers into groups with similar risk of work-resumption, and in turn to determine their level of access to different levels of treatment. In our framework PESs rely to a varying extent on (i) case worker discretion and on (ii) data-intensive approaches. On one hand of the spectrum, PESs may allocate interventions on a first-come-first-serve basis according to broad eligibility criteria (age, unemployment duration). This is likely to either induce deadweight loss or to delay treatment. Most often case managers' judgment, steered by qualitative guidelines, also plays a role. In this case outcomes depend strongly on the available time and capacity of case managers. An alternative approach is to exploit data about jobseekers to determine the probability of work-resumption according to a statistical model, which then allows the identification of customers most likely to need active labor market interventions. We argue that for PES in emerging economies that show limited case management experience and high customer load, statistical profiling could be a suitable tool to maximize the impact of their scarce resources.

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CONTENTS

1. INTRODUCTION	4
2. USES OF PROFILING	8
3. APPROACHES TO PROFILING	11
4. A FRAMEWORK FOR PROFILING SYSTEMS	15
5. DRIVERS OF PROFILING SYSTEM SELECTION	19
6. STATISTICAL PROFILING METHODS	21
7. POLICY APPLICATIONS OF PROFILING METHODS SOME SELECTIVE CASE-STUDY ILLUSTRATIONS	27
8. IMPLICATIONS FOR MIDDLE INCOME COUNTRIES	32
BIBLIOGRAPHY	36
ANNEX	38

1. INTRODUCTION

This paper analyzes and compares job seeker profiling methods adopted by key public employment services (PESs) of Organization of Economic Co-operation and Development (OECD) member countries. It is the combined result of desk research, direct discussions with PESs in several OECD countries, and a study tour by World Bank employment and social protection specialists.¹ This collaboration enables the paper to support these efforts in several ways:

- *It provides an updated baseline* on the latest profiling methods, tools, and approaches used by PESs in key OECD countries—as a benchmark to enhancing knowledge transmission to middle-income countries.
- *It develops a new analytical framework*, providing conceptual insights about typological features that differentiate profiling systems. Conceptual gaps in the current discourse are intended to be addressed.
- *It draws lessons about potential institutional and policy drivers of adoption choices* made by OECD countries regarding their profiling systems. Such discussion aids in contextualizing the utilization of different profiling systems.
- *It explores the rationale for, and the potential of, statistical methods* in profiling systems. It also sheds greater light on whether such frontier methods can be applied in middle-income country contexts.

The paper’s central objective is to discern the latest trends in methods adopted to profile job seekers and to explore the implication for middle income countries. The central role of profiling tools is to segment clients based on unemployment risk. High income countries have diverse ways of profiling job seekers, and no uniform trend has emerged (EC 2011a). Such diversity applies not only to the overall setup of profiling systems but also to their purpose and use. Caseworkers are central to the functioning of many PESs in terms of both diagnostics and allocation of services. In addition, while they have predominantly used *qualitative* profiling methods, *quantitative* methods first developed in Australia and the United States are also being used extensively, with new trials being rolled out in a select number of European countries. Regarding the *use* of profiling methods, variation also persists. Most use profiling to *segment* clients (i.g., Ireland, Netherlands, and Sweden), but some also use such tools for *case management planning* (i.g, Denmark and Germany). Finally, OECD countries have at best weak links between *resource planning* and their profiling systems. We focus less on the use of profiling systems for *automated job matching*, which can be considered a traditional core function of employment services outside the scope of this paper.

This paper explores frontier profiling methods against the backdrop of social benefit reforms to improve the efficiency of social spending. Many PES systems in OECD countries are reinventing their roles and refining their tools to cope with the prolonged

¹ The October 2013 study tour included visits to ministries of labor and public employment services in Copenhagen, Denmark; Dublin, Ireland; and Stockholm, Sweden.

aftereffects of the global financial crisis. Additionally, the PESs increasingly face expanded client bases because social safety net reforms generally require authorities to target all individuals who are deemed fit to work, or “work-able.” This new generation of welfare reforms, such as the Hartz Reforms in Germany, have focused on increasing client *activation*: their main objective is to make working more attractive than being a benefit recipient, through incentive compatible benefit design and the integration of employment and social assistance systems. Such reforms have expanded the populations that PESs traditionally targeted. Activation policies require PESs to tailor their services to clients in several ways: (a) to increase the employability of those who are actively seeking work; (b) to equip those who are considered inactive but work-able with the skill sets they need to enter the labor force; and (c) to improve upward mobility among those in low-productivity jobs.

Learning how high-income countries operate their PESs can help emerging economies to improve their own interventions to help job seekers. Toward those ends, this paper provides a best-practice synopsis on cutting-edge profiling methods, and it explores their applicability to ease capacity constraints in middle income countries (i.e., limited human resources, high job seeker caseloads, and tight fiscal conditions). It also explores the potential of profiling tools to inform early strategies that reduce long-term socioeconomic costs while also marshalling resources more effectively. Given the potential concerns about the applicability of methods that are so new, our approach is not prescriptive, but exploratory.

After heavily investing in social safety nets, middle income countries are grappling with how to “graduate” beneficiaries, and profiling can help meet this objective. While important variations in coverage and design persist across regions exist, safety nets have expanded dramatically in the past decade. Particularly in countries that experienced economic growth and rising incomes of the poor, the question of graduation of beneficiaries into self-sufficiency has now come to the forefront, and in particular how to crystallize the positive impacts of safety net expenditure. In this context, middle-income countries have much to learn from the successes and pitfalls of the “activation agenda”, as it is known in the European context. The key question however is to discern which of the approaches could be relevant in lower-capacity and resource constrained context. In this area, advanced profiling tools may be catalyzers of activation measures, by enabling more-personalized delivery mechanisms as well as customized active labor market policies based on client characteristics. This may be of particular importance in countries where public employment services remain under-developed compared to safety nets (as it is the case across most of Latin America), and where clients’ profiles are therefore scarcely developed. Secondly, profiling can assist PESs to focus their resources for activation where they are most needed, thus allowing to make activation more affordable. For example, with profiling PESs can better sort through diverse job seekers by tailoring case management intensity and frequency. Finally, advanced profiling can be also used to tailor job-finding approaches for the broader unemployed population.

Finally, the implementation of profiling tools engenders the need for evaluation of the effectiveness as activation programs for specific types of clients. While profiling aids PESs in the identification of customer segments, they cannot alone inform what programs are most cost-effective to maximize reemployment prospects. Leadership on this front requires discussion and evaluation of the most-effective activation strategies *for each profile group*, which is of great importance even if beyond the scope of this study.

The paper proceeds as follows: Section 2 discusses the main uses of a profiling system in employment services, followed by section 3, which illustrates different approaches to profiling observed in selected OECD countries. Based on this evidence, section 4 proposes an analytical framework to understand the trade-offs involved in the adoption of different profiling typologies. Section 5 looks at the drivers of countries' decisions in favor of specific profiling systems. Sections 6 and 7 provide an in-depth illustration of statistical profiling methods, which are especially likely to provide a degree of immediate support to PESs in emerging economies that are characterized by low-resources/high-customer loads. Section 7 provides selective case studies of the application of profiling tools to address policy priorities. Finally, section 8 summarizes the main conclusions and discusses the implications of this research for PESs in emerging economies.

2. USES OF PROFILING

Job seeker profiling is a diagnostic method to assess the prospects unemployed people to resume work. A review of profiling practices in many OECD countries finds their systems to be quite heterogeneous—and, based on their characteristics, they can fulfill one or more of the following objectives: segment clients by typology on an ongoing basis, guide targeting of interventions, inform fiscal allocations and budget planning, enrich labor market statistics, and, most importantly, facilitate job matching (see table 1).

The primary use of profiling is to segment job seekers based on similar unemployment risk characteristics, but this occurs under conditions of imperfect information. Profiling emerges as a critical tool to better *differentiate clients*. It seeks to construct a manageable set of client groups from a large heterogeneous group of job seekers.² However, client segmentation happens under conditions of potential asymmetric information and opportunistic behavior. First, those job seekers who primarily want to maximize benefits may tend to withhold key information during PES interviews and when meeting employers. Second, private service providers may cherry-pick clients by focusing only on those who are easier to place. Finally, PESs may over-estimate the benefits of specific interventions on all types of clients.

Profiling tools can also assist with planning for, and sequencing of, interventions. The results of profiling can inform the definition of appropriate treatment for job seekers in a context of *mutual obligations* between the PES caseworker and a job seeker—a principle that underlies activation policies. However, this experience varies considerably from one OECD country to another. In Ireland, the profiling method segments clients into two broad categories: high- and low-risk groups. To be profiled at high risk of unemployment signals to caseworkers the need to interview such job seekers more intensively than those in the low-risk group. In turn, profiling also connects risk groups to certain kinds of work opportunities: for example, high-risk groups in Ireland are more likely than low-risk groups to be placed in cash-for-works *public works* projects that enable them to reconnect with the labor market. In Germany, however, the job seekers' goals are defined based on different

² Although building manageable client groups may be one key purpose for profiling, some seemingly opposing trends have emerged in Europe: in Denmark, client differentiation has been reduced from five groups to three, while in Germany it has been expanded from four groups to six (EC 2011a).

profile categories, while Denmark recently replaced its former profiling model (the Job Barometer) with a new system that generates match-groups as indicators for referring job seekers to services (EC 2011a). For policy makers, profiling tools serve as control instruments by making job seeker assessment more standardized and by increasing coherence across PES and case managers in the choice and sequencing of interventions.

In addition, profiling can guide the resource allocation process within PESs. Profiling systems can expand the set of tools available for resource planning. In Australia, for example, profiling tools have proven critical for resource allocation for contracts with employment-program service providers. As such, profiling can support budget planning and inform fiscal allocations based on the unemployment risk of the profiled individual. Although many PESs in OECD countries use the unemployment rate to decide fiscal allocations, profiling tools provide an instrument that analyzes the distance from the labor market as a criterion to guide budget allocations.

Advanced profiling methods also have more applications outside the scope of this study, including job matching and labor market monitoring. PESs have traditionally focused on job matching using databases of vacancies. As data analytics becomes increasingly powerful, online tools akin to those used for statistical profiling can also profile clients in terms of their experience and personal competencies, thus helping to identify close matches with online vacancies through advanced coding of keywords related to skills and qualifications. In Denmark, a profiling tool called the *Mitkompas* was developed to focus specifically on soft skills, acting as a job seeker guidance tool and proposing concrete vacancies. Likewise, in Germany, the *Jobborse* works as an automatic matching tool that conducts preliminary profiling based on job seekers' competencies and then seeks to match their profiles with available vacancies (EC 2011a). Such tools are outside the scope of this paper as they are not designed to influence the PESs' customer management process, but rather they are part of the toolkit to assist customers in finding an appropriate exit from unemployment. In the aggregate, profiling tools can also assist with monitoring local labor market dynamics. The generation of soft and hard data on job seekers from profiling could also enrich labor market statistics, especially at the local level, and can help monitor its changing dynamics over time.

The recent mainstreaming of self-service platforms for incoming customers has provided additional embedded opportunities for client segmentation and profiling³. While many OECD countries with developed PES organizations do not apply pure "statistical profiling" methods, many of them are gradually introducing client-driven self-service models for benefit administration (e.g. UK Universal Credit) or labor market services (e.g. UWV Netherlands). Through these Internet-based applications, PES customers can enter information about their current profile, work history and qualifications. Customers with a more "market-ready" profile could be steered by the software towards self-service offerings initially (avoiding the relatively costly intervention of a PES counselor) and more "complex" cases of social and labor market integration could be steered towards an immediate interview with a PES counselor / caseworker. Observing this trend over the next years will determine if the increased use data in self-service contexts can help PES's to improve their customer flow and "embed" profiling into their standard (self-service)

³ We are grateful to peer reviewer Susanne Kraatz for point out at this emerging trend.

operations. The transparent handling of such automated self-service classification would need to be ensured in alignment with a country’s data privacy regulations.

Table 1: Uses of Job Seeker Profiling in Selected OECD Countries, 2013

Use of profiling	Focus	Description
Diagnostics	Client segmentation	Profiling differentiates clients based on unemployment risk diagnostics.
Targeting	Action plans and allocation to employment programs	Prior diagnostic profiling results help the caseworker to define client needs and to draft a mutually agreed-upon individual employment action plan.
Resource allocation	Budget planning and policy controls	Profiling can help PES management to plan fiscal resources based on severity of client profile. Profiling can inform PES management in aligning policy with resources based on setting and altering cutoff risk thresholds.
	ALMP contracts	Profiling can help PES caseworkers to contract out employment programs to private service providers.
Additional applications	Enrichment of labor market statistics and aggregate skills profiling	Profiling of jobseekers gathers information that can enriching labor market statistics and can be useful for understanding dynamic changes over time. Profiling can support efforts to conduct macro-level skills needs assessments based on aggregate skills profiling.
	Enhancement of job matching	Client profiles can support PES caseworkers to better match jobseekers with available vacancies through job crawling mechanisms.

Note: PES = public employment service. ALMP = active labor market program.

3. APPROACHES TO PROFILING

Different countries have adopted varying profiling approaches of varying levels of sophistication. This section describes the primary profiling approaches adopted by OECD member countries, while the drivers of these systems will be the subject of section 5. Based on these definitions table 2 below presents a taxonomy of profiling approaches.

Caseworker-based profiling. Most PESs rely on their caseworkers' judgment to profile job seekers. This method, also known as the "caseworker discretion approach," is based on the idea that PES caseworkers are principally responsible for evaluating the job seeker's employment prospects, developing a plan for reemployment, and making the *final* judgment about the most appropriate intervention. Under this method, the caseworker represents the principal mechanism for conducting client segmentation, activity definition, and service referral and oversight. Profiling systems that heavily emphasize caseworker discretion typically involve qualitative assessment methods such as interviews, but quantitative tools are also used. In many cases, these caseworker-based systems are embedded into administrative systems (e.g. questionnaires in IT system screens). *Advantages:* Reliance on caseworkers significantly emphasizes the jobseeker's needs (depending on the tools used) based on close interaction between the counselor and the unemployed. *Disadvantages:* Caseworker assessment can be considerably *subjective*: in other words, different caseworkers might evaluate the same job seeker differently. This approach could potentially increase implementation costs because of its reliance on sufficient human resources. The system can also be hard to evaluate (O'Connell et al. 2009)

Rules-based profiling (with time-based segmentation). Certain countries rely on the administrative rules as a quasi-profiling method that specifies when reemployment services can be activated for job seekers. This basic profiling method refers job seekers to reemployment services only after crossing a critical threshold in their unemployment spell. For instance, before Ireland reformed its employment and social protection architecture, it employed this method (also known as a "time-based approach"): job seekers signing up with the social protection department would be referred to the national employment agency only after being unemployed for at least six months (O'Connell et al. 2009). *Advantages:* this method is simple to implement and somehow it directs scarce resources to a segment of the unemployed, but inefficiently and later than optimal. *Disadvantages:* The method does not differentiate among job seekers regarding their likely unemployment spell (which differs across individuals even within a time-defined period). Moreover, because referral to reemployment services kicks in only after an arbitrary unemployment duration for *all* job seekers, it likely undercuts effective preventive policies, which require early interventions. Additionally, as it does not differentiate among job seekers based on their individual risk of continued unemployment, it can waste resources by assisting individuals who would be perfectly capable of self-help (O'Connell et al. 2009).

Rules-based profiling (with demographic segmentation). Some PESs profile their unemployed based on administrative rules that specify those who can be *eligible* to access specific employment services. This method of profiling is a "demographic segmentation approach" based on the specific eligibility conditions that job seekers must meet to access reemployment services and programs. Typically, this method uses a broad analytical lens to differentiate job seekers based on such observable characteristics as age, gender, disability, or other vulnerability. For instance, PES caseworkers can activate access to

reemployment programs if job seekers belong to certain age groups (such as youth 15-24), are women, have a disability, or belong to an ethnic group facing political discrimination. *Advantages:* Based on clearly defined segmentation rules, this profiling method involves straightforward, thus less costly, implementation. *Disadvantages:* It does not account for individual heterogeneity within the predefined subgroups. For example, any particular young job seeker does not necessarily have the same unemployment risk as a fellow unemployed youth (O’Connell et al. 2009).

Data-based profiling. **Statistical profiling is an information-intensive method based on the analysis of quantitative statistical data.** This type of profiling method, more commonly used in Australia and the United States, is based on the econometric analysis of official demographic and socioeconomic data on job seekers to predict their likelihood of resuming work. This profiling method has high requirements for quantitative data, but the method provides for a *rigorous* analysis of factors that are most likely to influence the persistence of unemployment. The method’s key output is the segmentation of job seekers based on calculations of their risks of remaining unemployed. *Advantages:* Statistical profiling (a) provides *objective* and *standardized* assessments of job seekers’ reemployment prospects; (b) identifies high-risk job seekers early on to quickly activate preventive policies; (c) filters out the low-risk groups to optimize use of public resources; (d) generates a person-specific risk score that can deepen the individualized assessment of each job seeker; and (e) provides policy makers with the discretion and flexibility to adjust policy objectives based on the alteration of the unemployment risk cutoff point. *Disadvantages:* Misidentification can occur when poor data are an issue. Setup costs also need to be carefully weighed in relation to cost-benefit considerations. Moreover, statistical modeling needs to account for dynamic changes in the economy and therefore requires regular updating to preserve its predictive power (O’Connell et al. 2009).

Additional non-profiling methodologies. Employment service organizations might use a wide range of additional tools and administrative processes to deepen their understanding of individual or group conditions of their customers. Among those are psychometric and attitudinal survey and interview tools that help to better understand the motivations and dispositions of customers. In most cases, such in-depth analytics will only be applied in sequence after an initial profiling through the above-described methods has taken place.

Table 2: Approaches to Job Seeker Profiling in Selected OECD Countries, 2013

Method	Approach	Description	Pros and cons	Country examples
Caseworker-based profiling	Caseworker-based segmentation	Caseworkers are at the core of the PES's <i>profiling function</i> . In addition to diagnostics, caseworkers outline activity plan, decide interventions, and perform monitoring.	<i>Pros:</i> significant emphasis on individual job seekers' needs <i>Cons:</i> subjective assessment and significant emphasis on large human resources	Germany implements a four-phase PES model that includes profiling, setting of targets, activation of interventions, and follow-up. Caseworkers play a central role in all four phases.
	Time-based segmentation	Administrative rules stipulate the <i>threshold</i> in length of unemployment spell required for referral of job seekers for services.	<i>Pros:</i> simple mechanism with less demand for human resources <i>Cons:</i> ignores job seeker heterogeneity with respect to unemployment prospects; undercuts early interventions; potentially wastes resources	Prior to the 2008 crisis, Ireland adopted a "wait-and-see" approach. Job seekers on welfare benefits would be referred to national PES agency. only after being unemployed for at least six months. The United Kingdom also conducted a "market test" phase at the beginning of registration for clients who have the potential to find a job for themselves.
Rules-based profiling	Demographic segmentation	Administrative rules stipulate eligibility conditions based on observables such as age or gender for activating employment programs.	<i>Pros:</i> straightforward and clearly defined segmentation rules; potentially less costly to implement <i>Cons:</i> ignores heterogeneity among job seekers	Many OECD countries have ALMP programs targeting youth or other marginalized communities. One example is the Youth Job Program in Sweden, which targets youth aged 16–24 years.
	Statistics-based segmentation	Statistical methods analyze registry and survey data to segment job seekers based on the risk scores that predict their expected unemployment spells.	<i>Pros:</i> objectified standardized assessment; calculation of <i>individual</i> risk scores; support of early intervention; potential to direct resources only to high-risk groups; potential to increase policy makers' flexibility regarding level of resources <i>Cons:</i> poor data may inflate misidentification; dynamic changes in the economy reduce predictive power of <i>statical</i> models; setup costs need to be weighed as part of a cost-benefit analysis	The United States implements a statistical profiling model named the Worker Profiling and Reemployment Services (WPRS) in different] states. Sweden has started implementation of a statistical profiling model titled the Assessment Support Tool (AST). Australia implements the Jobseeker Classification Instrument (JSCI).
Data-based profiling				

4. A FRAMEWORK FOR PROFILING SYSTEMS

The preceding section listed the main job seeker profiling approaches based on a review of current literature and interviews with PES offices in OECD member countries. Recent papers by the European Commission represent commendable efforts to differentiate among European profiling systems (EC 2011a, EC 2011b), but a more systematic framework is lacking. This section seeks to develop a new analytical framework that differentiates profiling systems based on (a) the extent to which profiling is conditioned by information and data on the job seeker, and (b) the caseworker’s level of discretion. Figure 1 lists the main types of profiling systems in OECD countries based on this new classification framework. It also differentiates profiling systems based on uses and approaches to profiling. Annex 1 succinctly describes and compares each profiling system.

The levels of data availability and data processing on job seekers—and the extent to which they influence assistance of a PES client—can explain the diversity in profiling systems. Effective profiling that can account for the heterogeneity among individuals is highly conditional on the availability and use of job seeker information. When only basic administrative data on job seekers are available, PESs are highly constrained in segmenting clients based on their individual characteristics. Thus, they must rely largely on administrative rules that stipulate rules for segmentation. When better information is available that includes more demographic data, PESs can utilize their caseworkers (to the extent that such resources are available) to better diagnose clients, or they can combine statistical tools to guide caseworkers in their diagnostics. Statistical methods require sufficient information on job seekers to develop sufficiently predictive diagnostic tools. The availability of more-complex information that relates to attitudes and motivation can help PES caseworkers further account for individual differences by incorporating *private information* on job seekers’ behavioral characteristics.

Table 3: Information Flow between PES and Job Seeker, by Type and Sophistication Level

Basic demographic data	Labor market data	Complex data
<ul style="list-style-type: none"> ▪ Personal ID ▪ Age ▪ Gender ▪ Children ▪ Education level 	<ul style="list-style-type: none"> ▪ Employment status ▪ Duration ▪ Special needs ▪ Qualifications 	<ul style="list-style-type: none"> ▪ Soft and hard skills ▪ Motivation ▪ Behavior ▪ Health



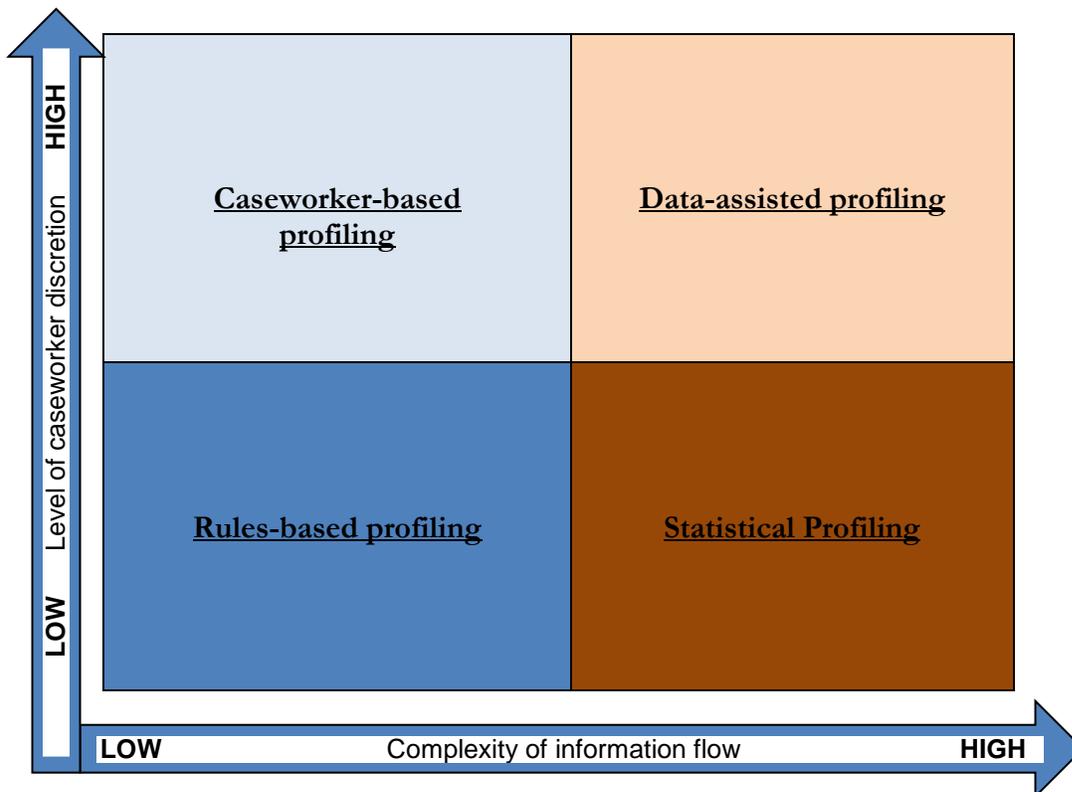
Level of complexity of information flow between job seeker and PES

A second dimension to classify profiling systems is the extent to which *caseworker discretion* is use to classify clients, vis-à-vis reliance on a system that *processes information automatically*. Three elements affect the level of caseworker discretion:

- *Human resources.* An under-resourced PES in terms of available caseworkers conditions PESs to utilize administrative rules to segment clients, implying a low degree of caseworker discretion. Therefore, one way to increase the caseworker’s discretion is to boost investment in available human resources.
- *Institutional development.* When job seeker data availability is generally poor, caseworkers’ subjective judgments remain the only plausible alternative.
- *PES interaction with the data it collects.* When caseworkers use and analyze sophisticated information through statistical tools, they may be better able to tailor employment assistance to job seekers’ individual characteristics. However, caseworker discretion may decline if processed job seeker information becomes the *primary* determinant of which employment programs a job seeker subsequently accesses.

The interaction between complexity of information flow and level of caseworker discretion yields four typologies of profiling systems.

Figure 1: Analytical Framework for Classification of Job Seeker Profiling Systems



Caseworker-based profiling. A combination of high caseworker discretion and low information flow gives rise to “caseworker-based profiling.” The caseworker takes a lead role in diagnostics and

treatment assignment, but the relatively limited availability of information does not readily permit *individualized* profiling. Assessment methods to profile job seekers are largely *qualitative*, and they require relatively less-complex job seeker information than other typologies do. OECD countries falling in this category include Denmark, Germany, the Republic of Korea, and Slovenia.

Data-assisted profiling. A combination of high caseworker discretion *and* high information flow gives rise to “data-assisted profiling.” Caseworkers retain their central role in customer segmentation and treatment assignment, but they use data more intensively for prior diagnostics of clients—a process that aids, but does not overrule, the caseworker’s final decision. As such, the profiling methodology is often “embedded” into customer workflows, forms, online-questionnaires or checklists. The available (additional) assessment tools include statistical profiling, psychometric or attitudinal screening, and soft-skills profiling. OECD countries falling in this category include Ireland, the Netherlands, and Sweden, but to the extent that psychometric screening is concerned, it also includes Germany.

Statistical profiling. A combination of low caseworker discretion but high information flow gives rise to “data-only profiling.” Under this typology, statistical profiling is the main and central tool, for automatically assigning customers to treatment streams. It therefore plays a combined profiling and targeting function. As a result, the statistical recommendations constrain the caseworker’s discretion. OECD countries falling in this category include Australia⁴ and the United States. However, Canada, Denmark (Job Barometer), Switzerland experimented with this typology before abandoning it (discussed below).

Rules-based profiling. A combination of low caseworker discretion *and* low information flow gives rise to *rules-based profiling*. Under this typology, profiling is based on prescribed eligibility criteria and therefore is focused at the *group* level. It also sets arbitrary unemployment-spell thresholds to determine how, or even whether, job seekers are referred to services. The caseworker, although dominant, plays a lesser important role in diagnostics and segmentation because these functions are defined a priori based on the conditions job seekers have fulfilled. OECD countries maintain, to varying degrees, special programs targeted at youth, persons with disabilities, or other marginalized communities.

⁴ In Australia, while statistical profiling is key in the determination of eligibility streams, a high level of discretion is then left to private providers on how best to assist the customers assigned to them (see chapter 7).

Table 4: Characteristics of Primary Job Seeker Profiling Typologies in Selected OECD Countries, 2013

CASEWORKER-BASED PROFILING										
Country	Name or description of profiling system	Uses					Approaches			
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Caseworker	Statistical	Psychometric	Eligibility
Korea, Rep.	Qualitative profiling	⊗`	⊗		⊗		⊗			
Germany	4-Phase Model	⊗	⊗	⊗	⊗		⊗		⊗	
Slovenia	Qualitative profiling	⊗	⊗				⊗			
Denmark	New Matching System	⊗	⊗		⊗		⊗			
DATA-ASSISTED PROFILING										
Country	Name or description of profiling system	Uses					Approaches			
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Caseworker	Statistical	Psychometric	Eligibility
Ireland	Probability of Exit	⊗					⊗	⊗		
Sweden	Assess. Support Tool	⊗					⊗	⊗		
Netherlands	Work Profiler	⊗				⊗	⊗	⊗		
Denmark	Job Barometer	⊗	⊗		⊗		⊗	⊗		
Finland	Statistical profiling	⊗					⊗	⊗		
STATISTICAL PROFILING										
Country	Name or description of profiling system	Uses					Approaches			
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Caseworker	Statistical	Psychometric	Eligibility
United States	Worker Profiling and Reemployment Service	⊗	⊗	⊗	⊗			⊗		
United States	Frontline Decision Support System	⊗	⊗	⊗	⊗			⊗		
Australia	Job Seeker Classification Instrument	⊗	⊗	⊗	⊗			⊗		⊗
Canada	Service and Outcome Measurement System	⊗	⊗	⊗				⊗		
Switzerland	Statistically Assisted Program Selection	⊗	⊗					⊗		

5. DRIVERS OF PROFILING SYSTEM SELECTION

What influences a given country's choice of profiling method? The primary country-specific drivers, discussed below, make for a complex mix of factors and forces—political, economic, technological, and social—that are inevitably unique to each country. Yet, this chapter tries to synthesize the lessons learned from different case studies on the adoption of profiling systems in their institutional and country contexts.

Governance- and policy-related factors. The type and nature of profiling system adopted depends much on a country's own social-safety-net policies and the extent of government vertical integration or decentralization. The bigger the scope of benefit delivery (i.e., integrated social insurance and social assistance delivery mechanisms), the bigger the demand for more-complex profiling systems. Vertical integration of service delivery between local and national governance levels also requires a *unified* profiling system. Further vertical integration involving private providers only underscores the necessity for a nondiscriminatory client view throughout the case management process (as in Australia, for example). Denmark's decision to abandon its statistical profiling system (Job Barometer) coincided with decentralization reforms allowing local PES offices greater autonomy (vertical disintegration).

Labor market conditions. Demand for diagnostic profiling tools can vary to the extent that a country's labor market conditions are influencing policy priorities. For example, worsening long-term unemployment (LTU)—which, in the wake of the financial crisis, fueled skills degradation, output loss, and strain on traditional safety nets in many OECD countries—provide a political imperative for policy makers to act fast to implement early intervention policies that deploy enhanced diagnostic tools. To adopt such measures, PESs should be able to account for job seekers' individual labor market prospects. Such a need after the crisis prompted Ireland to adopt a statistical profiling system within its new one-stop-shop service mechanisms, part of the country's wide-ranging welfare reforms. In contrast, profiling methods that rely on eligibility rules (demographic segmentation) or time-based segmentation are not conducive to early identification and individual differentiation.

Crisis-induced institutional change. Countries may find it easier to amend their profiling systems as part of a broader institutional makeover. Many EU member states stricken by the global financial crisis have addressed reduced fiscal space by seeking to make social protection mechanisms more cost-effective. By placing activation at the core of social protection systems, countries encourage social-safety-net beneficiaries to commit to active job searches while also identifying populations who have left the labor force but who are activable. The resulting institutional realignment in countries like Ireland—including closer integration of social assistance and PES mechanisms—has made it possible to scale up statistical profiling tools that previously were relatively pilot-level initiatives. Fluid institutional environments are more likely than relatively static conditions to tamp down potential caseworker resistance.

Cost-benefit considerations. Where LTU is not a major issue, an investment in advanced information architecture may not be justified from a cost-benefit perspective. Illustrating the point are the contrasting responses to the financial crisis by Ireland (adopting a statistical system because of more-severe LTU) and the United Kingdom (resisting statistical profiling because of a relatively

modest LTU increase). Notably, a low-LTU scenario may not support the development of sufficiently *predictive* statistical instruments given the relatively small sample size.

Capacity to collect and process information. Assuming that the investment in greater information acquisition is justified from a cost-benefit perspective, a profiling system is only as effective as its data collecting and processing capacity. However, the development of profiling systems with statistical tools at their core involve an inherent trade-off: Given the policy maker's tandem goal of improving program cost-effectiveness and reducing unemployment spells overall, the cost of information acquisition should not outweigh the benefits accruing from improved targeting.⁵ The decision to spend more on acquiring information would, at some critical point, generate diminishing returns. In underdeveloped PES systems with high caseloads, greater information acquisition may well require increasing the ratio of staff members to job seekers—a prospect that may be unfeasible for either political or financial reasons. A pressing question is whether statistical profiling can bend the cost curve while drastically improving targeting accuracy. This would require empirical verification.

Degree of caseworker resistance. Collectively, caseworkers can be strongly influential regarding the development trajectory of profiling systems. Caseworker resistance has been prevalent in some countries against automation of the PES's segmentation function. Such resistance occurred in Finland despite evidence that the country's statistical profiling model had high predictive accuracy. Such resistance might have stemmed from the manner in which statistical models are developed and internalized. In Finland, outside contractors developed the model, and such a strategy may have blunted valuable PES buy-in. Another case of caseworker resistance occurred in Korea, which initially experimented with a statistical system before abandoning it in favor of caseworker-based profiling using qualitative methods. Switzerland also tried a statistical model, but it ended up being largely sidelined because of the lack of incentives for caseworkers to use it (see Behncke, Frölich, and Lechner 2007).

Tightening fiscal space. Demands to gain efficiencies in the use of human resources may be related to increased reliance on digitization of employment services (e.g. in Denmark and the Netherlands). Moreover, a tightened fiscal base has been a primary reason for *resource rationing* toward the high-risk groups and reducing leakage to job seekers who can help themselves. This, in turn, increases demand for better accounting of job seekers' heterogeneous individual characteristics, with a view to grouping them based on the risk level to which more resources would flow.

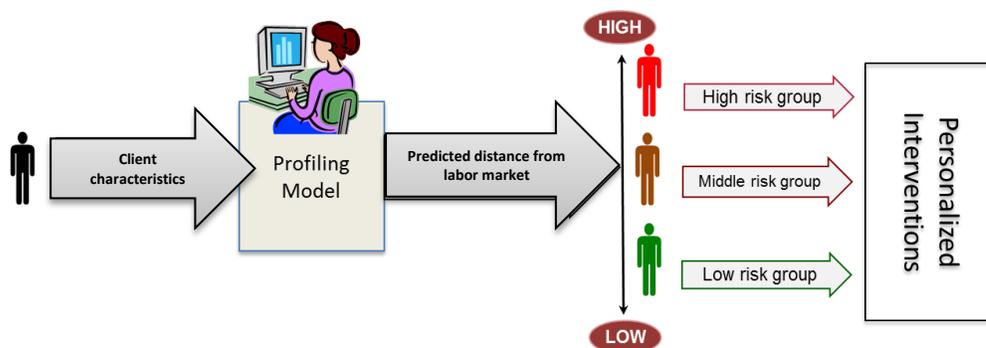
Program management contracts to private service providers. Outsourcing of active labor market programs (ALMPs) have become an important factor influencing the choice of profiling method. In Australia, where the PES maintains only policy-making and monitoring roles, unassailable diagnostics relying on hard data are of particular importance. Elsewhere, in contrast, preservation of tools and resources for in-house management of ALMPs seems to reflect greater centrality of caseworkers who resist automated diagnostic functions.

⁵ Targeting accuracy could be defined as the percentage of people retained in a job over the total number of people trained through ALMP measures.

6. STATISTICAL PROFILING METHODS

A country that adopts statistical profiling has a diagnostic econometric tool using survey and official registry data to segment job seekers based on their likelihood of work resumption. Official state employment agencies typically collect, through their management information systems, basic demographic information, including information on contribution and benefit history. This information can also be complemented with supplementary ad hoc surveys that collect richer information on job seekers regarding their literacy, employment history, motivation, language skills, etc. The whole data pool is used to develop a statistical model to correlate an individual's the risk of remaining unemployed for an extended period with risk scores based on various job seeker and other characteristics (figure 2). By generating a spectrum of statistical scores related to unemployment risk, the model enables employment agencies to segment job seekers by risk group (i.e., on a sliding scale from low- to high-risk). In other words, statistical profiling allows PESs to *group* individuals based on *individual risk scores that are similar*.

Figure 2: Mechanics of Statistical Profiling

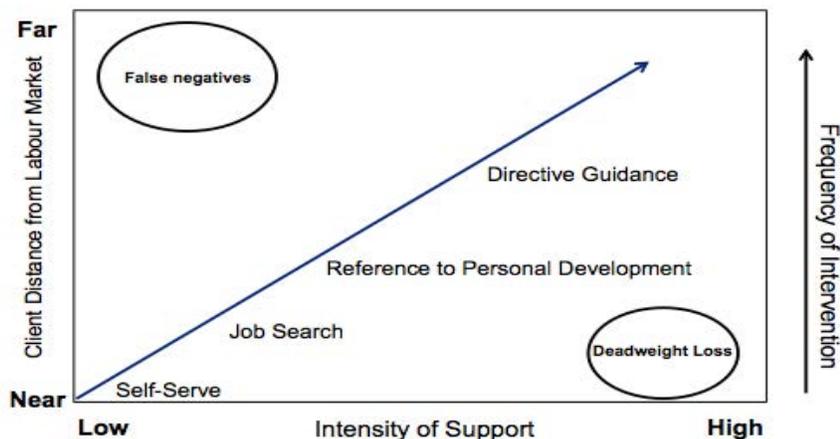


The primary uses of statistical profiling are to help PESs objectively determine (a) how long a registered unemployed person is likely to remain unemployed and (b) to differentiate the easy-to-place job seekers from the hard-to-place ones. Job seeker profiling systems that are solely based on caseworker discretion may undermine the goal of PESs to ensure that all job seekers are subjected to a standard assessment (Behncke, Frölich, and Lechner 2007). In contrast, statistical models “objectify the assignment process” (EC 2011a), which can streamline and standardize the assessments. Statistical profiling also departs from traditional *group-based* profiling (i.e., segmenting clients into broad categories such as youth, elderly, or people with disabilities), which take scant account of the clients’ heterogeneity.

As a result, statistical profiling gives counselors an objective basis for differentiating intervention intensity. Statistical profiling should help to enhance policy effectiveness by responding with activation measures geared to the individual. In particular, it can assign, with a good margin of certainty, the job seekers that should be likely to find employment through self-help alone (figure 3). Among the remaining clients who will require active interventions,

employment counselors can calibrate the intensity of services offered in the personal action plan based on the predicted duration of unemployment. In addition, in countries where counselors have scarce time and high caseloads, the tool can be mainstreamed into the business process to systematize and ration some of the decisions that case managers would otherwise make, thus reducing the *negotiation space* between counselors and job seekers (Behncke, Frölich, and Lechner 2007), cutting pre-interview time, and extending the most in-depth, time-consuming attention only to job seekers at greatest risk of remaining unemployed.

Figure 3: Link between Job Seeker Profiling and Intervention Intensity and Frequency



Source: Department of Social Protection, Ireland. Reproduced, with permission from DSP 2013; further permission required for reuse.

Statistical profiling enables PESs to deploy special interventions for the high-risk cases before LTU manifests. Traditional targeted approaches treat and invest special resources on the long-term unemployed only once their LTU would become apparent. This is a suboptimal decision because individual employability decreases with the duration of unemployment (EC 2011a). The focus on early interventions is important in terms of both employment program cost-effectiveness and overall fiscal savings from a likely reduction in benefit payments.

OECD countries seldom use statistical profiling for resource allocation despite its potential to predict resource needs. Resource allocation in many European countries has a weak link to the frequency of client contact (EC 2011a). Moreover, no financial quota requirements are envisaged on the basis of job seeker profiles in Europe. Other factors appear to play a more important role (Ibid.): For instance, the regional-level unemployment rates are important predictors of budgetary allocations. Moreover, caseload levels and average interview times are primarily used for human resource allocations. Australia stands in sharp contrast to the average European experience regarding resource planning. There, the statistical profile of the unemployed affects the payment to private service providers per placed individual, which is commensurate with the level of resources and effort required (ADE, 2013).

Although statistical profiling is not generally used as a stand-alone deterministic tool, its downsides need to be properly accounted for, as experience has shown that the number of PESs that have experimented with statistical profiling outnumbers those that

eventually mainstreamed it into their PES operations. For instance, poor data availability can affect the predictive accuracy of statistical models, which can include a high degree of errors. The information available from standard application forms capture the probability of reemployment only to a limited extent. Models without access to a greater data set may lead to similar or worse margins of error than those relying solely on caseworkers. And statistical profiling, used crudely, cannot capture the kind of private information that caseworkers can glean through in-depth interviews. Qualitative assessment methods are especially better suited to capture relevant private information about clients' motivations, work ethos, and personalities (EC 2011a). In addition, changes in the underlying economic fundamentals need to be properly accounted for and statistical models dynamically updated periodically to preserve their predictive power and relevance. Therefore, the cost-effectiveness of statistical models will depend on the quality of the data collected, the nature of unemployment in the specific country, and the case managers' ability. In countries where the latter are highly capable of identifying the long-term unemployed, the statistical model may be redundant.

Institutional resistance by caseworkers has been one of the main challenges to successful mainstreaming of statistical profiling. The review of existing OECD experiences has shown that, in certain country contexts, statistical profiling has been tried but quickly abandoned and not mainstreamed. Our review, based on a combination of desk research and conclusions stemming from a study visit to a select number of OECD countries, reveals the following: first, the tool offers low marginal utility relative to case workers' judgment, especially in high-capacity countries. Second, the tool was presented as part of the case management process. In several of the countries where the profiling systems were tried but never institutionalized (such as Denmark, Germany, and Switzerland), the tool was just one of the many diagnostics available to the caseworker and had no mandatory role in the process. In Switzerland, in particular, a randomized controlled trial found that despite the existence of a statistical system, caseworkers ignored it, especially because no incentives for caseworkers had been put in place for more systematic use.

A range of important factors needs to be considered while developing a statistical model:

- *Choice of the outcome variable.* This generally depends on the policy *focus* of the relevant labor market authorities (Hasluck 2008; O'Connell, McGuinness, and Kelly 2010).
- *Choice of econometric model type.* The applicable econometric models that OECD PESs have either used, or experimented with, represent at least two typologies: discrete choice models and duration models, each of which has its advantages and drawbacks, as further described below.
- *Choice and availability of data.* Basic statistical profiling typically uses administrative data from management information systems without adding supplemental survey information, which enriches the data and can improve statistical predictions.
- *Choice of econometric variables.* In the countries that have implemented statistical profiling, the choice of econometric models is less important than the types of explanatory variables included in the model (Berger, Black, and Smith 2001; O'Connell, McGuinness, and Kelly 2010).

Labor policy focus strongly affects the choice of the outcome variable. Most countries that conduct statistical profiling choose, as the outcome variable, the odds of remaining without a job for an extended period. The policy focus of the labor market authorities typically drives this choice. In Ireland and Sweden—two European countries actively using statistical profiling—the policy focus is on tackling LTU (O’Connell, McGuinness, and Kelly 2010). In contrast, the policy focus in the United States is on the exhaustion of unemployment insurance; hence, the outcome variable is the *period remaining to unemployment insurance exhaustion* (Ibid.).

The type of econometric model selected also influences the choice of the outcome variable. Two types of econometric models are generally used for statistical profiling: *discrete choice models* (logistic and/or probit models) and *duration models*. In discrete choice models, the outcome variable, as determined by the labor policy focus, is *binary*: for example, taking the value of one if a job seeker is unemployed for a specified period and zero otherwise (O’Connell, McGuinness, and Kelly 2010). In duration models, the outcome variable has a *time* dimension: for example, whether a job seeker, *conditional on the duration of unemployment*, will be still unemployed for an additional time-defined period (Rosholm et al. 2004). Duration models seek to exploit the data variation among those who either will not exhaust their unemployment insurance benefits or will not be long-term unemployed (Ibid.). Based on the comparative cross-country experience, countries using discrete choice models include Australia, Ireland, Sweden, and the United States (to name a few). Canada and Denmark focused on duration models during their experiments with statistical modeling, but both countries abandoned their statistical profiling systems.

OECD countries vary in their use of discrete choice and duration models. Irish labor market authorities opted for a discrete choice model by arguing that the “question of duration itself causes some problems” (O’Connell, McGuinness, and Kelly 2010). Three principal factors are provided (Ibid.): First, by selecting the duration of the first unemployment spell it can lead to confounding the true reason for an individual’s exit to labor market by potentially grouping together *true* exits with *administrative* closures. Second, some individuals may leave the labor market only briefly, which makes the case to merge several duration spells into two. And, third, estimations in duration models are sensitive to the decision rule adopted regarding duration, and thus such models may be potentially more error-prone than discrete choice models; such a decision rule on duration is potentially problematic considering any number of possible re-entrants into unemployment who had extended exit to labour market spells (Ibid). On the other hand, Berger et al. (2003) criticized the use of discrete choice models because their parameters ignore the potentially high heterogeneity among job seekers who are *not* long-term unemployed (Rosholm et al. 2004).

Although duration models have some clear advantages, the literature suggests that the difference in predictive power between the two approaches is low, while a focus on identifying highly predictive explanatory variables is more important. Despite the practical difficulties of determining duration spells from an administrative data source like that of Ireland’s, duration models themselves can capture *duration dependence* (Wong et al. 2002). Canada based its experimentation with statistical profiling on the proposition that the duration of unemployment affects the probability of reentering the labor market; in other words, the lengthier unemployment, the smaller the odds of exit—an outcome not easily captured by discrete choice models (Ibid.). Such duration dependence implies not only that employers are less likely to hire people whose skills may have languished or become outdated from long duration spells, but also that job-search intensity tends to decline (Ibid.). A comparison of several statistical profiling

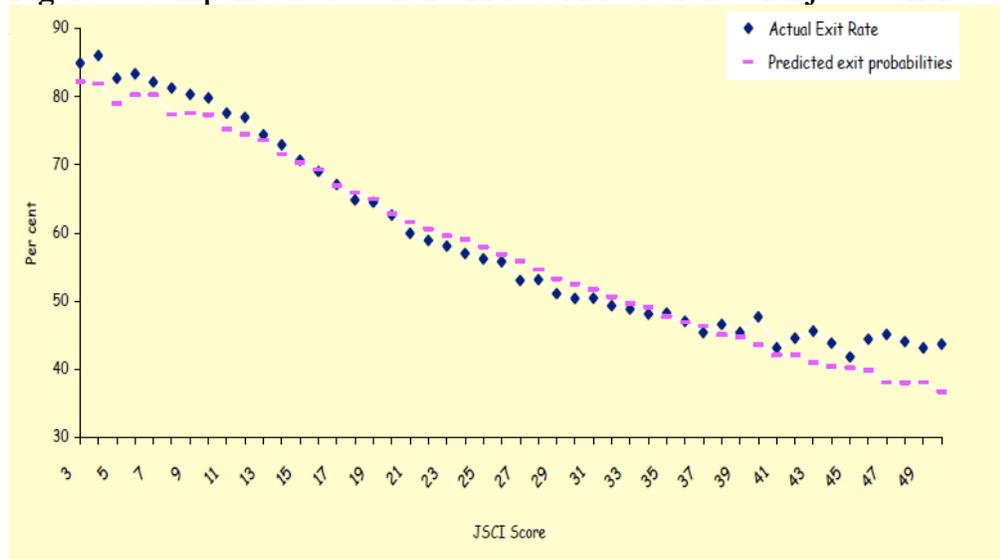
models, however, finds little *difference* in predictive power between discrete choice models (i.e., probit and logistic) and duration models (i.e., Cox proportional hazard models (Berger et al. 2001). Consequently, Berger et al (2001) conclude that the independent variables included in the model are more important than the actual models used.

Basic models can be built on the existing set of administrative data, but richer models typically require ad hoc surveys to identify additional salient regressors. Basic econometric models can be built using administrative data held by labor market authorities. When the Danish PES built its Job Barometer statistical model, it relied only on administrative files from the Danish Register for Evaluation of Marginalization (DREAM) containing the unemployed event histories such as the weekly status of unemployment registration, participation in ALMPs, and receipt of social assistance benefits (Rosholm et al. 2004). The PES decided to consider people who were not receiving public transfers as either working or having returned to work (Ibid.). A sample was constructed by PES of the inflow to unemployment through both the social insurance and assistance channels from January 1999 to June 2003. At the same time, the PES treated as right censored observations all exits from unemployment that were not associated with finding work (Ibid). The Danish statistical model included the following independent variables from the DREAM database: age; year when unemployment spell begins; municipality; local unemployment rate; marital, health, and immigrant status; unemployment fund insurance membership; work history; and participation in ALMPs. Sweden used a similar approach to develop its statistical profiling tool (as further described in the next section).

Other countries added survey research to their basic administrative data to determine which independent variables should be added to their statistical models. In contrast to the Danish approach, Irish PES combined basic administrative data with a 13-week survey of around 60,000 people who walked into social welfare centers to claim assistance. The survey collected a broader array of variables for the statistical model. Eventually only the survey's variables shown to have the highest predictive power were retained, and these questions were mainstreamed into the regular jobseeker application form. In the Netherlands, an extensive empirical review of possible reemployment factors was followed by a cross-sectional investigation to distinguish factors affecting long-term unemployed and those able to more quickly reenter the labor market (Dutch PES 2013). Thus, a longitudinal study was conducted using a survey of newly unemployed job seekers, implemented from April 2008 to March 2009 (Ibid.). By combining survey data with registry data on job seeker characteristics, 11 additional predictors were found significant.

Many statistical profiling tools have proven to be highly predictive, though this has not guaranteed their adoption within the PESs. In Finland, the statistical model was evaluated for its predictive power by using a 60,000-person sample comprising every seventh unemployed individual in 2005 and comparing predictions from the model with outcomes. The model correctly predicted outcomes in 89 percent of the cases (Riipinen 2011). In Ireland, the statistical correctly predicts outcomes in 69 percent of the cases among those with 50 percent chance of finding a job (Irish PES information). In Sweden, the *actual* share of job seekers whose unemployment lasted longer than six months corresponds with the risk bands generated by the statistical profiling model (Swedish PES 2013). Likewise, Australia's profiling system is highly predictive (figure 4).

Figure 4: Comparison of Statistical Model Predictions with Job Seeker Outcomes in



Source: IAB 2005

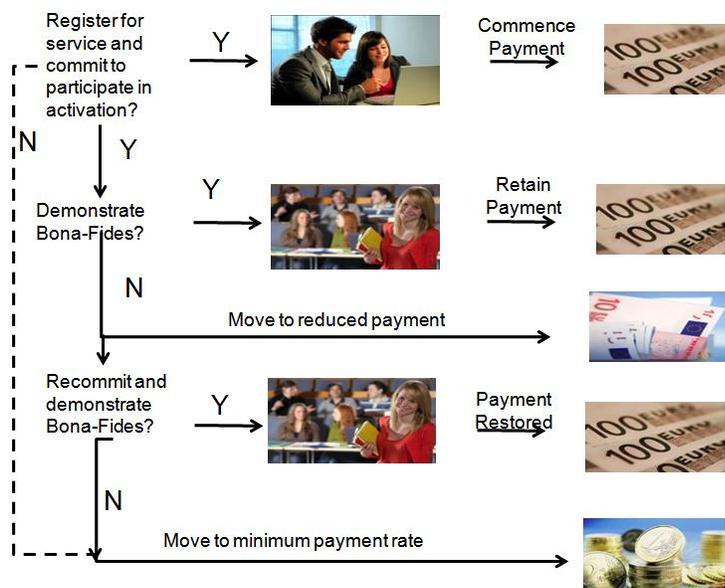
Note: JSCI = Job Seeker Classification Instrument. “Exit” refers to reentry into the labor market

The key lessons from OECD countries’ experiences in designing statistical profiling models are (a) ensure integrity of data collection, (b) use survey data (if available) for validating predictors, and (c) focus the sample of individuals being profiled on actual beneficiaries. It is imperative to have a competent PES staff that elicits correct information from the unemployed and to ensure proper imputation in the model (O’Connell, McGuinness, and Kelly 2010; Lipp 2005; Bimrose et al. 2007). Additionally, survey data availability helps to calibrate the model and increases its accuracy by continuously testing and updating predictors (O’Connell, McGuinness, and Kelly 2010). Finally, best practice suggests that clear selection criteria be used for identifying individuals who should be profiled to minimize deadweight; for instance, focus on only those job seekers who have received an actual welfare payment instead of anyone who makes a claim (Ibid.).

7. POLICY APPLICATIONS OF PROFILING METHODS: SOME SELECTIVE CASE-STUDY ILLUSTRATIONS

After the financial crisis, Ireland revamped its institutional framework to align PES services with social assistance. Before the global financial crisis, social assistance benefits were not explicitly linked to activation, and job seekers were referred to PES services only after at least six months of unemployment. This practice prevented early interventions for high-risk job seekers, wasted resources on those capable of self-help, and did not incorporate work-integration as a central element of social policy. Following the financial crisis, in light of significant labor market deterioration, Ireland moved to adopt *integration for activation* as a principal element of its revamped social protection system. Most of the benefits (e.g., job seeker benefits, the job seeker allowance, the back-to-work allowance, etc.) were explicitly linked to demonstration and commitment by the job seeker to activation. The country also adopted a sanction system based on a minimum payment rate to discourage successive failures by social assistance beneficiaries to maintain a commitment to work (figure 5).

Figure 5: Linking SA Benefits to Activation in Ireland after 2008 Financial Crisis

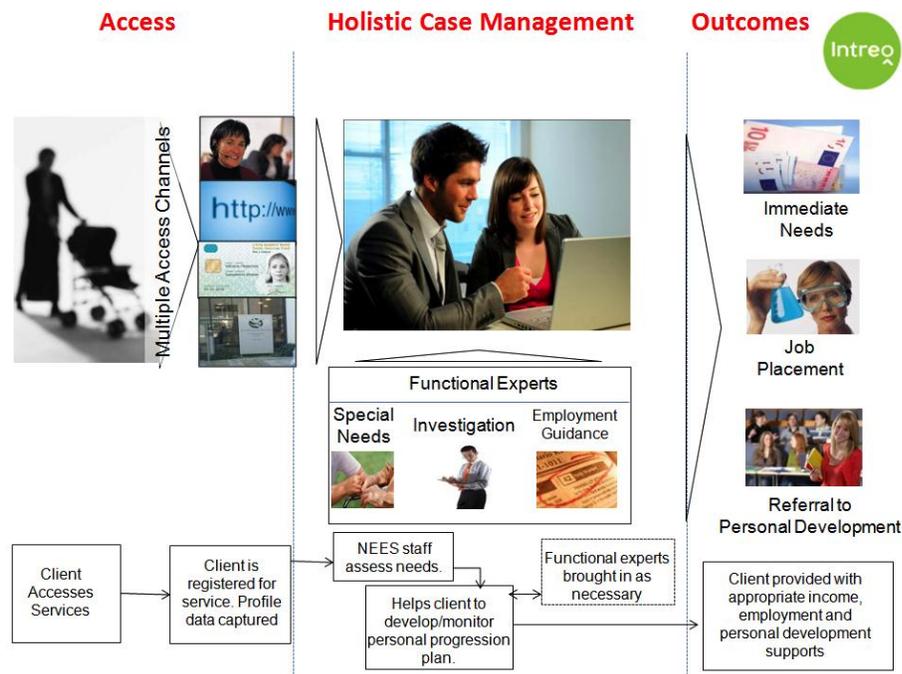


Source: Department of Social Protection (DSP), Ireland. Reproduced, with permission from DSP 2013; further permission required for reuse.

Institutional realignment based on the setup of integrated one-stop-shop service models was critical to integrate and align Ireland's PES services with social assistance. After the crisis, integrated one-stop shops, called Intreo, were set up to provide the following (figure 6): a *single* point of contact for all PES services and income support; tailored assistance with employment, training, and personal development; fast-track screening to facilitate queue management and prioritize early interventions; and assistance to employers to find job seekers with the right types of skills (DSP 2013). All job seekers requiring income support and seeking work are channeled through Intreo offices, where clients are registered and profiled. Ireland

adopted a statistical profiling tool that enables the social welfare authorities to estimate, at the point of registration, a job seeker's likelihood of remaining on the Live Register for more than 12 months. Profiling results are provided to counselors who work under a *holistic case management* approach by helping job seekers to develop *personal progression plans* based on individual needs. The assessment by caseworkers, combined with the results of the statistical profile, leads to one of three outcomes: provision of immediate interventions, referral to personal development (i.e., vocational training), or assistance to match the job seeker with employers.

Figure 6: Intreo: A One-Stop-Shop Integrated Employment Service Model in Ireland



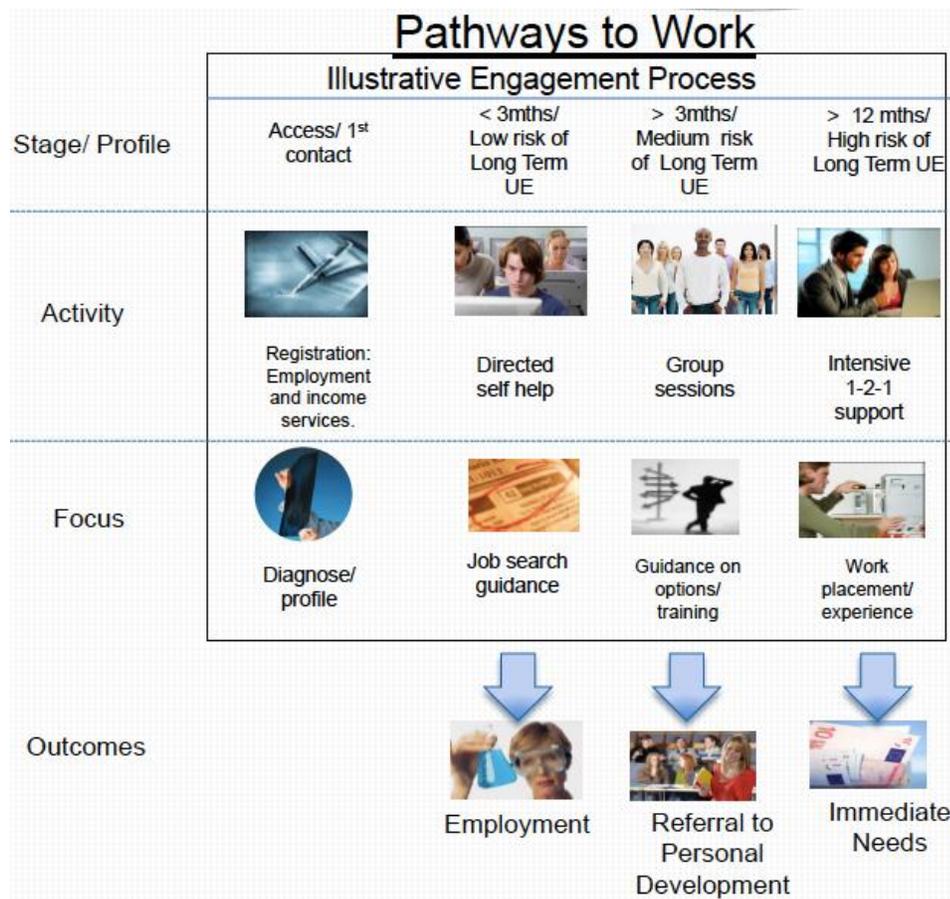
Source: Department of Social Protection (DSP), Ireland. Reproduced, with permission from DSP 2013; further permission required for reuse.

In the context of Irish welfare reforms after the financial crisis, statistical profiling has become a critical tool for managing customer flows. Ireland abandoned its previous blanket approach whereby job seekers were referred from income support to PES services only after they had been unemployed for at least six months (O'Connell et al. 2009). The new statistical profiling tool focused on managing client flows to prioritize individuals based on their risk of remaining unemployed over the long term (figure 7). The aims were to *calibrate* the intensity of support based on the level of unemployment risk; to provide individualized support; to treat all job seekers equally ex ante; and to use public resources more cost-effectively, particularly to contain leakage to individuals capable of self-help (DSP 2013). At the point of registration, statistical profiling generates *three risk groups*:

- *Low-risk clients.* Individuals at low-risk of long-term unemployment (remaining in the Live Registry for less than 3 months) receive caseworker-led planning and assessment, after which such clients would receive *job search guidance*.

- *Medium-risk clients.* Individuals at medium risk of long-term unemployment (remaining in the Live Registry for more than 3 months) would receive *group counseling sessions* and training opportunities to enhance skills.
- *High-risk clients.* Individuals at high risk of long-term unemployment (remaining in the Live Registry for more than 12 months) would receive one-on-one *intensive support*, be deemed to have *immediate needs*, and be activated for work-placement measures (i.e., public work projects).

Figure 7: Statistical Job Seeker Profiling and Client Management Flows in Ireland



Source: Department of Social Protection (DSP), Ireland. Reproduced, with permission from DSP 2013; further permission required for reuse.

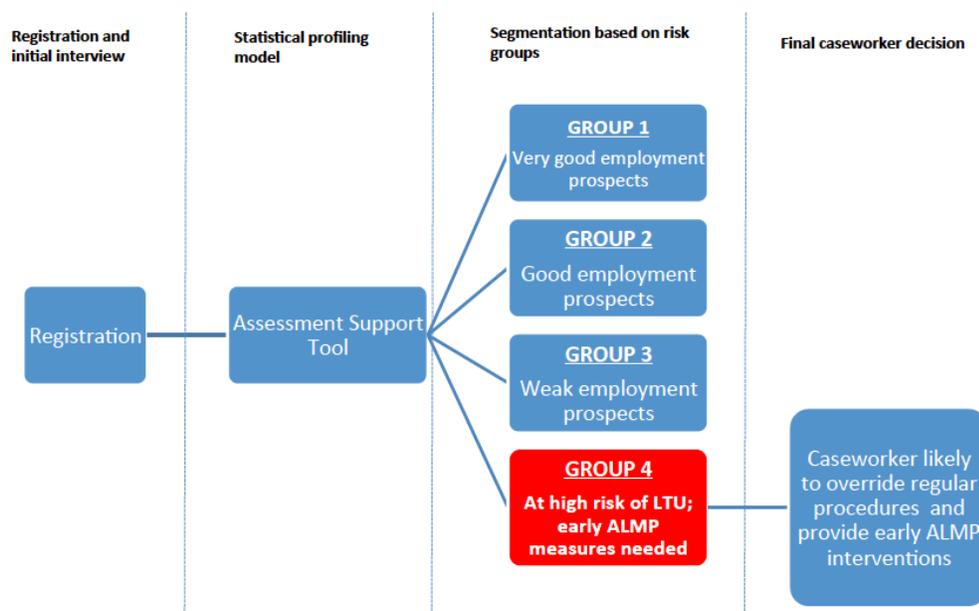
In Sweden, the activation of ALMP measures combines elements of a time-based and eligibility-rules segmentation. First, the Youth Job Program (YJP) in Sweden works based on *implicit* profiling through eligibility rules: only youth aged 16–24 years can gain access to it. The YJP also adopts a “wait time” of 90 days of registered unemployment before youth are able to join (considered a blanket approach). Upon entering the program, the first three months are spent on in-depth assessment, vocational guidance, and coaching (Swedish PES 2013). The remainder of the program is spent on measures such as direct work experience, vocational

training, and occupational rehabilitation. Second, the Jobs and Development Program (JDP), as part of the Swedish PES activation programs, targets adults who are at least 25 years old by extending the time horizon for in-depth assessment, job-search assistance, employability preparatory activities, etc., to 150 days. After 150 days, participants can gain access to phase 2 measures offering work experience and work rehabilitation, or, after 450 days, enter phase 3 employment at a provider (Ibid.).

However, with a recently adopted statistical profiling system, activation for high-risk job seekers has changed. In 2011, Sweden created an IT-based system called the Assessment Support Tool (AST) that allows PES counselors to identify high-risk job seekers early to assign early measures that are relevant for that specific individual. The decision to develop the tool stemmed from the national government's decision that the Swedish PES should tackle LTU. The government's decision was based on the belief that only a quantitative could correctly identify people with the lowest prospects of labor market integration. The tool has been conceived as an add-on information stream to a caseworker, recognizing that labor market success depends on variables such as social networks, ambition, mental and physical strength that statistical data do not easily capture. Hence, the development of the AST recognized the centrality of the caseworker discretion in final decision-making.

The AST establishes a mechanism enabling caseworkers to override regular procedures and to fast-track high-risk job seekers toward early interventions. The normal wait time for ALMP activation described above is overridden if the AST establishes a job seeker to be at high risk of LTU. The AST calculates a risk score that segments job seekers under four categories: (a) very good employment prospects; (b) good employment prospects; (c) weak employment prospects; and (d) high LTU risk. The AST signals to caseworkers to consider early interventions for clients within the last category by overriding regular wait times and standard protocols. In-depth assessment is conducted earlier and involves more frequent meetings (Swedish PES 2013). Other measures, including vocational training, work experience, occupational rehabilitation, or other employment preparatory activities, can also be activated early on (figure 8).

Figure 8: How Statistical Profiling Supports Early Interventions for High-Risk Job Seekers in Sweden

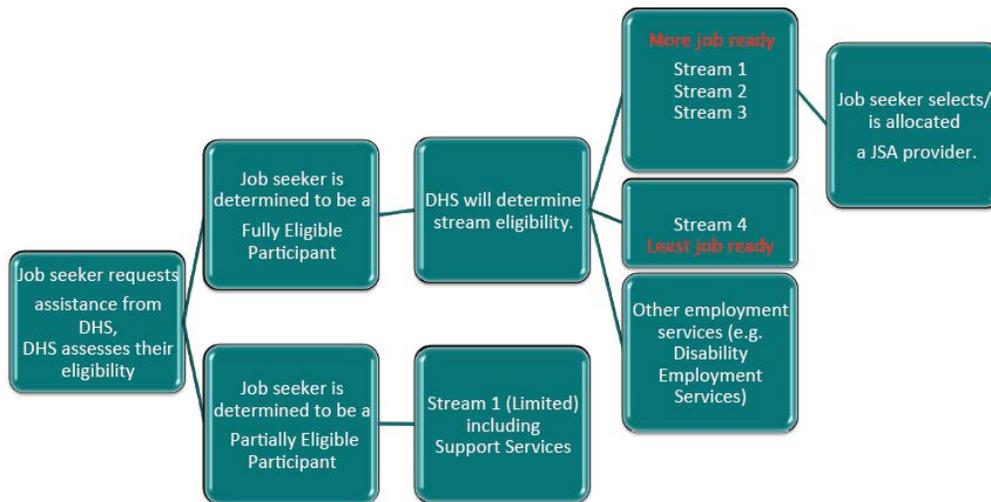


Note: LTU = long-term unemployment. ALMP = active labor market program

In Australia, employment services are a case of a competitive market that was once a public monopoly. Job Services Australia (JSA) is a system based on identifying four streams of job seekers (figure 9) based on levels of social exclusion (ADE 2013). The service was designed to increase labor market participation, especially among the most disadvantaged and socially excluded. Job Services Australia expenditure has totalled \$5.6 billion in the four years from 2009-10 to 2012-13. The investment covered the establishment of 87 JSA providers in over 1,700 places throughout Australia (Ibid.).⁶ The JSA system seeks to assist all job seekers and to work with employers.

⁶ “[JSA] providers are a mix of large, medium and small, for-profit and not-for-profit organisations that are experienced in delivering services and support for job seekers and employers” (JSA website: <http://employment.gov.au/job-services-australia-jsa>).

Figure 9: Linking Job Seekers with Employment Services in Australia, 2013

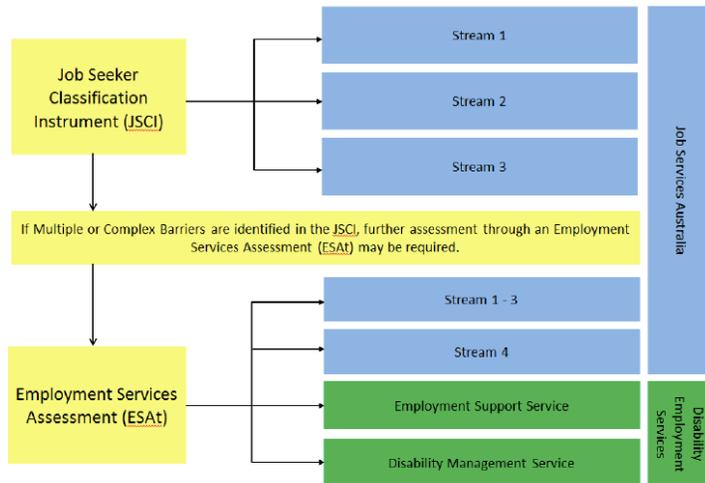


Source: © Australian Department of Employment (ADE) 2013. Reproduced, with permission from ADE 2013; further permission required for reuse.

Note: DHS = Department of Human Services. JSA = Job Services Australia.

The statistical profiling model in Australia is a critical element of the overall employment services architecture. A tool called the Job Seeker Classification Instrument (JSCI), which has existed since the 1990s, is a statistical diagnostic and targeting tool assessing the potential risk of LTU based on 18 differently weighted predictors including age, gender, recency of work experience, job seeker history, educational attainment, vocational qualifications, English proficiency, country of birth, indigenous status, indigenous location, geographic location, proximity to labor market, access to transport, phone contactability, disabilities or medical conditions, stability of residence, living circumstances, criminal convictions, and other personal factors (ADE 2013). Upon client registration, job seekers answer a questionnaire in order to determine the 18 covariates that compose the statistical model, which are then used to compute a JSCI score by the system. The JSCI score measures a person’s relative labor market disadvantage, and the higher the score, the greater is the likelihood of LTU. The client groups, or service streams, are the following: (a) stream 1, the job seekers who are most job-ready; (b) stream 2, the job seekers who face moderate employment barriers; (c) stream 3, the job seekers who face relatively significant employment barriers; and (d) stream 4, the job seekers who face the most severe employment barriers, and thus are the least job-ready (figure 11).

Figure 10: JSCI within Australia’s Broader Employment Services Architecture



Source: Australian Department of Employment (ADE) 2013. Reproduced, with permission from ADE 2013; further permission required for reuse.

Note: JSCI = Job Seeker Classification System. Stream 1 = job seekers who are most job-ready. Stream 2 = job seekers facing moderate employment barriers. Stream 3 = job seekers facing relatively significant employment barriers. Stream 4 = job seekers facing the severe employment barriers and are the least job-ready.

Figure 11: Australia’s JSCI, JSA Eligibility Streams, and Allocations to Private Service Providers



Source: Center for Social and Economic Inclusion 2012. Reproduced, with permission from CSEI 2012; further permission required for reuse.

Note: JSCI = Job Seeker Classification Instrument. JSA = Job Services Australia. Centrelink is the point of registration for benefits of the Australian Government’s Department of Human Services. Stream 1 = job seekers who are most job-ready. Stream 2 = job seekers facing moderate employment barriers. Stream 3 = job seekers facing relatively significant employment barriers. Stream 4 = job seekers facing the severe employment barriers and are the least job-ready.

While the job seekers' treatment stream is strongly determined by the JSCI statistical profiling tool, professionals' and private service providers can then exercise their discretion in how to treat complex cases. Upon registration the JSCI segments clients into three different eligibility streams (see figure 10), which is used as a steering node to direct jobseekers to Job Services Australia. In cases when the JSCI identifies serious barriers, further assessment through an Employment Services Assessment (ESAt) may be conducted with clients, who are then classified in four groups: clients may be either referred back to employment services, they can be directed to Disability Employment Services, or they may be referred to State funded services or other local complementary programs (as shown in figure 10). In sum, however, Australia represents a rare case among OECD countries on profiling: JSCI scores are critical to define eligibility streams. The discretion caseworkers have is to determine if a job seeker is sent for further assessment through an Employment Services Assessment, while Health Professionals come into play when multiple and complex barriers are identified. Bullet-proof segmenting is necessary to ensure that effective employment outcomes are achieved through the wide private contractor service network. Finally it is important to remember that a high level of discretion is still given to private service providers on how they use their funding to assign treatment to individual job seekers based on their needs assessment.

8. IMPLICATIONS FOR MIDDLE INCOME COUNTRIES

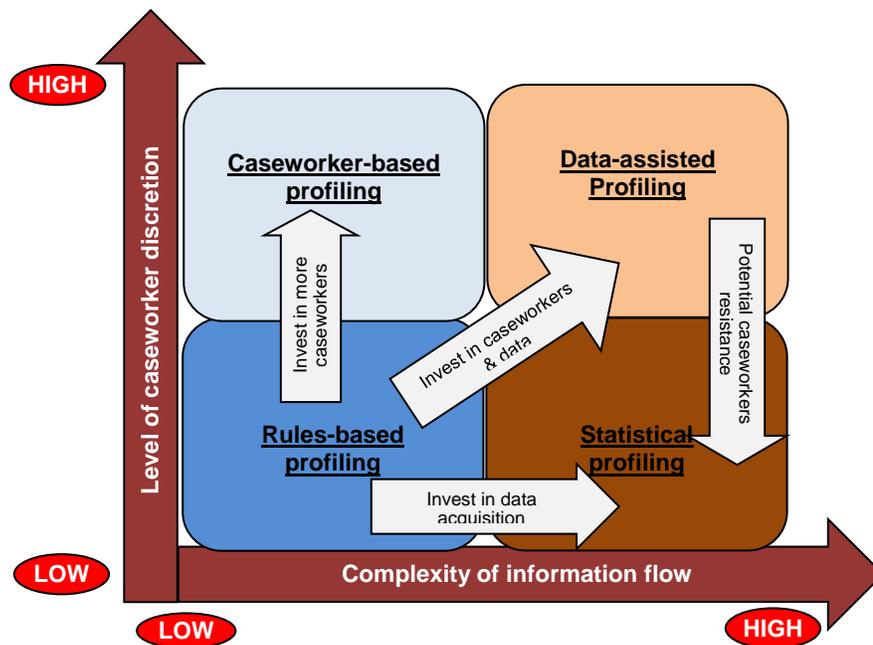
Existing studies suggest that profiling systems remain underdeveloped in the PESs of most middle-income countries and, when present, they have little bearing on treatment protocols. Although this paper did not attempt to conduct a systematic review of profiling approaches in developing countries, recent studies of the Western Balkan countries, Armenia, and countries in North Africa all suggest that profiling is rarely conducted systematically for job seeker segmentation into different groups with differentiated terms of service. On the other hand, the existing services are either untargeted (such as case management) or targeted through broad categorical criteria (such as educational level or age group). In no country examined was there a clear ex ante differentiation of job seekers according to their risk of unemployment that would have affected the level of service received.

With a move toward activation and integration of social and employment services, employment agencies are under pressure to serve larger and more heterogeneous customer bases than ever. The experience of many OECD countries reviewed so far suggests that their job seeker profiling systems are shaped by the complexity of their welfare systems. The greater the complexity of target groups served by the welfare system, the greater the need to develop a more sophisticated profiling tool that permits better rationalization of public resources while also serving a diverse client base. Countries as varied as the Eastern European and Baltic EU member states, Armenia, Turkey, the Western Balkan countries, or middle-income countries in Latin America are all grappling with the question of how to increase activation of social-assistance beneficiaries, for a range of reasons (see Sundaram, Strokova, and Gotcheva 2012). Hence, social protection systems are embarking on “second-generation” reforms that often

include mainstreaming of activation measures and mutual obligations for work-able adults. As a result, many previously unemployed and inactive individuals who had been reliant on various income support mechanisms (disability benefits, social assistance, etc.) are now newly targeted groups being drawn into mainstream employment services. As discussed extensively earlier in this paper, a similar trend took place in OECD countries in the past decade (EC 2011a). As the client base that many PESs must serve has become more diverse, the need to differentiate and prioritize clients is heightened.

To increase job seeker differentiation, developing countries could opt for a number of profiling systems. Figure 12 illustrates the potential decisions that governments in emerging economies face when moving from an eligibility-based targeting method to the kind of profile-based targeting system that is essential to prioritize services in a more tailored way. In particular, the choice of an optimal profiling system will depend on the availability of resources to either (a) process information about applicants, or (b) rely on the case managers’ capacity to correctly assess an individual client’s LTU risk.

Figure 12: Decision Tree for Moving from Basic to Advanced Profiling Systems



Most PESs in developing countries prove to be constrained in the quantity, and at times also in the capacity, of their case managers. A 2012 stocktaking exercise indicated that the large majority of PESs in Eastern European, Central Asian, and Middle Eastern and North African countries face much higher ratios of case managers to registered job seekers than the average 1-to-150 ratio in OECD countries (Kuddo 2012). These ratios can exceed 1 to 500 in countries such as the Arab Republic of Egypt, Kosovo, Lebanon, the former Yugoslav Republic of Macedonia, Morocco, the Syrian Arab Republic, and Turkey (Ibid.). Based on the OECD country experiences that this paper has described, the relative efficiency of profiling systems in middle-income countries will depend greatly on the number of caseworkers available and the quality and experience (or even existence) of case managers. In PESs with few experienced case

managers—or where the position of case manager is just being introduced (often through retraining of benefit administrators)—statistical profiling is likely enhance client flows management. Since activation is a fairly recent phenomenon in most emerging economies, the number of experienced caseworkers who can outperform statistical models is likely to be limited

Given their starting conditions, PESs in developing countries are more likely to benefit from statistical profiling more than high-income countries, and many have the infrastructure to do so. Governments in developing countries could either (a) to invest heavily in strengthening their caseworkers’ capacity to better diagnose clients, or (b) to leverage the existing data to provide caseworkers with profiling of newly registered job seekers, thus reducing the some of the process management burden (see figure 12 above). Investing in an automatized statistical profiling model is likely to yield better results, because their stock of case managers is relatively low, but the amount of information already available is often substantial. In fact, the first generation of social benefit reforms included the development of Management Information Systems, which are increasingly being merged with PESs in the context of activation. Developing countries with relatively short histories of case management also start with this advantage: introducing statistical tools is less likely than in high-income countries to be perceived as supplanting the staff’s professional judgment, especially if the profiling tool is used to manage 35 access to human services. Experience from a pilot in an emerging economy (Armenia) suggests that building a statistical profiling model may be a feasible exercise if the appropriate data is available (see Box 1).

Profiling will be of greatest use if PESs can identify areas in the business process where differentiation yields high benefits. Besides the technique to segment clients, the experience in OECD countries (reviewed in section 2, “Uses of Profiling”) indicates that job seeker profiling tools can find different applications in the business process. Before the tool is designed, it is important that the PES conduct a thorough diagnostic of their customer management process to identify the areas where they experience higher constraints and where there is greater potential to reduce deadweight losses due to undifferentiated treatment of customers. For instance, Ireland’s PES used profiling to set the waiting time for the first client visit with case managers, pushing the low-risk cases into self-help for the first weeks after registration. Sweden’s PES introduced its profiling model to override certain criteria to access ALMPs—ordinarily dedicated to long term unemployed—to introduce early treatment for people unlikely to find jobs on their own. As PESs in developing countries face constraints (such as the number of vacancies, low ALMP resources, or the number of case managers), profiling could have applications for prioritizing customers at different stages.

A second condition for success is that a sufficient array of effective interventions are available, to tailor them to the varying needs of job seekers. Although profiling is an important tool to improve PES efficiency, ultimately it will be useful only to the extent that PESs have a variety of services that can meet the specific needs of the different customer segments. For instance, some of the most hard-to-serve customers that were identified in the Serbian PES, include individuals with long histories of inactivity or unemployment, a high mean age, and low motivation to enter training (World Bank 2014). Prioritizing ALMPs for those who are profiled as high-risk would make sense only if such programs are well tailored to high-risk client. What would be less efficient is to deprive individuals with high net chances of success from existing ALMPs programs—even if not at highest risk of LTU— in favor of long term unemployed who may benefit relatively little from the same intervention.

Box 1: Piloting a statistical profiling model for Armenia’s employment services.

The World Bank team partnered with the Armenian State Employment Service Agency to pilot the feasibility of a statistical profiling model based on the Agency’s information system (GORT). The pilot used the anonymized records of current and past registered jobseekers as of October 2013 (270,304 individuals) to build a binary (probit) model that would predict the probability of individuals’ exit from the registry at 6 , 12, and 18 months since the month of registration, which could be considered different measures of long term unemployment (LTU). Factors significantly correlated with higher probability of unemployment duration included female gender, elder age categories, disability status, basic secondary and post-graduate education (as against primary), the receipt of unemployment benefits, receipt of family benefits, and a long contributory history. Stated interest in entrepreneurial activity and in engaging in some ALMPs at the time of registration had the opposite effect.

For illustration purposes, the table below shows the predicted probability of exit from the registry 12 months after registration, for individuals who entered the registry in the period April – June 2012. At an 80% cutoff (that is, among the individuals at the top 20% and at the bottom 20% of the distribution of the predicted probability score), 97% of those predicted to be LTU actually ended up as LTUs 12 months later, and 67% of those predicted to leave the registry ended up leaving before the 12th month. The model showed to have a similar degree of precision as to the models used in co countries such as Ireland (at the 50% cut-off rate). In addition, the predictive power showed to be greater when computed on waves of unemployed who registered in the year 2012, when economic recovery in Armenia was taking place after a deep recession in 2009-2010, compared to waves of unemployed who registered during periods of economic stagnation.

Predictive precision of statistical model for males who registered in April – June 2012

Cut-off	0.5	0.6	0.7	0.8
Total new registered in April-June 2012	2,492	1,952	1,410	623
Correctly predicted 12 months later	1,814	1,522	1,180	561
Percentage correctly predicted	0.73	0.78	0.84	0.9
Stayers correctly predicted	0.82	0.89	0.95	0.97
Leavers correctly predicted	0.58	0.58	0.58	0.67

Source: Nagler, Morgandi and Dahlen (2014).

In this context it is important that PESs invest in building data-based evidence about the net impact of their ALMPs, possibly by client profile typology. To identify cost-effective interventions, it is important to properly monitor—if not also evaluate—how existing programs affect employment. However, in the context of profiling, it would be important for PESs to track not only simple measurements of ALMP impact but also the heterogeneity of customers who enter into them and how the observed impacts vary in relation to the differentiated groups of individuals. This information should help to identify the most-suitable interventions for particular groups of individuals.

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Korean PES: A Description of Profiling System of Korea.

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Swedish PES: A description of the Assessment Support Tool.

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Australian PES: Development of JSCI and a Technical Description and slides on employment services infrastructure in Australia

Swiss PES/SECO: A description of the Statistical Assisted Program Selection

ANNEX 1: DETAILED DESCRIPTION OF KEY JOB SEEKER PROFILING SYSTEMS IN SELECTED OECD COUNTRIES, 2013

CASEWORKER-BASED PROFILING											
Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Germany	4-Phase Model ⁷	⊗	⊗	⊗	⊗		⊗		⊗		Market profile; Activation profile; Support profile; Development profile; Stabilization profile; Assistance profile
<p><i>1st phase:</i> first interview with job seeker to identify strengths related to targeted occupation. Information entered into VerBIS to generate profile and attempt match with vacancies. Second interview held to identify job seeker's potential and obstacles to identify placement-related action. Both interviews combined place job seeker in one of six client profiles; <i>2nd phase:</i> caseworker and job seeker agree on feasible goal and most promising intervention for securing reemployment; <i>3rd phase:</i> a personal implementation roadmap is developed that includes an intervention strategy mix; and <i>4th phase:</i> implementation of intervention and subsequent follow-up.</p>											
Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Korea, Rep.	Qualitative profiling ⁸	⊗	⊗		⊗		⊗				Activation service clients; Training and job search skills clients; Job-matching service clients; Self-service clients
<p>Initial statistical profiling system was developed but subsequently abandoned due to concerns from caseworkers and lack of certain data. Currently, Korean PES classifies clients using qualitative methods. It involves the following: (1) career counselors and clients jointly develop the Individual Action Plan during the first interview. The caseworker thereafter enters the plan into a job matching system called WorkNet. A second meeting takes place two weeks later for the caseworker to decide the client profile. Based on the assessment of the level of willingness, competency, and job search skills, a caseworker decides on the classification types for job seekers. Caseworkers determine the level of job motivation based on the data in the job application, and the attitude of client during the counseling. Job search skills are also determined based on the data available in the job applications. Caseworkers determine the level of competency based on work experience, education, qualification, vocational training, foreign language skill, and computer skills.</p>											
Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Slovenia	Qualitative	⊗	⊗				⊗				<i>First profiling phase:</i> -Group A (first-time registrants, or those in

⁷ Source based on Employee-Focused Integration Concept of the Bundesagentur für Arbeit, including direct discussions with German PES.

⁸ Source based on tailored information provided to World Bank by Korean PES.

profiling ⁹											unemployment for more than a year); (group A is further stratified in “low-risk” (newly-registered who can find own job) and “high-risk” (inactive, disabled, etc.). <i>Group B</i> (re-registering after enrolling in activation program, or reregistering after less than 1 year in unemployment) <i>Second profiling phase:</i> Easy-to-employ; Employable (moderate needs); Difficult-to-employ (in-depth assistance)
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Caseworker profiling takes place using qualitative methods in *two phases*: upon initial registration, and additional profiling during the counseling phase. Upon registration with the PES, job seekers are segmented into two groups (A and B) based on the following: group A members are considered those registering for the first time or after more than a year of being without a job; group B members are those who reregister after enrolling in an activation program or reregistering after being less than a year in unemployment. Within group A, there is further stratification into 2 subcategories: i.e., a low-risk group, which includes most newly registered job seekers who are assumed capable of independently finding a job; and a high-risk group, which includes persons with disabilities, minors under the age of 18, those with health problems, or those inactive for a longer period. The method of profiling includes documentation by the job seeker on age, labor market activity, past employment, and observation of behavior. After registration, Slovenian PES is obliged within 14 days of registration to hold the initial intake interview to gather data for placement that includes skills, employment goals, etc. A second in-depth interview also takes place which lays emphasis on the needs and actions to be taken to facilitate employment. Additional profiling of both groups A and B is conducted during the first counseling sessions in which a caseworker assesses the competencies, the level of activity, initiative and IT skills, and labor market opportunities. This second profiling phase leads to 3 profiles: (1) easy-to-employ; (2) employable with moderate need for assistance; and (3) difficult-to-employ with need for in-depth assistance.

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Denmark	New matching system ¹⁰	⊗	⊗		⊗		⊗				Ready to take on a job client; Ready for active employment measures; Temporarily on passive support

Denmark has abandoned its previous statistical profiling model (Job Barometer) and has moved to a new matching system. The system has sought to provide a simpler model with clearer distinctions between the match groups. The main features of the system are multi-level segmentations: first, a determination of whether the job seeker can take a job within three months of unemployment. In the event of a positive outcome, it is considered a ready-to-take-on-a-job group. If the outcome is no, a different segmentation occurs based on whether a client can partake in activation measures. Those ready to sign up for ALMPs are treated as ready-for-active-employment measures, while those that cannot are considered as temporarily-on-passive-support. The new matching system consists of a caseworker assessment by conducting two questions (whether a citizen is able to take on a job, and if the citizen is able to take part in ALMP measures). This determination is combined with a public assistance record, which now includes an enhanced IT system that provides caseworkers automatically with information on the length of time a jobseeker has received public assistance.

DATA-ASSISTED PROFILING

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process	Matching	Labor	Case-	Statistical	Psychometric	Eligibility	

⁹ Source based on direct information shared with World Bank (slides containing summary information on draft paper on profiling by Employment Service of Slovenia), including direct discussion with Slovenian PES.

¹⁰ Source based on information received during a World Bank study tour in Copenhagen, Denmark, to the Danish Labor Market Authority during October 14-15, 2013. Source also based on Employability Profiling System – The Danish Experience, 2011 (National Labor Market Authority).

				steering		statistics	worker	-tical	-metric	bility	
Ireland	PEX (Probability of Exit) ¹¹	⊗					⊗	⊗			Low-risk (likelihood of unemployment < 3 months); Medium-risk (likelihood of unemployment > 3 months); High-risk (likelihood of unemployment >12 months)

Before adopting its new profiling tool, Ireland applied a blanket/uniform approach in which jobseekers were referred for assistance only after a certain unemployment spell occurred. In light of evidence of deterioration in labor market conditions in Ireland, especially given the global financial crisis, a statistical profiling tool gained greater traction as a tool to rationalize on public resources and to tackle long-term unemployment through early action and identification. A statistical model was subsequently developed using administrative data and survey data from a tailored questionnaire that was administered to all individuals making an unemployment claim during a 13-week period between September and December 2006 (O’Connell et al. 2009). The department that administered the claims also tracked the status of the claimants over the subsequent 15 months (Ibid.). The purpose of the profiling tool has been to enable the social welfare authorities to estimate the likelihood for an individual to remain on the Live Register after 12 months, which can identify job seekers requiring immediate work-resumption assistance and to refer them to services meant to enhance their employability (Ibid.). These individuals at high risk and needing immediate assistance would be referred to the Irish PES for assistance. The statistical tool will segment individuals making an unemployment claim based on the risk of becoming long-term unemployed varying from 0 to 1 (Ibid.). Therefore, to conclude, the objective of the statistical tool is to differentiate between job seekers who exit the Live Register and get a job from those who stay in the system (Ibid.). The definition of the dependent variable in the model was developed in relation to the policy objective of the Irish PES. With the policy objective being reduction of the risk of sliding into long-term unemployment, the dependent variable was chosen to be the risk of remaining unemployed for more than 12 months or 52 weeks (Ibid.). Ireland implements a probit-based model (see O’Connell et al 2009, 32–33, on model approach). Key covariates included in the model are personal and family characteristics, human capital characteristics, and unemployment and benefit history (O’Connell et al.2009, 36-38).

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statis-tical	Psycho-metric	Eligi-bility	
Sweden	Assessment Support Tool (AST) ¹²	⊗					⊗	⊗			Very good employment prospects clients; Good employment prospects clients; Weak employment prospects clients; At-high-risk of long-term unemployment

In 2011, Sweden created an IT-based system called the Assessment Support Tool (AST) that allows PES counselors to conduct early identification of at-high-risk job seekers in order to assign early measures. The decision to develop the tool came from a Swedish Government decision instructing the Swedish PES to tackle long-term unemployment. The AST appears now be in use throughout the Swedish PES network. The government decision was based on the belief that a quantitative tool was required to be able to correctly identify those individuals with the least prospects of labor market integration. In the pilot phase of developing the tool, it appears several lessons were drawn. One was that in scaling up the tool, there was recognition that the buy-in of the PES management and PES counselors was essential. Second, the tool was conceived as an add-on information stream to a caseworker, recognizing that labor market success depended on variables such as social networks, ambition, mental and physical strength that were not easily captured through statistical information. Hence, the development of the tool recognized the centrality of the caseworker discretion in making a final decision. A further important consideration for the development of the tool was that it was only aimed to profile for segmentation, and not for automatic targeting. In other words, the tool would only aim to differentiate between low-risk and high-risk job seekers. Upon registration, the caseworker

¹¹ Source based on information received during a World Bank study tour in Dublin, Ireland, to Irish Department of Social Protection during October 3-4, 2013. Source also based on O’Connell et al. 2009.

¹² Source based on information received during a World Bank study tour in Stockholm, Sweden, to the Swedish PES during October 15-16, 2013. Source also based on tailored written information shared directly by Swedish PES.

conducts an initial interview with the job seeker collecting data on 11 predictors, which allows the AST to devise a risk estimate, generating four different risk categories. With the aid of the AST output, a caseworker adds own judgment and the job prospects to make a final decision about segmentation, paving the way for the second stage to decide the right types of measures.

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Netherlands	Work Profiler and Work Predictor ¹³	⊗				⊗	⊗	⊗			Low risk of long-term unemployment clients; High-risk of long-term unemployment clients

The Dutch PES has developed a tool called the Work Profiler, designed for job seekers with recent work experience who receive unemployment benefits under the Dutch Unemployment Act. The Work Profiler is tasked with selection and short diagnosis of this group of job seekers. As it pertains to selection, the tool includes 11 hard and soft indicators that the Dutch PES found to be predictive for work-resumption within 12 months. Specifically, the Work Profiler predicts the probability for work resumption at the start of a particular job seeker's unemployment. The prediction segments job seekers by those at higher risk, who subsequently receive more intensive and face-to-face attention, while those at lower risk receive only online services. With regard to diagnosis, the scores on each of the individual predictors provide information on which of these factors are likely to undermine likelihood for work resumption, which suggests the need for further attention. The Dutch PES also uses the individual predictors to determine which online services are better suited to the individuals, thereby developing a tailored approach. The Work Profiler is a digital tool that a job seeker utilizes between weeks 6–8 of unemployment, consisting of 20 questions that correspond to the 11 predictive factors. The Work Predictor is currently used in 3 PES locations in Netherlands, but the aim is to extend this throughout the country by the end of 2013. The predictors include: (hard factors) age, years employed in the last job, problems understanding Dutch; and (soft factors) views on return to work, feeling too ill to work, job search behavior, i.e., contact with employers, job search intention, external variable attribution, general ability to work, physical ability to work, and mental ability to work. In addition the Dutch PES has an instrument called Work Predictor, giving job seekers information on opportunities in the labor market by combining the approximate profession being sought, the region where the job seeker resides, the age of the job seeker, the duration of the current unemployment spell, and the physical distance that the job seeker is willing to travel for working.

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Denmark	Job Barometer (discontinued) ¹⁴	⊗	⊗		⊗		⊗	⊗			Immediate match; High degree of match; Partial match; Low degree of match; No match

The Danish PES developed a tool called the Job Barometer, a statistical profiling tool, which appears to have been phased out. The Job Barometer was used to calculate the probability of finding employment within the next 6 months based on customer account information that details public benefits received before. The Job Barometer was integrated as part of an overall Employability Profiling Process, which consisted of three phases: (1) preparation phase where the caseworker would receive initial CV from job seeker, pull the information from the client's customer public assistance account, and run a statistical test through the Job Barometer; (2) interview phase based on the Dialogue Manual covering the critical areas such as job seeker's perspectives on their own job prospects for reemployment; vocational qualifications and experience; personal and social skills; financial situation; and health condition; (3) assessment phase to make the overall assessment that would lead to 5 employability potential categories. These 5 categories of employability potential include: (a) immediate match; (b) high degree of match;

¹³ Source based on direct correspondence with Dutch PES, who shared with the World Bank a description of the statistical profiling method (i.e. The Work Profiler: A Digital Instrument for Selection and Profiling of the Unemployed in the Netherlands).

¹⁴ Source based on information received during a World Bank study tour in Copenhagen, Denmark, to the Danish Labor Market Authority during October 14-15, 2013. Source also based on Employability Profiling System – The Danish Experience, 2011 (National Labor Market Authority).

(c) partial match; (d) low degree of match; and (e) no match. The last category implies that a job seeker has extensive limitations in skills and resources to be able to match his or her case to any job currently available in the labor market.

Country	Name or type of profiling system	Uses					Approaches				Client group
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Finland	Statistical profiling (discontinued) ¹⁵	⊗					⊗	⊗			Low risk of long-term unemployment clients; High-risk of long-term unemployment clients

A statistical profiling tool was introduced in the Finnish PES in 2007. Due to caseworker resistance, it is no longer used. The tool was incorporated as part of an ICT-based system, which produced a risk estimate about an individual job seeker upon registration. The estimate would be received by a caseworker who would discuss it with the job seeker during the interview. In that sense, the profiling tool was meant only to guide a counselor toward a decision on segmentation and targeting, who maintained the final say. The statistical tool in Finland relied on administrative data, which included, among others, the following covariates: unemployment history, age, place of residence, previous occupation, citizenship, education, reason for termination of previous employment and information about potential disability. Each of the coefficients for the predictors capture the marginal effect of each covariate to the risk of prolonged unemployment. While the Finnish PES tested various econometric models, including OLS, probit and tobit, the econometric model that gained traction, before it apparently was abandoned altogether, was a logit model. According to Riipinen (2011), the model effectiveness was tested twice. Two data samples were constructed, one from year 2002, while the other from 2005, which included every 7th unemployed person. The 2002 sample was used to estimate the coefficients, while the 2005 sample was used as a test for different econometric models and their explanatory powers. The logit model developed appears to have correctly predicted 89% of the actual outcomes from observable data. However, an evaluation study conducted among Finnish PES counselors found that 3 out of 4 caseworkers did not incorporate the risk estimates provided by the model in the follow-up interview with the job seeker. Moreover, according to Riipinen (2011), 84% of the caseworkers stated they did not believe the tool was helpful and useful in making a decision about a job seeker, and they generally did not trust the model outputs.

STATISTICAL PROFILING

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
United States	Worker Profiling and Reemployment Services (WPRS) ¹⁶	⊗	⊗	⊗	⊗			⊗			<i>First stage:</i> identification of permanently separated workers eligible for unemployment insurance (UI); <i>Second stage:</i> segment clients based on those likely to exhaust UI and those not

A statistical profiling system was developed in the 1990s called the Worker Profiling and Reemployment Services (WPRS). The purpose of the system is to identify the likely dislocated

¹⁵ Source based on direct correspondence with Finish PES and Riipinen 2011.

¹⁶ Eberts, O'Leary, and Wandner 2002.

unemployment insurance (UI) claimants using statistical models and provide them with job search assistance during their early weeks of unemployment. The WPRS profiling represents a two-stage process: (i) identification of permanently separated workers, who also must be eligible for UI; and (ii) identify likelihood of UI benefit exhaustion using statistical modeling. The WPRS system is based on data that are collected on all individuals that begin a new unemployment spell, which is used to predict each claimant's probability of exhausting their UI benefits (O'Connell et al. 2009). States vary in what they include as covariates, e.g., Washington state includes as many as 36 covariates, while the state of Pennsylvania includes as few as 8 (Ibid.). Given civil rights issues, critical covariates such as age, gender, and race cannot be included (Ibid.). Thus the main variables generally included are educational attainment, job tenure, previous occupation, and previous industry (Ibid.). The WPRS system is based on the idea of profiling for targeting, in that profiled UI claimants are allocated to mandatory reemployment services based on the very risk scores that are generated by the statistical model, which does not permit any space for a caseworker to intervene, but discretion can be exercised when it comes to nonmandatory services (Ibid.). In addition, allocation of services also is conditional on the ability of local providers to offer reemployment services, which is also a function of financial resources (Ibid.).

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
United States	Frontline Decision Support System (FDSS) (Discontinued) ¹⁷	⊗	⊗	⊗	⊗			⊗			Clients segmented based on what ALMP typology likely to maximize job reentry

The United States experimented with a different targeting system called the Frontline Decision Support System (FDSS). While FDSS has been scrapped, it included a systematic job search module permitting the undertaking of structured search of vacancy listings. This module provided information about a customer's prospect for returning to a job; a realistic assessment of likely reemployment earnings; identification of occupations related to a prior job; and screening of job vacancy listings by region, occupation, and earning requirements. The second component of the FDSS included a service referral tool that identified the sequence of activities that most often lead to successful employment for clients with similar backgrounds.

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Australia	Job Seeker Classification Instrument (JSCI) ¹⁸	⊗	⊗	⊗	⊗			⊗			<i>Stream 1:</i> job seekers most job-ready; <i>Stream 2:</i> job seekers with relatively moderate barriers to employment; <i>Stream 3:</i> job seekers with relatively significant barriers to employment; <i>Stream 4:</i> job seekers with severe vocational and non-vocational barriers to employment

The Australian PES has been at the forefront of implementing statistical tools for profiling and targeting. A tool called Job Seeker Classification Instrument (JSCI) has been in existence since the 1990s, which is a statistical diagnostic and targeting tool assessing the potential risk of long-term unemployment based on dozen differently weighted predictors (age and gender, recency of work experience, jobseeker history, educational attainment, vocational qualifications, English proficiency, country of birth, indigenous status, indigenous location, geographic location,

¹⁷ Eberts, O'Leary, and Wandner 2002.

¹⁸ Source based on direct correspondence with Australian PES, which included tailored slides for World Bank describing employment services infrastructure in Australia, and separate slides on the Development of JSCI and a Technical Description.

proximity to labor market, access to transport, phone contactability, disability/medical conditions, stability of residence, living circumstances, criminal convictions and personal factors. The last factor requires caseworker judgment (O’Connell et al. 2009). An questionnaire comprising 18–49 questions is administered, which determines stream eligibility and need for further assessment. A JSCI score is determined based on information that is gathered by Centrelink upon registration on the mentioned covariates. The JSCI score measures a person’s relative labor market disadvantage, and the higher the score, the greater is the likelihood of *longer*-term unemployment. Those with multiple and complex barriers are referred for additional assessment at Employment Services Assessment (ESAt). It assesses the role of medical conditions or other barriers on capacity to work or benefit from employment services, and is administered by health professionals.

Country	Name or type of profiling system	Uses					Approaches				Client groups
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility	
Canada	Service and Outcome Measurement System (SOMS) (discontinued) ¹⁹	⊗	⊗	⊗				⊗			A Client Monitoring System (CMS) containing client specific information

SOMS was considered to be a statistical system intended for targeting employment services, rather than simply segmenting clients. It was developed in the early 1990s as a tool to help frontline staff better advise clients on the best ways to gain job reentry and to enable PES managers to use the best intervention strategies in helping job seekers achieve that outcome. SOMS was built around three axes: (a) a relational database containing job seeker-specific information for employment insurance beneficiaries, including beneficiaries and participants in PES training programs; (b) a tool/method intended to evaluate past services provided by PES; and (c) a computer-based statistical model capable of predicting the best service maximizing job reentry prospects for a job seeker. Additionally, an algorithm was integrated into SOMS in 1997 to enable prediction of which service best promotes employment among clients differentiated by demographic and geographical features. SOMS also served a “business planning” function related to *management reporting* (enabling PES managers and analysts to view summarized data *at varying degrees of detail* for different outcome measures and to analyze effectiveness and impact of services on clients). A second business planning function of SOMS was related to *accountability*, allowing PES managers to review performance and to accordingly alter decisions on resources and their targeting.

Country	Name or type of profiling system	Uses					Approaches				Client groups	Description [[AQ: This extra unused column should be deleted; right-most column should be “Client groups” as “Description” is in the text below.]]
		Diagnostics	Targeting	Process steering	Matching	Labor statistics	Case-worker	Statistical	Psychometric	Eligibility		

¹⁹ Colpitts 2002.

Switzerland	Statistically Assisted Program Selection (SAPS) (discontinued) ²⁰	⊗	⊗					⊗		- A targeting system segmenting clients based on services best capable of securing their job reentry	
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The Swiss State Secretariat for Economic Affairs (SECO) initiated a pilot study on statistically assisted program selection (SAPS), which took place from May 2005 to December 2005 in 21 regional employment offices in five different regions (Basel, Berne, Geneva, St. Gallen, and Zurich). About 150 randomly selected caseworkers were provided with predictions on potential labor market outcomes for their clients. About another 150 case workers, in the same offices, constituted the control group to evaluate the impact of the system. The predictions are based on two types of data sets. The first is a very rich data set drawn from previous job seekers, obtained from the unemployment insurance system and merged with the pension database, which is used for estimating the causal effect of programs. The second data set contains information on current job seekers from the unemployment insurance database. The variables contained in this data set for the current clients are a strict subset of those available for the past job seekers since the information from the pension system is not accessible as they would be available only with a substantial delay. The first data set includes all 460,442 job seekers who were registered at an employment office between 2001 and 2003; information from the unemployment insurance information system (AVAM/ASAL) is available up to December 2004. These data have been combined with information from the social security records (AHV) for January 1990 to December 2002. These combined data sources contain very detailed information on registration and de-registration of unemployment, benefit payments, sanctions, participation in ALMP, ten-year employment histories with monthly information on earnings and employment status and numerous socioeconomic characteristics such as qualification, education, language skills, job position, experience, profession, industry and employability rating provided by the caseworker. Given these very detailed data on labor market histories and current skills, it appears reasonable to assume that by conditioning on these characteristics selection bias can be avoided. The second data set for all the new job seekers is updated every two weeks, with the latest information from the unemployment insurance data system. A new semiparametric methodology was developed (Behncke et al 2006) to combine the information from the first data set, with the larger set of regressors available, in a way to derive predictions that only depend on the regressors available in the second data set. In the current implementation of the SAPS system, employment outcomes are predicted as the expected number of months in stable employment within the following twelve months. The choice of this short-term measure was motivated by the official goals of the federal unemployment system and also for being able to evaluate the impact of SAPS within a reasonable time frame. An employment spell is considered stable if it lasts for at least three months without a break. If an individual finds a job that lasts only for a few weeks, this is not considered a positive outcome since avoidance of unstable jobs and frequent re-registration of unemployment is also one of the official goals. This definition of the outcome variable favors fast re-employment and penalizes short employment spells

²⁰ Source based on direct correspondence with Swiss Secretariat for Economic Affairs (SECO), as well as Behncke, Frölich, and Lechner 2006.

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Abstract

This paper takes stock of methods to profile the unemployed in public employment services (PESs) in OECD countries, in order to single out suitable approaches for PES in emerging economies. Profiling should enable PESs to segment jobseekers into groups with similar risk of work-resumption, and in turn to determine their level of access to different levels of treatment. In our framework PESs rely to a varying extent on (i) case worker discretion and on (ii) data-intensive approaches. On one hand of the spectrum, PESs may allocate interventions on a first-come-first-serve basis according to broad eligibility criteria (age, unemployment duration). This is likely to either induce deadweight loss or to delay treatment. Most often case managers' judgment, steered by qualitative guidelines, also plays a role. In this case outcomes depend strongly on the available time and capacity of case managers. An alternative approach is to exploit data about jobseekers to determine the probability of work-resumption according to a statistical model, which then allows the identification of customers most likely to need active labor market interventions. We argue that for PES in emerging economies that show limited case management experience and high customer load, statistical profiling could be a suitable tool to maximize the impact of their scarce resources.

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