A global flow exists for example if F is globally Lipschitz continuous or if F is uniformly bounded. In case $\{x \in \mathbb{R}^n : (x|F(x)) > 0\}$ is bounded in $\mathbb{R}^n$ a global semiflow always exists (see [Deimling (1977), Sec.5.2]).

(b) We do not assume that ϕ_o is globally defined. Instead we consider a bounded domain $\Omega \subset \mathbb{R}^n$ with smooth boundary $\partial\Omega$ such that $(F(x)|\nu(x)) > 0$ for every $x \in \partial\Omega$. Here $\nu(x)$ denotes the outward normal vector.
Then for $x \in \bar{\Omega}$ we have $\underline{t}_x = -\infty$. Moreover, either $\phi_o(t,x) \in \Omega$ for all $t \geq 0$ or else there exists a unique s_x with $0 \leq s_x < \bar{t}_x$ such that $\phi_o(s_x,x) \in \partial\Omega$. In the first case we write $s_x := \infty$. Then we define $\phi : \mathbb{R}_+ \times \bar{\Omega} \to \bar{\Omega}$ as follows:

$$\phi(t,x) := \begin{cases} \phi_o(t,x) & \text{if } 0 \leq t < s_x \\ \phi_o(s_x,x) & \text{if } \quad t \geq s_x \end{cases}$$

ϕ is a continuous semiflow on the compact set $K := \bar{\Omega}$. We have $K_\infty = K$ and $\phi|K_\infty$ is not injective.
In case F is differentiable, the generator of the corresponding semigroup is the closure of the operator A_2 defined by
$A_2 f := (F|\text{grad } f)$, $D(A_2) := \{f \in C^1(\bar{\Omega}) : (F|\text{grad } f) = 0 \text{ on } \partial\Omega\}$.

(c) We consider Ω as in (b) and assume that $(F(x)|\nu(x)) \leq 0$ for every $x \in \partial\Omega$. Then for every $x \in \bar{\Omega}$ we have $\bar{t}_x = \infty$.
Thus $\phi := \phi_o|\mathbb{R}_+\times\bar{\Omega}$ is a continuous semiflow on $K := \bar{\Omega}$.
If $(F(x)|\nu(x)) < 0$ for some $x \in \partial\Omega$ we have $K_t \subsetneqq K_s$ whenever $t > s$ and $\phi|K_\infty$ is injective. For a differentiable vector field F the generator of the corresponding semigroup is the closure of A_3 defined as follows: $A_3 f := (F|\text{grad } f)$, $D(A_3) := C^1(\bar{\Omega})$.

We conclude the discussion of semi-flows associated with ordinary differential equations by remarking that the ideas of (b) and (c) can be combined to obtain semigroups for more general subsets Ω.

We continue the discussion of the spectrum of semigroups of lattice homomorphisms on $C(K)$ given by (4.1). Thm.4.4 gives a good description of the part which is contained in $\{\lambda \in \mathbb{C} : \operatorname{Re}\lambda < \underline{c}(h,\phi)\}$.
It is easy to see that the half-plane $\{\lambda \in \mathbb{C} : \operatorname{Re}\lambda > \bar{c}(h,\phi)\}$ is always a subset of the resolvent set (see Prop.4.8(a) below). The description of the remainig part $\{\lambda \in \sigma(A) : \underline{c}(h,\phi) \leq \operatorname{Re}\lambda \leq \bar{c}(h,\phi)\}$ is more difficult. First we discuss some examples and then give a partial answer to this problem (see Prop.4.8(b)-(e)).